



1407 W. North Temple
Salt Lake City, Utah 84116

September 20, 2021

VIA ELECTRONIC FILING

Public Service Commission of Utah
Heber M. Wells Building, 4th Floor
160 East 300 South
Salt Lake City, UT 84114

Attn: Gary Widerburg
Commission Secretary

Re: **Docket No. 03-035-14 – Quarterly Compliance Filing – 2021.Q2 Avoided Cost Input Changes**
Docket No. 21-035-44 – 2021.Q2 Avoided Cost Input Changes Quarterly Compliance Filing

PacifiCorp (dba Rocky Mountain Power) hereby respectfully submits its quarterly Schedule 38 compliance filing.

Public Service Commission of Utah (Commission) orders dated October 31, 2005, and February 2, 2006, in Docket No. 03-035-14 require the Company to keep a record of any changes, including data inputs, made to the Proxy model and the Generation and Regulation Initiative Decision Tool (GRID) model used in calculating avoided costs. The orders further require the Company to notify the Commission and Division of Public Utilities (DPU) of updates made to the models used in the approved Proxy and Partial Displacement Differential Revenue Requirement (PDDRR) avoided cost methodologies. The Commission order dated June 9, 2015 in Docket No. 14-035-140 requires the Company to identify routine and non-routine updates or modeling changes. Non-routine updates will become effective in three weeks if the update is unchallenged by any party or upon resolution by settlement or Commission action if challenged by any party.

Routine Updates

Appendix A provides a summary of the assumptions used within the GRID model. The Company identifies the following routine updates to its avoided cost inputs since the previous filing:

1. **Official Forward Price Curve (OFPC)**
Update to prices dated June 30, 2021 (2106 OFPC).
2. **Load Forecast**
Update to Company's most recent load forecast dated August 10, 2021.

3. **Qualifying Facility (QF) Queue**

Update of signed contract queue and current potential QFs. The QF queue was revised to include 1,164 MW nameplate in this filing. The potential queue was 2,665 MW nameplate in the 2021.Q1 filing.

Additional Details

Additional detail is provided below:

1. **Proxy / Partial Displacement Differential Revenue Requirement (PDDRR) Avoided Cost Methodology** – The proxy resources used in the PDDRR avoided cost methodology are consistent with the Company’s 2019 Integrated Resource Plan (IRP) filed with the Commission on October 18, 2019. The 2019 IRP preferred portfolio includes cost-effective solar with storage, wind, wind with storage, stand storage and thermal resources. The thermal QF resource partially displaces summer and winter front office transactions (FOT) during 2022-2025, and the Naughton simple-cycle combustion turbine in 2026. The tracking solar QF resource partially displaces summer and winter FOTs during 2022-2023 and the Southern Oregon solar with storage resource in 2024. The wind QF resource partially displaces summer and winter FOTs during 2022 and a Utah wind proxy in 2023, in accordance with the Commission’s August 20, 2020 order in Docket No. 19-035-18.
2. **Impact to Avoided Cost Prices (\$/MWh)** – Provided as **Appendix B.1** is the \$/MWh impact of the above mentioned updates on avoided costs, compared to the previous compliance filing.
 - a. Avoided costs presented in **Appendix B.1** were calculated assuming a 100 MW 100 percent capacity factor thermal QF resource.
 - b. Avoided costs presented in **Appendix B.2** were calculated assuming an 80 MW 32.3 percent capacity factor single-axis tracking solar QF resource.
 - c. Avoided costs presented in **Appendix B.3** were calculated assuming an 80 MW 29.4 percent capacity factor wind QF resource.
3. **Major Changes from the Prior Study** – Provided as **Appendix C** is a \$/MWh step impact study of the routine updates from the prior study. Also provided in **Appendix C** is the incremental impact of each change from the prior step.

Work Papers

The Company has also provided calculations with additional details on the following:

- Current QF queue and partial displacement adjusted for solar degradation; and
- FOT partial displacement

Public Service Commission of Utah

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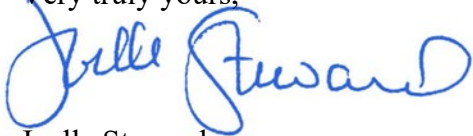
It is respectfully requested that all formal correspondence and requests regarding this compliance filing be addressed to:

By E-Mail (preferred): datarequest@pacificorp.com

By Regular Mail: Data Request Response Center
PacifiCorp
825 NE Multnomah Street, Suite 2000
Portland, OR 97232

Informal inquiries may be made to Jana Saba at (801) 220-2823, or Dan MacNeil at (503) 813-5523.

Very truly yours,



Joelle Steward

Vice President, Regulation

cc: Service List (Docket No. 03-035-14)
Service List (Docket No. 21-035-44)

ROCKY MOUNTAIN POWER
DESCRIPTION OF AVOIDED COST INPUT CHANGES
2021.Q2 – SEPTEMBER 2021

Appendix A

PacifiCorp Avoided Cost (Partial Displacement Differential Revenue Requirement (“PDDRR”)) Model Updates through September 2021 Docket No. 21-035-44 / Docket No. 03-035-14

Assumptions that have changed since the 2021.Q1 compliance filing are in **bold and underline**.

GRID Scenario Study Period

- January 1, **2022** through December 31, **2036** - 15-year study.
- Avoided cost prices starting in January **2022**.

Official Forward Price Curve (“OFPC”) (Gas and Electric Market Prices)

- **Updated to PacifiCorp’s June 30, 2021 OFPC (“2106 OFPC”)**
- Hourly Market Price Scalars consistent with 2019 Integrated Resource Plan (“IRP”)

Fuel Prices (Coal)

- Average and incremental coal costs based on forecast dated August 2020.
- Coal burn expense reflects incremental coal costs and coal take or pay minimum burn levels.

IRP Resources

- 2019 IRP filed with the Public Service Commission of Utah (“UPSC”) on October 18, 2019.
- New solar, wind, battery storage, and thermal resources; as well as front office transactions (“FOT”), consistent with 2019 IRP (2019 IRP, Vol 1, Chapter 8).
- Existing plant retirement consistent with 2019 IRP (2019 IRP, Vol 1, Chapter 8).
- Transmission investment and capacity changes consistent with 2019 IRP (2019 IRP, Vol 1, Table 8.16).

REC Ownership:

Consistent with the Commission’s January 23, 2018 order in Docket No. 17-035-37, when a QF defers or avoids a renewable resource, the Company retains the renewable energy credits (“RECs”) on behalf of ratepayers. When a QF’s avoided capacity costs are not based on the costs of a renewable resource, the QF is entitled to the RECs associated with its output.

Hydro Resources

- Hydro forecast prepared **April 2021**.
- 2020 hydro levels extended thereafter with known and measurable changes.
- Adjust Klamath dispatch to reflect current operating patterns.

- Update Mid-Columbia (“Mid-C”) generation forecast.

Discount Rate

- 6.92 percent discount rate - 2019 IRP
- Discount rate is consistent with the Commission’s order in Docket 11-035-T06.

Inflation Rates

- Company’s inflation rate forecast dated June 30, 2021.

Levelized Prices (Nominal) at 6.92 percent Discount Rate

- 15 years 2022 through 2036.
- Levelized prices are for illustrative purposes only.

Load Forecast (Retail)

- 20-year load forecast dated August 10, 2021.

Long-Term Contracts

- Long-term contracts which have prices that are indexed to market are consistent with the 2106 OFPC.
- Contracts are modeled based on 48 months ended December 2019.
- Qualifying Facility (QF) power purchase agreements (PPA) are assumed to terminate and not renew at the end of their current PPA term.
- Incorporates signed PPAs.

Market Capacity

- Capacity set at 48-month average of all short-term firm (“STF”) sales ended June 2021.
- Mid-C and Palo Verde (“PV”) markets uncapped.
- Additional heavy load hour (“HLH”) and light load hour (“LLH”) sales limited to historical 48-month average less monthly executed STF contracts as of June 2021.

Potential Environmental Costs

- Potential environmental costs are excluded from fuel cost for net power costs (“NPC”) and plant commitment and dispatch decisions.

Regulating Margin

- Requirements are modeled based on the 2019 IRP Flexible Reserve Study.

- Regulation reserve requirements are modified to account for the incremental integration costs specific to the QF and preferred portfolio displacement being evaluated, consistent with the methodology used in the 2019 IRP.

Contingency Reserve Calculation

- Reserve modeling reflects the North American Electric Reliability Corporation / Western Electricity Coordinating Council reliability standard BAL-002-WECC-2 – contingency reserves set to 3 percent of retail load plus 3 percent of generating resources.
- Hourly retail load reserve calculation through 2022.
- Typical week retail load reserve calculation thereafter.

STF Transactions

- Executed STF contracts as of June 2021.

Size of the Avoided Cost Resource

- The avoided cost thermal resource is 100 megawatts (“MW”) with a 100 percent capacity factor and is located in the Utah North transmission bubble.
- The avoided cost tracking solar resource is 80 MW with a 32.3 percent capacity factor and is located in the Utah North transmission bubble.
- The avoided cost wind resource is 80 MW with a 29.4 percent capacity factor and is located in the Utah North transmission bubble.

Thermal Resources

- Thermal resource operating characteristics updated to be consistent with current Company official characteristics.
- Forced outage, planned outage, and heat rate levels based on 48 months ended December 2019.

Wind and Solar Resources

- Existing wind and solar generation profiles modeled using 2018 actual generation shape.¹
- Wind and solar generation shaped to hourly using 2018 actual generation shape.¹
- Non-PTC wind resources that are located in a constrained area and can be curtailed on an economic basis are dispatched within the GRID model.²
- Resource-specific capacity contribution values are calculated for proxy resources and QFs, based on their expected output and the final loss of load probability results in the 2019 IRP.

¹ Starting in the 2013.Q4 Compliance filing, wind generation has been modeled hourly using actual generation shape. Potential resources were also modeled hourly when data was provided by the project developer. Since the 2016.Q4 compliance filing, all potential wind generation profiles have been shaped to an hourly profile using the hourly shape of nearby wind resources. Shaping does not alter the 12x24 wind generation profile. This change was made to make potential wind modeling more consistent with existing wind modeling. The hourly shaping of solar generation was identified as a non-routine change in the 2018.Q2 compliance filing.

² Wind dispatch was identified as a non-routine change in the 2018.Q2 compliance filing.

Transmission

- Short-term transmission modeled based on 48 months ended December 2020.
- Transmission investment and capacity changes consistent with 2019 IRP (2019 IRP, Vol 1, Table 8.16).

IRP Partial Displacements (This Filing)

Provided in the table below are the Contracts that have executed a PPA or are actively negotiating for a PPA. Signed resources are new and were not included in the 2019 IRP.

Contracts Queue					
No.	Signed Contracts	Partial Displacement	Name plate	Capacity Contribution	Start Date
1	Cypress Creek Renewables - Merri	-1.5	-10.0	14.9%	2020 01 01
2	OR Solar 7, LLC (Jacksonville)	-1.5	-10.0	14.9%	2020 01 01
3	Graphite Solar I	5.7	80.0	7.1%	2022 01 01
4	Mariah Wind	-5.8	-10.0	57.5%	2020 01 01
5	Orem Family wind	-5.8	-10.0	57.5%	2020 01 01
6	Horseshoe Solar	6.2	75.0	8.3%	2022 11 01
7	Rocket Solar	6.6	80.0	8.2%	2022 11 01
8	Skysol Solar QF	6.4	55.0	11.6%	2023 03 01
9	Appaloosa Solar I-A	8.5	120.0	7.1%	2023 10 01
10	Appaloosa Solar I-B	5.7	80.0	7.1%	2023 10 01
11	Birch Creek Hydro QF PPA (pendin	1.4	2.7	53.1%	2022 04 01
12	Fall Creek Rural Electric Co-op QF	4.0	7.5	53.1%	2021 04 01
13	Captain Jack Solar QF PPA	0.4	2.7	14.8%	2021 10 01
14	Elektron Solar PPA 1	1.0	10.2	10.0%	2022 12 31
15	Elektron Solar PPA 2	6.9	69.8	9.9%	2022 12 31
16	Castle Solar, LLC, PPA	2.0	20.0	10.0%	2021 12 31
17	Tesoro Non Firm	0.0	25.0	0.0%	2021 01 01
18	Kennecott Smelter Non Firm	0.0	31.8	0.0%	2021 01 01
19	Kennecott Refinery Non Firm	0.0	6.2	0.0%	2021 01 01
20	Exxon Mobil	0.0	98.0	0.0%	2020 01 01
21	US MagCorp Non-Firm	0.0	36.0	0.0%	2021 01 01
22	Yakima Tieton Cowiche	0.4	1.47	26.5%	2021 01 01
23	Yakima Tieton Orchard	0.35	1.44	24.3%	2021 01 01

Total Signed MW		40.97	762.71		
No.	Potential QF Contracts	Partial Displacement	Name plate	Capacity Contribution	Start Date
1	QF - 605 - WY - Solar	10.38	80.00	13.0%	2023 10 01
2	QF - 635 - UT - Gas	11.20	11.20	100.0%	2022 03 01
3	QF - 637 - WY - Solar	6.90	74.90	9.2%	2023 11 01
4	QF - 639 - WY - Solar	7.24	74.90	9.7%	2024 01 01
5	QF - 640 - WY - Wind	9.54	79.80	12.0%	2024 08 01
6	QF - 643 - WA - Solar	1.60	80.00	2.0%	2023 12 01
Total Potential MW		46.86	400.80		

Total Partial Displacement		87.83	1163.51		
7	Utah 2021.Q2	100.00	100.0	100.0%	2021 01 01
Partial Displacement after QF		187.83	1263.51		

After accounting for the QF queue, the capacity displacement associated with the proxy avoided cost resources in this filing were as follows:

- Thermal: Incremental Thermal QF resource displaces FOTs for 2022-2025 and Naughton simple cycle combustion turbine in 2026.
- Tracking Solar: **234** nameplate MW of solar resources are displaced by the QF queue. After degradation and accounting for capacity contribution, the incremental solar QF displaces **29MW** of solar with storage resource located in **Utah North** in 2024. The Company retains 100% of the RECs starting in 2024.
- Wind: **13** MW of wind resources are displaced by the QF queue. The incremental wind QF displaces a Utah wind resource in 2023, and the Company retains 100% of the RECs starting in 2023.

Year	Base Case Displacement (Nameplate MW)							
	Thermal	Battery	SolarwB	WindwB	Wind	FOT Summer	FOT Winter	FOT Flat
2019	-	-	-	-	-	-	-	-
2020	-	-	-	-	-	-	-	-
2021	-	-	-	-	-	5	5	-
2022	-	-	16	-	-	18	18	-
2023	-	-	19	-	-	24	24	-
2024	-	-	234	-	-	17	17	-
2025	-	-	234	-	-	27	27	-
2026	18	-	234	-	-	10	10	-
2027	18	-	234	-	-	10	10	-
2028	18	-	234	-	-	10	10	-
2029	18	-	234	13	-	-	-	-
2030	18	-	234	13	-	-	-	-
2031	18	-	234	13	-	-	-	-
2032	18	-	234	13	-	-	-	-
2033	18	-	234	13	-	-	-	-
2034	18	-	234	13	-	-	-	-
2035	18	-	234	13	-	-	-	-
2036	18	-	234	13	-	-	-	-
2037	18	-	234	13	-	-	-	-
2038	18	-	234	13	-	-	-	-

IRP Partial Displacements (Previous Filing)

Total partial displacement was 245.87 MW in the base case and 345.87 MW in the avoided cost case as shown in the table below, adjusted for solar degradation:

Contracts Queue					
No.	Signed Contracts	Partial Displacement	Name plate	Capacity Contribution	Start Date
1	Cypress Creek Renewables - Merrill Solar LLC	-1.5	-10.0	14.9%	2020 01 01
2	OR Solar 7, LLC (Jacksonville)	-1.5	-10.0	14.9%	2020 01 01
3	Graphite Solar I	5.7	80.0	7.1%	2022 01 01
4	Mariah Wind	-5.8	-10.0	57.5%	2020 01 01
5	Orem Family wind	-5.8	-10.0	57.5%	2020 01 01
6	Horseshoe Solar	6.2	75.0	8.3%	2022 11 01
7	Rocket Solar	6.6	80.0	8.2%	2022 11 01
8	Skysol Solar QF	6.4	55.0	11.6%	2023 03 01
9	Appaloosa Solar I-A	8.5	120.0	7.1%	2023 10 01
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11	Birch Creek Hydro QF PPA	1.4	2.7	53.1%	2022 04 01
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16	Castle Solar, LLC, PPA	2.0	20.0	10.0%	2021 12 31
17	Tesoro Non Firm	0.0	25.0	0.0%	2021 01 01
18	Kennecott Smelter Non Firm	0.0	31.8	0.0%	2021 01 01
19	Kennecott Refinery Non Firm	0.0	6.2	0.0%	2021 01 01
20	Exxon Mobil	0.0	98.0	0.0%	2020 01 01
21	US MagCorp Non-Firm	0.0	36.0	0.0%	2021 01 01
22	Yakima Tieton Cowiche	0.4	1.47	26.5%	2021 01 01
23	Yakima Tieton Orchard	0.35	1.44	24.3%	2021 01 01

Total Signed MW	40.97	762.71		
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No.	Potential QF Contracts	Partial Displacement	Name plate	Capacity Contribution	Start Date
1	QF - 561 - WA - Solar	0.10	4.99	2.0%	2023 01 01
2	QF - 602 - OR - Solar	2.07	20.00	10.4%	2023 09 01
3	QF - 442 - WY - Solar	7.09	80.00	8.9%	2024 01 01
4	QF - 603 - WY - Solar	3.09	20.00	15.5%	2024 01 01
5	QF - 604 - WY - Solar	2.59	9.00	28.8%	2024 01 01
6	QF - 544 - OR - Solar	9.65	80.00	12.1%	2024 01 01
7	QF - 537 - WY - Wind	1.73	16.50	10.5%	2021 04 01
8	QF - 605 - WY - Solar	10.38	80.00	13.0%	2023 10 01
9	QF - 606 - UT - Solar	7.09	80.00	8.9%	2024 01 01

10	QF - 607 - UT - Solar	7.09	80.00	8.9%	2024 01 01
11	QF - 610 - UT - Solar	4.04	71.80	5.6%	2021 12 01
9	QF - 611 - UT - Solar	9.31	75.00	12.4%	2024 07 01
10	QF - 612 - UT - Solar	9.16	80.00	11.5%	2024 07 01
11	QF - 613 - UT - Solar	9.12	80.00	11.4%	2024 07 01
12	QF - 614 - UT - Solar	9.29	75.00	12.4%	2024 07 01
13	QF - 615 - UT - Solar	16.25	52.50	31.0%	2023 12 01
14	QF - 616 - UT - Solar	16.25	52.50	31.0%	2023 12 01
15	QF - 617 - UT - Solar	16.25	52.50	31.0%	2023 12 01
16	QF - 618 - UT - Solar	16.25	52.50	31.0%	2023 12 01
17	QF - 619 - UT - Solar	16.25	52.50	31.0%	2023 12 01
18	QF - 620 - UT - Solar	16.25	52.50	31.0%	2023 12 01
19	QF - 621 - UT - Solar	16.25	52.50	31.0%	2023 12 01
20	QF - 622 - UT - Solar	16.25	52.50	31.0%	2023 12 01
21	QF - 623 - UT - Solar	16.25	52.50	31.0%	2023 12 01
22	QF - 624 - UT - Solar	16.25	52.50	31.0%	2023 12 01
23	QF - 625 - UT - Solar	16.25	52.50	31.0%	2023 12 01
24	QF - 626 - UT - Solar	16.25	52.50	31.0%	2023 12 01
25	QF - 627 - UT - Solar	16.25	52.50	31.0%	2023 12 01
26	QF - 628 - UT - Solar	16.25	52.50	31.0%	2023 12 01
27	QF - 629 - UT - Solar	16.25	52.50	31.0%	2023 12 01
28	QF - 630 - UT - Solar	16.25	52.50	31.0%	2023 12 01
29	QF - 631 - UT - Solar	16.25	52.50	31.0%	2023 12 01
30	QF - 632 - UT - Solar	16.25	52.50	31.0%	2023 12 01
31	QF - 633 - UT - Solar	16.25	52.50	31.0%	2023 12 01
32	QF - 634 - UT - Solar	16.25	52.50	31.0%	2023 12 01
Total Potential MW		416.80	1902.29		
Total Partial Displacement		457.77	2665.00		

ROCKY MOUNTAIN POWER

UPDATE IMPACT – UPDATED AVOIDED COST STUDY

2021.Q2 – September 2021

Appendix B.1
Avoided Cost Prices \$/MWh
Utah 2021.Q2 Sch 38

Year	Thermal	Solar Tracking	Wind (Defers UT	Thermal	Solar Tracking	Wind (Defers UT	Thermal	Solar Tracking	Wind (Defers UT
	UT 2021.Q2 100% CF (2)	UT 2021.Q2 31.1% CF (2)	W) UT 2021.Q2 29.4% CF (2)	UT 2021.Q1 100% CF (2)	UT 2021.Q1 31.1% CF (2)	W) UT 2021.Q1 29.4% CF (2)	Difference	Difference	Difference
2022	\$27.92	\$20.86	\$23.30	\$22.83	\$18.24	\$20.89	\$5.08	\$2.62	\$2.42
2023	\$25.61	\$19.19	\$25.75	\$21.80	\$18.52	\$27.41	\$3.82	\$0.67	(\$1.65)
2024	\$17.91	\$15.62	\$27.04	\$16.69	\$12.76	\$27.40	\$1.22	\$2.86	(\$0.36)
2025	\$19.01	\$17.77	\$27.31	\$18.62	\$13.28	\$27.79	\$0.39	\$4.50	(\$0.48)
2026	\$32.49	\$18.79	\$28.51	\$33.08	\$14.08	\$28.83	(\$0.60)	\$4.71	(\$0.31)
2027	\$34.24	\$19.49	\$28.94	\$35.18	\$15.09	\$29.93	(\$0.94)	\$4.40	(\$0.99)
2028	\$37.79	\$21.52	\$30.49	\$38.26	\$19.98	\$32.43	(\$0.47)	\$1.54	(\$1.93)
2029	\$40.93	\$22.59	\$31.33	\$40.68	\$21.37	\$33.39	\$0.25	\$1.22	(\$2.06)
2030	\$39.34	\$20.86	\$31.92	\$40.44	\$19.09	\$33.74	(\$1.10)	\$1.77	(\$1.83)
2031	\$41.16	\$22.21	\$33.32	\$42.52	\$20.88	\$34.70	(\$1.36)	\$1.33	(\$1.38)
2032	\$42.30	\$22.98	\$33.98	\$43.85	\$21.59	\$34.88	(\$1.56)	\$1.40	(\$0.90)
2033	\$43.76	\$23.12	\$61.39	\$45.58	\$22.86	\$62.89	(\$1.82)	\$0.26	(\$1.50)
2034	\$44.86	\$24.17	\$62.64	\$46.68	\$23.94	\$64.11	(\$1.83)	\$0.23	(\$1.47)
2035	\$46.20	\$24.99	\$64.75	\$47.91	\$24.87	\$66.18	(\$1.71)	\$0.12	(\$1.43)
2036	\$48.12	\$26.32	\$65.96	\$50.02	\$27.40	\$67.96	(\$1.91)	(\$1.08)	(\$2.00)

15-Year Levelized Prices (Nominal) @ 6.920% Discount Rate (1) (3)										
2022-2036	\$/MWh	\$33.67	\$20.65	\$34.65	\$33.31	\$18.55	\$35.50	\$0.36	\$2.10	(\$0.85)
							1%	11%		-2%

Footnotes:

- (1) Discount Rate - 2019 IRP
- (2) Total Avoided Costs with Capacity, based on stated CF
- (3) 15-Years: 2022 - 2036, levelized monthly

Table 1
Avoided Cost Prices
Utah 2021.Q2 - 100.0 MW and 100.0% CF

	Total Price @		
Year	Capacity Price \$/kW-yr	Energy Only Price \$/MWh ⁽²⁾	100.0% Capacity Factor \$/MWh
2022	\$0.00	\$27.92	\$27.92
2023	\$0.00	\$25.61	\$25.61
2024	\$0.00	\$17.91	\$17.91
2025	\$0.00	\$19.01	\$19.01
2026	\$115.47	\$19.30	\$32.49
2027	\$118.12	\$20.75	\$34.24
2028	\$120.86	\$24.03	\$37.79
2029	\$123.76	\$26.80	\$40.93
2030	\$126.63	\$24.88	\$39.34
2031	\$129.53	\$26.37	\$41.16
2032	\$132.52	\$27.21	\$42.30
2033	\$135.54	\$28.29	\$43.76
2034	\$138.67	\$29.03	\$44.86
2035	\$141.83	\$30.00	\$46.20
2036	\$145.11	\$31.60	\$48.12
2037	\$148.47	\$33.40	\$50.35

15 Year

Levelized Prices (Nominal) @ 6.92% Discount Rate (1) (3)

	\$/kW	\$80.42		
	\$/MWh		\$24.49	\$33.67

Table 4
Burnertip Natural Gas Price Forecast
Utah 2021.Q2 - 100.0 MW and 100.0% CF

Year	PacifiCorp			
	Delivered IRP - Utah Greenfield Fuel Cost	Delivered Naughton Fuel Cost	Delivered IRP West Side Fuel Cost	Delivered IRP - Wyo NE Fuel Cost
2019	\$2.42	\$2.43	\$4.31	\$2.09
2020	\$1.98	\$1.99	\$2.17	\$1.79
2021	\$3.75	\$3.76	\$3.60	\$6.00
2022	\$3.22	\$3.23	\$3.29	\$2.96
2023	\$2.80	\$2.81	\$2.86	\$2.56
2024	\$2.87	\$2.88	\$2.88	\$2.62
2025	\$3.21	\$3.22	\$3.16	\$2.96
2026	\$3.42	\$3.43	\$3.33	\$3.17
2027	\$3.52	\$3.53	\$3.49	\$3.27
2028	\$3.76	\$3.77	\$3.71	\$3.51
2029	\$4.12	\$4.13	\$4.04	\$3.86
2030	\$4.28	\$4.29	\$4.19	\$4.02
2031	\$4.40	\$4.41	\$4.33	\$4.14
2032	\$4.48	\$4.49	\$4.38	\$4.22
2033	\$4.73	\$4.74	\$4.58	\$4.47
2034	\$4.79	\$4.80	\$4.61	\$4.53
2035	\$4.86	\$4.87	\$4.63	\$4.60
2036	\$4.97	\$4.98	\$4.70	\$4.71
2037	\$5.07	\$5.08	\$4.83	\$4.81
2038	\$5.26	\$5.27	\$4.93	\$4.99
2039	\$5.56	\$5.57	\$5.19	\$5.29
2040	\$5.90	\$5.91	\$5.43	\$5.63

Official Forward Price Curve Forecast dated Jun 30, 2021

Table 5

**Utah 2021.Q2 - 100.0 MW and 100.0% CF
January 2022 through December 2036
Nominal Avoided Costs Calculated Monthly**

Nominal NPV at 6.92% Discount Rate

15 Year \$ 202,626,443 \$ 75,967,062 \$ 278,593,505 8,274,875 \$33.67

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	100.0% CF	Dollars	MWH	100.0% CF
Jan-22	2,751,498	-	2,751,498	74,400	36.98
Feb-22	1,706,370	-	1,706,370	67,200	25.39
Mar-22	1,611,425	-	1,611,425	74,400	21.66
Apr-22	1,221,873	-	1,221,873	72,000	16.97
May-22	1,210,813	-	1,210,813	74,400	16.27
Jun-22	1,516,786	-	1,516,786	72,000	21.07
Jul-22	4,414,059	-	4,414,059	74,400	59.33
Aug-22	3,267,768	-	3,267,768	74,400	43.92
Sep-22	2,059,453	-	2,059,453	72,000	28.60
Oct-22	1,460,605	-	1,460,605	74,400	19.63
Nov-22	1,476,744	-	1,476,744	72,000	20.51
Dec-22	1,756,514	-	1,756,514	74,400	23.61
Jan-36	2,670,612	1,209,285	3,879,897	74,400	52.15
Feb-36	2,345,569	1,209,285	3,554,854	69,600	51.08
Mar-36	1,999,788	1,209,285	3,209,073	74,400	43.13
Apr-36	1,430,499	1,209,285	2,639,784	72,000	36.66
May-36	1,201,662	1,209,285	2,410,948	74,400	32.41
Jun-36	1,710,459	1,209,285	2,919,744	72,000	40.55
Jul-36	2,765,286	1,209,285	3,974,571	74,400	53.42
Aug-36	2,915,884	1,209,285	4,125,169	74,400	55.45
Sep-36	2,821,946	1,209,285	4,031,231	72,000	55.99
Oct-36	2,435,852	1,209,285	3,645,137	74,400	48.99
Nov-36	2,371,645	1,209,285	3,580,930	72,000	49.74
Dec-36	3,084,119	1,209,285	4,293,404	74,400	57.71

Table 3
2019 IRP SCCT Resource Costs
Naughton - 185 MW - SCCT Frame "F" x1 - East Side Resource (6,050')

Year	Estimated Capital Cost	Fixed Capital Cost at Real Levelized	Fixed O&M	Variable O&M	Total O&M at Expected CF	Total Resource Fixed Costs	Fuel Cost	Total Resource Energy Cost	Total Resource Costs	Total Fixed Cost
	\$/kW	\$/kW-yr	\$/kW-yr	\$/MWh	\$/kW-yr	\$/kW-yr	\$/MMBtu	\$/MWh	\$/MWh	\$/kW-yr
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(i)

Naughton - 185 MW - SCCT Frame "F" x1 - East Side Resource (6,050')

2016										
2017										\$0.00
2018				\$7.76						\$7.76
2019				\$7.90						\$7.90
2020				\$7.99						\$7.99
2021				\$8.25						\$8.25
2022				\$8.43						\$8.43
2023				\$8.61						\$8.61
2024				\$8.80						\$8.80
2025				\$9.00						\$9.00
2026	\$719	\$50.01	\$38.05	\$9.21	\$64.68	\$114.69	\$3.43	\$33.57	\$73.24	\$111.94
2027		\$51.16	\$38.93	\$9.42	\$66.16	\$117.32	\$3.53	\$34.54	\$75.12	\$114.51
2028		\$52.34	\$39.83	\$9.64	\$67.70	\$120.04	\$3.77	\$36.89	\$78.41	\$117.17
2029		\$53.60	\$40.79	\$9.87	\$69.32	\$122.92	\$4.13	\$40.42	\$82.94	\$119.98
2030		\$54.83	\$41.73	\$10.10	\$70.93	\$125.76	\$4.29	\$41.98	\$85.48	\$122.76
2031		\$56.09	\$42.69	\$10.33	\$72.55	\$128.64	\$4.41	\$43.16	\$87.66	\$125.57
2032		\$57.38	\$43.67	\$10.57	\$74.23	\$131.61	\$4.49	\$43.94	\$89.47	\$128.47
2033		\$58.70	\$44.67	\$10.81	\$75.92	\$134.62	\$4.74	\$46.39	\$92.96	\$131.40
2034		\$60.05	\$45.70	\$11.06	\$77.67	\$137.72	\$4.80	\$46.97	\$94.61	\$134.43
2035		\$61.43	\$46.75	\$11.31	\$79.44	\$140.87	\$4.87	\$47.66	\$96.39	\$137.50
2036		\$62.84	\$47.83	\$11.57	\$81.28	\$144.12	\$4.98	\$48.73	\$98.58	\$140.68
2037		\$64.29	\$48.93	\$11.84	\$83.16	\$147.45	\$5.08	\$49.71	\$100.72	\$143.93
2038		\$65.77	\$50.06	\$12.11	\$85.07	\$150.84	\$5.27	\$51.57	\$103.75	\$147.24
2039		\$67.28	\$51.21	\$12.39	\$87.03	\$154.31	\$5.57	\$54.51	\$107.89	\$150.63
2040		\$68.83	\$52.39	\$12.67	\$89.02	\$157.85	\$5.91	\$57.84	\$112.44	\$154.08
2041		\$70.34	\$53.54	\$12.95	\$90.98	\$161.32	\$6.04	\$59.11	\$114.91	\$157.47
2042		\$71.89	\$54.72	\$13.23	\$92.97	\$164.86	\$6.17	\$60.38	\$117.41	\$160.92

Sources, Inputs and Assumptions

- Source: (a)(c)(d) Plant Costs - 2019 IRP - Table 6.1 & 6.2
- (b) = (a) x 0.0695884915153164
 - (e) = (d) x (8.76 x 33.0%) + (c)
 - (f) = (b) + (e)
 - (g) Table 4 - Burnertip Natural Gas Price Forecast
 - (h) = 9,786 MMBtu/MWh x \$/MMBtu
 - (i) = (f) / (8.76 x 'Capacity Factor') + (h)

Table 3
2019 IRP SCCT Resource Costs
Naughton - 185 MW - SCCT Frame "F" x1 - East Side Resource (6,050')

Naughton - 185 MW - SCCT Frame "F" x1 - East Side Resource (6,050')
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CCCT Statistics	MW	Percent	Cap Cost	Fixed
SCCT Dry "F" - Turbine	185	100.0%	\$745	\$31.91
	-	0.0%	\$0	\$0.00
Capacity Weighted	185	100.0%	\$745	\$31.91

CCCT Statistics	MW	CF	aMW	Percent	Variable	Heat Rate
SCCT Dry "F" - Turbine	185	33.0%	61.1	100.0%	\$7.76	9,786
	-	0.0%	-	0.0%	-	-
Energy Weighted	185	33.0%	61.1	100.0%	\$7.76	9,786

Rounded

SCCT	Duct Firing	Plant Costs - 2019 IRP - Table 6.1 & 6.2
		MW Plant Capacity
2018 \$		Plant Capacity Cost
2018 \$		Fixed O&M & Capitalized O&M
2018 \$		Fixed Pipeline
2018 \$		Fixed O&M Including Fixed Pipeline & Capitalized O&M (\$/kW-Yr)
2018 \$		Variable O&M Costs & Capitalized Variable O&M (\$/MWh)
		Heat Rate in btu/kWh
		Payment Factor
		Capacity Factor
	33.0%	Energy Weighted Capacity Factor

Company Official Inflation Forecast Dated June 30, 2021
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2017	2.0%	2026	2.3%	2035	2.3%
2018	2.4%	2027	2.3%	2036	2.3%
2019	1.8%	2028	2.3%	2037	2.3%
2020	1.2%	2029	2.4%	2038	2.3%
2021	3.2%	2030	2.3%	2039	2.3%
2022	2.2%	2031	2.3%	2040	2.3%
2023	2.1%	2032	2.3%	2041	2.2%
2024	2.2%	2033	2.3%	2042	2.2%
2025	2.3%	2034	2.3%	2043	2.3%

Appendix B.2
Avoided Cost Prices \$/MWh
Utah 2021.Q2 Sch 38

Year	Thermal	Solar Tracking	Wind (Defers UT	Thermal	Solar Tracking	Wind (Defers UT	Thermal	Solar Tracking	Wind (Defers UT
	UT 2021.Q2 100% CF (2)	UT 2021.Q2 31.1% CF (2)	W) UT 2021.Q2 29.4% CF (2)	UT 2021.Q1 100% CF (2)	UT 2021.Q1 31.1% CF (2)	W) UT 2021.Q1 29.4% CF (2)	Difference	Difference	Difference
2022	\$27.92	\$20.86	\$23.30	\$22.83	\$18.24	\$20.89	\$5.08	\$2.62	\$2.42
2023	\$25.61	\$19.19	\$25.75	\$21.80	\$18.52	\$27.41	\$3.82	\$0.67	(\$1.65)
2024	\$17.91	\$15.62	\$27.04	\$16.69	\$12.76	\$27.40	\$1.22	\$2.86	(\$0.36)
2025	\$19.01	\$17.77	\$27.31	\$18.62	\$13.28	\$27.79	\$0.39	\$4.50	(\$0.48)
2026	\$32.49	\$18.79	\$28.51	\$33.08	\$14.08	\$28.83	(\$0.60)	\$4.71	(\$0.31)
2027	\$34.24	\$19.49	\$28.94	\$35.18	\$15.09	\$29.93	(\$0.94)	\$4.40	(\$0.99)
2028	\$37.79	\$21.52	\$30.49	\$38.26	\$19.98	\$32.43	(\$0.47)	\$1.54	(\$1.93)
2029	\$40.93	\$22.59	\$31.33	\$40.68	\$21.37	\$33.39	\$0.25	\$1.22	(\$2.06)
2030	\$39.34	\$20.86	\$31.92	\$40.44	\$19.09	\$33.74	(\$1.10)	\$1.77	(\$1.83)
2031	\$41.16	\$22.21	\$33.32	\$42.52	\$20.88	\$34.70	(\$1.36)	\$1.33	(\$1.38)
2032	\$42.30	\$22.98	\$33.98	\$43.85	\$21.59	\$34.88	(\$1.56)	\$1.40	(\$0.90)
2033	\$43.76	\$23.12	\$61.39	\$45.58	\$22.86	\$62.89	(\$1.82)	\$0.26	(\$1.50)
2034	\$44.86	\$24.17	\$62.64	\$46.68	\$23.94	\$64.11	(\$1.83)	\$0.23	(\$1.47)
2035	\$46.20	\$24.99	\$64.75	\$47.91	\$24.87	\$66.18	(\$1.71)	\$0.12	(\$1.43)
2036	\$48.12	\$26.32	\$65.96	\$50.02	\$27.40	\$67.96	(\$1.91)	(\$1.08)	(\$2.00)

15-Year Levelized Prices (Nominal) @ 6.920% Discount Rate (1) (3)										
2022-2036	\$/MWh	\$33.67	\$20.65	\$34.65	\$33.31	\$18.55	\$35.50	\$0.36	\$2.10	(\$0.85)
							1%	11%	-2%	

Footnotes:

- (1) Discount Rate - 2019 IRP
- (2) Total Avoided Costs with Capacity, based on stated CF
- (3) 15-Years: 2022 - 2036, levelized monthly

Table 1
Avoided Cost Prices
Utah 2021.Q2_Solar - 80.0 MW and 32.0% CF

Total Price @

Year	Capacity Price \$/kW-yr	Energy Only Price \$/MWh ⁽²⁾	32.0% Capacity Factor \$/MWh
2022	\$0.00	\$20.86	\$20.86
2023	\$0.00	\$19.19	\$19.19
2024	\$33.34	\$3.65	\$15.62
2025	\$34.10	\$5.43	\$17.77
2026	\$34.89	\$6.10	\$18.79
2027	\$35.69	\$6.45	\$19.49
2028	\$36.51	\$8.14	\$21.52
2029	\$37.39	\$8.79	\$22.59
2030	\$38.25	\$6.67	\$20.86
2031	\$39.13	\$7.61	\$22.21
2032	\$40.03	\$8.02	\$22.98
2033	\$40.95	\$7.69	\$23.12
2034	\$41.89	\$8.32	\$24.17
2035	\$42.86	\$8.68	\$24.99
2036	\$43.84	\$9.60	\$26.32
2037	\$44.85	\$10.30	\$27.54

15 Year

Levelized Prices (Nominal) @ 6.92% Discount Rate (1) (3)

\$/kW	\$30.99		
\$/MWh		\$9.60	\$20.65

Table 4
Burnertip Natural Gas Price Forecast
Utah 2021.Q2_Solar - 80.0 MW and 32.0% CF

Year	PacifiCorp			
	Delivered IRP - Utah Greenfield Fuel Cost	Delivered Naughton Fuel Cost	Delivered IRP West Side Fuel Cost	Delivered IRP - Wyo NE Fuel Cost
2019	\$2.42	\$2.43	\$4.31	\$2.09
2020	\$1.98	\$1.99	\$2.17	\$1.79
2021	\$3.75	\$3.76	\$3.60	\$6.00
2022	\$3.22	\$3.23	\$3.29	\$2.96
2023	\$2.80	\$2.81	\$2.86	\$2.56
2024	\$2.87	\$2.88	\$2.88	\$2.62
2025	\$3.21	\$3.22	\$3.16	\$2.96
2026	\$3.42	\$3.43	\$3.33	\$3.17
2027	\$3.52	\$3.53	\$3.49	\$3.27
2028	\$3.76	\$3.77	\$3.71	\$3.51
2029	\$4.12	\$4.13	\$4.04	\$3.86
2030	\$4.28	\$4.29	\$4.19	\$4.02
2031	\$4.40	\$4.41	\$4.33	\$4.14
2032	\$4.48	\$4.49	\$4.38	\$4.22
2033	\$4.73	\$4.74	\$4.58	\$4.47
2034	\$4.79	\$4.80	\$4.61	\$4.53
2035	\$4.86	\$4.87	\$4.63	\$4.60
2036	\$4.97	\$4.98	\$4.70	\$4.71
2037	\$5.07	\$5.08	\$4.83	\$4.81
2038	\$5.26	\$5.27	\$4.93	\$4.99
2039	\$5.56	\$5.57	\$5.19	\$5.29
2040	\$5.90	\$5.91	\$5.43	\$5.63

Official Forward Price Curve Forecast dated Jun 30, 2021

Table 5

**Utah 2021.Q2_Solar - 80.0 MW and 32.0% CF
January 2022 through December 2036
Nominal Avoided Costs Calculated Monthly**

Nominal NPV at 6.92% Discount Rate

15 Year \$ 19,789,248 \$ 22,763,855 \$ 42,553,103 2,060,867 \$20.65

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	31.6% CF	Dollars	MWH	31.6% CF
Jan-22	317,670	-	317,670	12,392	25.64
Feb-22	203,068	-	203,068	12,086	16.80
Mar-22	296,237	-	296,237	16,850	17.58
Apr-22	291,709	-	291,709	19,973	14.61
May-22	408,199	-	408,199	27,333	14.93
Jun-22	456,867	-	456,867	25,042	18.24
Jul-22	866,511	-	866,511	25,543	33.92
Aug-22	699,346	-	699,346	22,926	30.50
Sep-22	443,317	-	443,317	21,875	20.27
Oct-22	312,161	-	312,161	18,278	17.08
Nov-22	214,085	-	214,085	12,918	16.57
Dec-22	173,527	-	173,527	9,233	18.80
Jan-36	148,436	292,297	440,734	11,552	38.15
Feb-36	121,573	292,297	413,871	11,831	34.98
Mar-36	153,277	292,297	445,574	15,708	28.37
Apr-36	87,138	292,297	379,435	18,619	20.38
May-36	59,667	292,297	351,964	25,480	13.81
Jun-36	165,337	292,297	457,634	23,344	19.60
Jul-36	327,856	292,297	620,153	23,812	26.04
Aug-36	314,738	292,297	607,036	21,372	28.40
Sep-36	208,106	292,297	500,403	20,393	24.54
Oct-36	157,764	292,297	450,062	17,039	26.41
Nov-36	163,723	292,297	456,020	12,042	37.87
Dec-36	106,005	292,297	398,302	8,607	46.28

**Table 3
2019 IRP Utah North Solar with Storage
30% Capacity Factor**

Year	Estimated Capital Cost	Fixed Capital Cost at Real Levelized Rate	Fixed O&M	Network Upgrade	Fixed Costs	Variable O&M	Total Resource Cost	Total Resource Costs	Total Fixed Cost
	\$/kW	\$/kW-yr	\$/kW-yr	\$/kW-yr	\$/MWh	\$/MWh	\$/MWh	\$/kW-yr	\$/kW-yr
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
2016									
2017									
2018			\$24.57			\$0.00			\$24.57
2019			\$25.01			\$0.00			\$25.01
2020			\$25.31			\$0.00			\$25.31
2021			\$26.12			\$0.00			\$26.12
2022			\$26.69			\$0.00			\$26.69
2023			\$27.25			\$0.00			\$27.25
2024	\$1,230	\$62.55	\$27.85	\$2.58	\$35.26	\$0.00	\$35.26	\$92.98	\$92.98
2025		\$63.99	\$28.49	\$2.64	\$36.07	\$0.00	\$36.07	\$95.12	\$95.12
2026		\$65.46	\$29.15	\$2.70	\$36.91	\$0.00	\$36.91	\$97.31	\$97.31
2027		\$66.97	\$29.82	\$2.76	\$37.75	\$0.00	\$37.75	\$99.55	\$99.55
2028		\$68.51	\$30.51	\$2.82	\$38.62	\$0.00	\$38.62	\$101.84	\$101.84
2029		\$70.15	\$31.24	\$2.89	\$39.55	\$0.00	\$39.55	\$104.28	\$104.28
2030		\$71.76	\$31.96	\$2.96	\$40.46	\$0.00	\$40.46	\$106.68	\$106.68
2031		\$73.41	\$32.70	\$3.03	\$41.39	\$0.00	\$41.39	\$109.14	\$109.14
2032		\$75.10	\$33.45	\$3.10	\$42.34	\$0.00	\$42.34	\$111.65	\$111.65
2033		\$76.83	\$34.22	\$3.17	\$43.32	\$0.00	\$43.32	\$114.22	\$114.22
2034		\$78.60	\$35.01	\$3.24	\$44.32	\$0.00	\$44.32	\$116.85	\$116.85
2035		\$80.41	\$35.82	\$3.31	\$45.34	\$0.00	\$45.34	\$119.54	\$119.54
2036		\$82.26	\$36.64	\$3.39	\$46.38	\$0.00	\$46.38	\$122.29	\$122.29
2037		\$84.15	\$37.48	\$3.47	\$47.44	\$0.00	\$47.44	\$125.10	\$125.10
2038		\$86.09	\$38.34	\$3.55	\$48.54	\$0.00	\$48.54	\$127.98	\$127.98
2039		\$88.07	\$39.22	\$3.63	\$49.65	\$0.00	\$49.65	\$130.92	\$130.92
2040		\$90.10	\$40.12	\$3.71	\$50.79	\$0.00	\$50.79	\$133.93	\$133.93
2041		\$92.08	\$41.00	\$3.79	\$51.91	\$0.00	\$51.91	\$136.87	\$136.87
2042		\$94.11	\$41.90	\$3.87	\$53.05	\$0.00	\$53.05	\$139.88	\$139.88
2043		\$96.27	\$42.86	\$3.96	\$54.27	\$0.00	\$54.27	\$143.09	\$143.09
2044		\$96.27	\$42.86	\$3.96	\$54.27	\$0.00	\$54.27	\$143.09	\$143.09
2045		\$96.27	\$42.86	\$3.96	\$54.27	\$0.00	\$54.27	\$143.09	\$143.09
2046		\$96.27	\$42.86	\$3.96	\$54.27	\$0.00	\$54.27	\$143.09	\$143.09
2047		\$96.27	\$42.86	\$3.96	\$54.27	\$0.00	\$54.27	\$143.09	\$143.09

2019 IRP Utah North Solar with Storage - 30% Capacity Factor

Sources, Inputs and Assumptions

- Source: (c)(f) Plant Costs - 2019 IRP Update - Table 6.1 & 6.2
 (a) Plant capacity cost
 (b) = (a) x 0.05085
 (e) = ((b) + (c)) / (8.76 x 30.1%)
 (g) = (e) + (f)
 (i) Plant Costs - 2019 IRP Update - Table 6.1 & 6.2

2019 IRP Utah North Solar with Storage - 30% Capacity Factor	
Wind	Cost and Input Assumptions
2018 \$	\$1,609 Plant capacity cost
2018 \$	\$24.57 Fixed O&M, plus on-going capital cost
2018 \$	\$0.00 Wheeling (\$/MWh)
	Variable O&M
	Tax Credit \$/MWh
2024\$	2.58 Network Upgrade (\$/kw-yr) Utah N, Transmission Integration First Year real levelized
	5.085% Payment Factor includes 30% ITC
	30.1% Capacity Factor

COD
342.2 MW

Company Official Inflation Forecast Dated June 30, 2021					
2017	2.0%	2026	2.3%	2035	2.3%
2018	2.4%	2027	2.3%	2036	2.3%
2019	1.8%	2028	2.3%	2037	2.3%
2020	1.2%	2029	2.4%	2038	2.3%
2021	3.2%	2030	2.3%	2039	2.3%
2022	2.2%	2031	2.3%	2040	2.3%
2023	2.1%	2032	2.3%	2041	2.2%
2024	2.2%	2033	2.3%	2042	2.2%
2025	2.3%	2034	2.3%	2043	2.3%
				2044	2.2%
				2045	2.3%
				2046	2.3%
				2047	2.3%

Appendix B.3
Avoided Cost Prices \$/MWh
Utah 2021.Q2 Sch 38

Year	Thermal	Solar Tracking	Wind (Defers UT	Thermal	Solar Tracking	Wind (Defers UT	Thermal	Solar Tracking	Wind (Defers UT
	UT 2021.Q2 100% CF (2)	UT 2021.Q2 31.1% CF (2)	W) UT 2021.Q2 29.4% CF (2)	UT 2021.Q1 100% CF (2)	UT 2021.Q1 31.1% CF (2)	W) UT 2021.Q1 29.4% CF (2)	Difference	Difference	Difference
2022	\$27.92	\$20.86	\$23.30	\$22.83	\$18.24	\$20.89	\$5.08	\$2.62	\$2.42
2023	\$25.61	\$19.19	\$25.75	\$21.80	\$18.52	\$27.41	\$3.82	\$0.67	(\$1.65)
2024	\$17.91	\$15.62	\$27.04	\$16.69	\$12.76	\$27.40	\$1.22	\$2.86	(\$0.36)
2025	\$19.01	\$17.77	\$27.31	\$18.62	\$13.28	\$27.79	\$0.39	\$4.50	(\$0.48)
2026	\$32.49	\$18.79	\$28.51	\$33.08	\$14.08	\$28.83	(\$0.60)	\$4.71	(\$0.31)
2027	\$34.24	\$19.49	\$28.94	\$35.18	\$15.09	\$29.93	(\$0.94)	\$4.40	(\$0.99)
2028	\$37.79	\$21.52	\$30.49	\$38.26	\$19.98	\$32.43	(\$0.47)	\$1.54	(\$1.93)
2029	\$40.93	\$22.59	\$31.33	\$40.68	\$21.37	\$33.39	\$0.25	\$1.22	(\$2.06)
2030	\$39.34	\$20.86	\$31.92	\$40.44	\$19.09	\$33.74	(\$1.10)	\$1.77	(\$1.83)
2031	\$41.16	\$22.21	\$33.32	\$42.52	\$20.88	\$34.70	(\$1.36)	\$1.33	(\$1.38)
2032	\$42.30	\$22.98	\$33.98	\$43.85	\$21.59	\$34.88	(\$1.56)	\$1.40	(\$0.90)
2033	\$43.76	\$23.12	\$61.39	\$45.58	\$22.86	\$62.89	(\$1.82)	\$0.26	(\$1.50)
2034	\$44.86	\$24.17	\$62.64	\$46.68	\$23.94	\$64.11	(\$1.83)	\$0.23	(\$1.47)
2035	\$46.20	\$24.99	\$64.75	\$47.91	\$24.87	\$66.18	(\$1.71)	\$0.12	(\$1.43)
2036	\$48.12	\$26.32	\$65.96	\$50.02	\$27.40	\$67.96	(\$1.91)	(\$1.08)	(\$2.00)

15-Year Levelized Prices (Nominal) @ 6.920% Discount Rate (1) (3)										
2022-2036	\$/MWh	\$33.67	\$20.65	\$34.65	\$33.31	\$18.55	\$35.50	\$0.36	\$2.10	(\$0.85)
							1%	11%		-2%

Footnotes:

- (1) Discount Rate - 2019 IRP
- (2) Total Avoided Costs with Capacity, based on stated CF
- (3) 15-Years: 2022 - 2036, levelized monthly

Table 1
Avoided Cost Prices
Utah 2021.Q1_Wind - 80.0 MW and 29.5% CF

Total Price @			
Year	Capacity Price \$/kW-yr	Energy Only Price \$/MWh ⁽²⁾	29.5% Capacity Factor \$/MWh
2022	\$0.00	\$23.30	\$23.30
2023	\$122.85	(\$21.86)	\$25.75
2024	\$125.58	(\$21.59)	\$27.04
2025	\$128.45	(\$22.47)	\$27.31
2026	\$131.40	(\$22.41)	\$28.51
2027	\$134.42	(\$23.15)	\$28.94
2028	\$137.51	(\$22.76)	\$30.49
2029	\$140.78	(\$23.23)	\$31.33
2030	\$144.00	(\$23.89)	\$31.92
2031	\$147.31	(\$23.77)	\$33.32
2032	\$150.69	(\$24.37)	\$33.98
2033	\$154.14	\$1.65	\$61.39
2034	\$157.68	\$1.53	\$62.64
2035	\$161.29	\$2.25	\$64.75
2036	\$164.99	\$2.07	\$65.96
2037	\$168.78	\$1.37	\$66.79

15 Year

Levelized Prices (Nominal) @ 6.92% Discount Rate (1) (3)

\$/kW \$124.80

\$/MWh (\$13.72) \$34.65

Table 4
Burnertip Natural Gas Price Forecast
Utah 2021.Q1_Wind - 80.0 MW and 29.5% CF

Year	PacifiCorp			
	Delivered IRP - Utah Greenfield Fuel Cost	Delivered Naughton Fuel Cost	Delivered IRP West Side Fuel Cost	Delivered IRP - Wyo NE Fuel Cost
2019	\$2.42	\$2.43	\$4.31	\$2.09
2020	\$1.98	\$1.99	\$2.17	\$1.79
2021	\$3.75	\$3.76	\$3.60	\$6.00
2022	\$3.22	\$3.23	\$3.29	\$2.96
2023	\$2.80	\$2.81	\$2.86	\$2.56
2024	\$2.87	\$2.88	\$2.88	\$2.62
2025	\$3.21	\$3.22	\$3.16	\$2.96
2026	\$3.42	\$3.43	\$3.33	\$3.17
2027	\$3.52	\$3.53	\$3.49	\$3.27
2028	\$3.76	\$3.77	\$3.71	\$3.51
2029	\$4.12	\$4.13	\$4.04	\$3.86
2030	\$4.28	\$4.29	\$4.19	\$4.02
2031	\$4.40	\$4.41	\$4.33	\$4.14
2032	\$4.48	\$4.49	\$4.38	\$4.22
2033	\$4.73	\$4.74	\$4.58	\$4.47
2034	\$4.79	\$4.80	\$4.61	\$4.53
2035	\$4.86	\$4.87	\$4.63	\$4.60
2036	\$4.97	\$4.98	\$4.70	\$4.71
2037	\$5.07	\$5.08	\$4.83	\$4.81
2038	\$5.26	\$5.27	\$4.93	\$4.99
2039	\$5.56	\$5.57	\$5.19	\$5.29
2040	\$5.90	\$5.91	\$5.43	\$5.63

Official Forward Price Curve Forecast dated Jun 30, 2021

Table 5

**Utah 2021.Q1_Wind - 80.0 MW and 29.5% CF
January 2022 through December 2036
Nominal Avoided Costs Calculated Monthly**

Nominal NPV at 6.92% Discount Rate

15 Year \$ (26,820,134) \$ 94,578,999 \$ 67,758,865 1,955,512 \$34.65

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	29.4% CF	Dollars	MWH	29.4% CF
Jan-22	679,272	-	679,272	21,103	32.19
Feb-22	457,999	-	457,999	19,989	22.91
Mar-22	528,895	-	528,895	25,354	20.86
Apr-22	321,074	-	321,074	20,477	15.68
May-22	314,845	-	314,845	20,492	15.36
Jun-22	328,444	-	328,444	16,540	19.86
Jul-22	542,051	-	542,051	12,030	45.06
Aug-22	302,646	-	302,646	9,611	31.49
Sep-22	307,767	-	307,767	12,512	24.60
Oct-22	329,737	-	329,737	17,535	18.80
Nov-22	315,890	-	315,890	15,352	20.58
Dec-22	382,060	-	382,060	15,433	24.76
Jan-36	22,076	1,099,955	1,122,030	21,103	53.17
Feb-36	24,965	1,099,955	1,124,920	20,152	55.82
Mar-36	17,989	1,099,955	1,117,944	25,354	44.09
Apr-36	6,039	1,099,955	1,105,994	20,477	54.01
May-36	(10)	1,099,955	1,099,945	20,492	53.68
Jun-36	1,560	1,099,955	1,101,514	16,540	66.60
Jul-36	97,348	1,099,955	1,197,303	12,030	99.53
Aug-36	96,112	1,099,955	1,196,066	9,611	124.44
Sep-36	64,048	1,099,955	1,164,003	12,512	93.03
Oct-36	25,753	1,099,955	1,125,708	17,535	64.20
Nov-36	12,525	1,099,955	1,112,480	15,352	72.46
Dec-36	58,340	1,099,955	1,158,295	15,433	75.05

**Table 3
2019 IRP Utah Wind Resource
30% Capacity Factor**

Year	Estimated Capital Cost	Fixed Capital Cost at Real Levelized Rate	Fixed O&M	Network Upgrade	Fixed Costs	PTC & Variable O&M	Total Resource Cost	Total Resource Costs	Total Fixed Cost
	\$/kW	\$/kW-yr	\$/kW-yr	\$/kW-yr	\$/MWh	\$/MWh	\$/MWh	\$/kW-yr	\$/kW-yr
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)

2019 IRP Utah Wind Resource - 30% Capacity Factor

2016									
2017									
2018						\$0.00			\$0.00
2019						\$0.00			\$0.00
2020						\$0.00			\$0.00
2021						\$0.00			\$0.00
2022						\$0.00			\$0.00
2023	\$1,266	\$87.31	\$32.33	1.47	\$46.87	(\$21.48)	\$25.39	\$65.60	\$121.11
2024		\$89.23	\$33.07	\$1.50	\$47.91	(\$21.48)	\$26.43	\$68.29	\$123.80
2025		\$91.28	\$33.83	\$1.53	\$49.00	(\$22.28)	\$26.73	\$69.07	\$126.64
2026		\$93.38	\$34.59	\$1.57	\$50.13	(\$22.28)	\$27.85	\$71.97	\$129.54
2027		\$95.53	\$35.38	\$1.61	\$51.28	(\$23.07)	\$28.21	\$72.90	\$132.52
2028		\$97.73	\$36.19	\$1.65	\$52.46	(\$23.07)	\$29.39	\$75.95	\$135.57
2029		\$100.08	\$37.01	\$1.69	\$53.71	(\$23.87)	\$29.84	\$77.10	\$138.78
2030		\$102.38	\$37.86	\$1.73	\$54.94	(\$24.67)	\$30.27	\$78.22	\$141.97
2031		\$104.73	\$38.72	\$1.77	\$56.20	(\$24.67)	\$31.53	\$81.48	\$145.22
2032		\$107.14	\$39.61	\$1.81	\$57.49	(\$25.46)	\$32.03	\$82.77	\$148.56
2033		\$109.60	\$40.51	\$1.85	\$58.80	\$0.00	\$58.80	\$151.96	\$151.96
2034		\$112.12	\$41.43	\$1.89	\$60.15	\$0.00	\$60.15	\$155.44	\$155.44
2035		\$114.70	\$42.38	\$1.93	\$61.53	\$0.00	\$61.53	\$159.01	\$159.01
2036		\$117.34	\$43.35	\$1.97	\$62.94	\$0.00	\$62.94	\$162.66	\$162.66
2037		\$120.04	\$44.33	\$2.02	\$64.39	\$0.00	\$64.39	\$166.39	\$166.39
2038		\$122.80	\$45.35	\$2.07	\$65.87	\$0.00	\$65.87	\$170.22	\$170.22
2039		\$125.62	\$46.39	\$2.12	\$67.38	\$0.00	\$67.38	\$174.13	\$174.13
2040		\$128.51	\$47.46	\$2.17	\$68.93	\$0.00	\$68.93	\$178.14	\$178.14
2041		\$131.34	\$48.50	\$2.22	\$70.45	\$0.00	\$70.45	\$182.06	\$182.06
2042		\$134.23	\$49.57	\$2.27	\$72.00	\$0.00	\$72.00	\$186.07	\$186.07
2043		\$137.32	\$50.71	\$2.32	\$73.66	\$0.00	\$73.66	\$190.35	\$190.35

Sources, Inputs and Assumptions

Source:	(c)(f)	Plant Costs - 2019 IRP Update - Table 6.1 & 6.2
	(a)	Plant capacity cost
	(b)	= (a) x 0.0689863805027125
	(e)	= ((b) + (c)) / (8.76 x 29.5%)
	(g)	= (e) + (f)
	(i)	Plant Costs - 2019 IRP Update - Table 6.1 & 6.2

2019 IRP Utah Wind Resource - 30% Capacity Factor		
Wind	Cost and Input Assumptions	

2018 \$	\$1,301	Plant capacity cost
2018 \$	\$28.80	Fixed O&M, plus on-going capital cost
		Wheeling (\$ MWh)
2018 \$	\$0.00	Variable O&M
		Tax Credit \$/MWh
2023\$	1.47	Network Upgrade (\$/kw-yr) Utah S, Transmission Integration 2023
	6.899%	Payment Factor
	29.5%	Capacity Factor

Company Official Inflation Forecast Dated September 30, 2019					
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2017	2.0%	2026	2.3%	2035	2.3%
2018	2.4%	2027	2.3%	2036	2.3%
2019	1.8%	2028	2.3%	2037	2.3%
2020	1.2%	2029	2.4%	2038	2.3%
2021	3.2%	2030	2.3%	2039	2.3%
2022	2.2%	2031	2.3%	2040	2.3%
2023	2.1%	2032	2.3%	2041	2.2%
2024	2.2%	2033	2.3%	2042	2.2%
2025	2.3%	2034	2.3%	2043	2.3%

ROCKY MOUNTAIN POWER

STEP STUDY BETWEEN PRIOR FILING AND CURRENT FILING

2021.Q2 – SEPTEMBER 2021

2022 - 2036, Nominal Levelized Payment at 6.920% Discount Rate

	2022 - 2036	2023 - 2037	2024 - 2038
2021.Q1 As Filed	\$33.36	\$35.26	\$37.48
OFPC	-\$2.66	-\$3.07	-\$3.02
Load Forecast	-\$0.60	-\$0.72	-\$0.84
Queue	\$3.60	\$3.53	\$3.06
2021.Q2 As Filed	\$33.70	\$35.00	\$36.68

Appendix C

Utah Quarterly Compliance Filing Step Study between 2021.Q2 and 2021.Q1 Compliance Filing Avoided Cost Impact of Changing Assumptions \$/MWH (1)

Year	OFPC	Load Forecast (2)	Queue	Total Impact
2022	\$ 0.75	\$ 0.37	\$ 3.96	\$ 5.08
2023	\$ (3.96)	\$ 0.01	\$ 7.77	\$ 3.82
2024	\$ (4.96)	\$ (0.40)	\$ 6.58	\$ 1.22
2025	\$ (3.55)	\$ 0.82	\$ 3.12	\$ 0.39
2026	\$ (2.23)	\$ (1.26)	\$ 2.89	\$ (0.60)
2027	\$ (2.31)	\$ (1.66)	\$ 3.03	\$ (0.94)
2028	\$ (1.54)	\$ (0.75)	\$ 1.81	\$ (0.48)
2029	\$ (2.40)	\$ 0.55	\$ 2.11	\$ 0.25
2030	\$ (2.72)	\$ (0.75)	\$ 2.36	\$ (1.10)
2031	\$ (3.06)	\$ (1.17)	\$ 2.88	\$ (1.36)
2032	\$ (3.11)	\$ (1.11)	\$ 2.67	\$ (1.56)
2033	\$ (2.68)	\$ (1.52)	\$ 2.38	\$ (1.82)
2034	\$ (2.19)	\$ (1.76)	\$ 2.12	\$ (1.83)
2035	\$ (3.64)	\$ (1.24)	\$ 3.17	\$ (1.71)
2036	\$ (3.23)	\$ (1.37)	\$ 2.69	\$ (1.91)
2037	\$ (3.68)	\$ (1.21)	\$ 2.95	\$ (1.94)
2038	\$ (4.18)	\$ (1.62)	\$ 3.19	\$ (2.61)

Nominal Levelized Payment at 6.920% Discount Rate (3)

2022 - 2036	\$ (2.66)	\$ (0.60)	\$ 3.60	\$ 0.34
2023 - 2037	\$ (3.07)	\$ (0.72)	\$ 3.53	\$ (0.26)
2024 - 2038	\$ (3.02)	\$ (0.84)	\$ 3.06	\$ (0.80)

- (1) Studies are sequential. The order of the studies would affect the price impact.
- (2) Official Forward Price Curve Dated June 2021
- (3) Discount Rate - 2019 IRP - Calculated Annually

Appendix C

Utah Quarterly Compliance Filing Step Study between 2021.Q2 and 2021.Q1 Compliance Filing Total Avoided Cost Prices \$/MWH (1) (4)

Year	2021.Q1 As Filed	OFPC	Load Forecast	Queue (2)
2022	\$22.84	\$23.58	\$23.95	\$27.92
2023	\$21.80	\$17.84	\$17.85	\$25.61
2024	\$16.69	\$11.73	\$11.33	\$17.91
2025	\$18.62	\$15.07	\$15.89	\$19.01
2026	\$33.08	\$30.86	\$29.60	\$32.49
2027	\$35.18	\$32.87	\$31.21	\$34.24
2028	\$38.26	\$36.73	\$35.98	\$37.79
2029	\$40.68	\$38.28	\$38.83	\$40.93
2030	\$40.44	\$37.72	\$36.97	\$39.34
2031	\$42.52	\$39.46	\$38.28	\$41.16
2032	\$43.86	\$40.74	\$39.63	\$42.30
2033	\$45.58	\$42.90	\$41.39	\$43.76
2034	\$46.68	\$44.49	\$42.73	\$44.86
2035	\$47.91	\$44.27	\$43.02	\$46.20
2036	\$50.02	\$46.79	\$45.43	\$48.12
2037	\$52.29	\$48.60	\$47.40	\$50.35
2038	\$53.83	\$49.66	\$48.03	\$51.23

Nominal Levelized Payment at 6.920% Discount Rate (3)

2022 - 2036	\$33.36	\$30.70	\$30.10	\$33.70
2023 - 2037	\$35.26	\$32.19	\$31.47	\$35.00
2024 - 2038	\$37.48	\$34.46	\$33.62	\$36.68

- (1) Studies are sequential. The order of the studies would affect the price impact.
- (2) Official Forward Price Curve Dated June 2021
- (3) Discount Rate - 2019 IRP - Calculated Annually
- (4) Capacity costs are allocated based on assumed 100% capacity factor.

Appendix C

Utah Quarterly Compliance Filing Step Study between 2021.Q2 and 2021.Q1 Compliance Filing GRID Calculated Energy Avoided Cost Prices \$/MWH (1)

Year	2021.Q1 As Filed	OFPC	Load Forecast	Queue (2)
2022	\$22.84	\$23.58	\$23.95	\$27.92
2023	\$21.80	\$17.84	\$17.85	\$25.61
2024	\$16.69	\$11.73	\$11.33	\$17.91
2025	\$18.62	\$15.07	\$15.89	\$19.01
2026	\$19.95	\$17.67	\$16.42	\$19.31
2027	\$21.72	\$19.38	\$17.73	\$20.75
2028	\$24.52	\$22.97	\$22.22	\$24.03
2029	\$26.56	\$24.15	\$24.70	\$26.80
2030	\$25.99	\$23.27	\$22.52	\$24.88
2031	\$27.74	\$24.67	\$23.50	\$26.37
2032	\$28.78	\$25.66	\$24.54	\$27.21
2033	\$30.12	\$27.43	\$25.91	\$28.29
2034	\$30.85	\$28.66	\$26.90	\$29.03
2035	\$31.69	\$28.08	\$26.83	\$30.00
2036	\$33.48	\$30.27	\$28.91	\$31.60
2037	\$35.32	\$31.66	\$30.45	\$33.40
2038	\$36.48	\$32.32	\$30.69	\$33.89

Nominal Levelized Payment at 6.92% Discount Rate (3)

2022 - 2036	\$24.18	\$21.52	\$20.92	\$24.53
2023 - 2037	\$24.78	\$21.70	\$20.97	\$24.51
2024 - 2038	\$25.57	\$22.55	\$21.71	\$24.76

- (1) Studies are sequential. The order of the studies would affect the price impact.
- (2) Official Forward Price Curve Dated June 2021
- (3) Discount Rate - 2019 IRP - Calculated Annually

Appendix C
Utah Quarterly Compliance Filing
Step Study between 2021.Q2 and 2021.Q1 Compliance Filing
Capacity Avoided Cost Prices

Year	\$/kW-Year				\$/MWH (1)			
	2021.Q1	OFPC	Load Forecast	2021.Q2	2021.Q1	OFPC	Load Forecast	2021.Q2
2022	-	-	-	-	-	-	-	-
2023	-	-	-	-	-	-	-	-
2024	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-
2026	\$ 115.07	\$ 115.47	\$ 115.47	\$ 115.47	\$ 13.14	\$ 13.18	\$ 13.18	\$ 13.18
2027	\$ 117.94	\$ 118.12	\$ 118.12	\$ 118.12	\$ 13.46	\$ 13.48	\$ 13.48	\$ 13.48
2028	\$ 120.77	\$ 120.86	\$ 120.86	\$ 120.86	\$ 13.75	\$ 13.76	\$ 13.76	\$ 13.76
2029	\$ 123.67	\$ 123.76	\$ 123.76	\$ 123.76	\$ 14.12	\$ 14.13	\$ 14.13	\$ 14.13
2030	\$ 126.54	\$ 126.63	\$ 126.63	\$ 126.63	\$ 14.44	\$ 14.46	\$ 14.46	\$ 14.46
2031	\$ 129.44	\$ 129.53	\$ 129.53	\$ 129.53	\$ 14.78	\$ 14.79	\$ 14.79	\$ 14.79
2032	\$ 132.42	\$ 132.52	\$ 132.52	\$ 132.52	\$ 15.07	\$ 15.09	\$ 15.09	\$ 15.09
2033	\$ 135.47	\$ 135.54	\$ 135.54	\$ 135.54	\$ 15.46	\$ 15.47	\$ 15.47	\$ 15.47
2034	\$ 138.72	\$ 138.67	\$ 138.67	\$ 138.67	\$ 15.84	\$ 15.83	\$ 15.83	\$ 15.83
2035	\$ 142.03	\$ 141.83	\$ 141.83	\$ 141.83	\$ 16.21	\$ 16.19	\$ 16.19	\$ 16.19
2036	\$ 145.30	\$ 145.11	\$ 145.11	\$ 145.11	\$ 16.54	\$ 16.52	\$ 16.52	\$ 16.52
2037	\$ 148.61	\$ 148.47	\$ 148.47	\$ 148.47	\$ 16.96	\$ 16.95	\$ 16.95	\$ 16.95
2038	\$ 152.04	\$ 151.88	\$ 151.88	\$ 151.88	\$ 17.36	\$ 17.34	\$ 17.34	\$ 17.34

Nominal Levelized Payment at 6.920% Discount Rate (2)

2022 - 2036	\$80.41	\$80.47	\$80.47	\$80.47	\$9.17	\$9.18	\$9.18	\$9.18
2023 - 2037	\$91.92	\$91.98	\$91.98	\$91.98	\$10.49	\$10.49	\$10.49	\$10.49
2024 - 2038	\$104.37	\$104.42	\$104.42	\$104.42	\$11.91	\$11.91	\$11.91	\$11.91

- (1) Capacity costs are allocated based on assumed 100% capacity factor.
- (2) Discount Rate - 2019 IRP
- (3) No Capacity costs - No deferrable thermal resources

CERTIFICATE OF SERVICE

Docket Nos. 21-035-44/03-035-14

I hereby certify that a true and correct copy of the foregoing **2021.Q2 Avoided Cost Input Changes Quarterly Compliance Filing** was served upon the following by email on September 20, 2021.

Assistant Attorney General

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