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Salt Lake City, Utah 84116

January 10, 2020

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 Administrator

Re: **Docket No. 03-035-14 – Quarterly Compliance Filing – 2019.Q3 Avoided Cost Input Changes**
Docket No. 19-035-18 – 2019.Q3 Avoided Cost Input Changes Quarterly Compliance Filing

PacifiCorp (d/b/a Rocky Mountain Power) 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.

No comments were filed challenging the Company’s previous compliance filing, which was submitted to the Commission on September 30, 2019 (“2019.Q2 filing”).

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 September 30, 2019 (1909 OFPC).

2. **2019 Integrated Resource Plan (“IRP”)**

Updates to reflect 2019 IRP assumptions, including the preferred portfolio, capacity contribution, regulation reserve requirements (integration cost), and energy storage dispatch. In addition, the generation profiles used for the indicative wind and solar QFs have been modified to be consistent with 2019 IRP assumptions.

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

Update of signed contract queue and current potential QFs. The QF queue was revised to include 1,784 MW nameplate in this filing. The potential queue was 2,687 MW nameplate in the 2019.Q2 filing.

4. **Production Tax Credit Update**

House Resolution 1865 was signed by the president and became law on December 20, 2019.¹ As a result of this law, wind resources which begin construction after December 31, 2019 and before January 1, 2021 and which reach commercial operation within four years will qualify for a 60 percent production tax credit. As a result, the 2024 Wyoming wind resource in the 2019 IRP preferred portfolio (with an assumed online date of 12/31/2023) is now expected to qualify for a sixty percent production tax credit, up from the forty percent production tax credit assumed in the 2019 IRP.

Non-Routine Updates

1. **Utah Wind Resource Deferral**

The 2019 IRP preferred portfolio includes 69 MW of Utah wind resources in 2023 and 1920 MW of Wyoming wind resources in 2024. The proxy wind QF resource is assumed to have the same generation profile as the Utah wind resource selected in the 2019 IRP. Under the approved PDDRR avoided cost methodology, only cost-effective renewable resources are eligible for deferral. In the 2019 IRP, the 2023 Utah wind resource was identified as a “customer preference” resource, and was one of a portfolio of renewable resources added to meet anticipated customer demand for renewable resources. Meeting this renewable resource requirement results in incremental costs, identified in Sensitivity S-07, indicating the portfolio of incremental renewables is not cost-effective.²

When the PDDRR method is applied based on the deferral of Wyoming wind, the avoided cost exceeds the resource cost of Utah wind resources, which were also available to be selected as part of the 2019 IRP. This outcome suggests that the IRP models would have shown a benefit from adding more Utah wind resources, rather than Wyoming wind resources. The fact that it did not, and that the Wyoming wind resource capacity selection was unchanged by the addition of Utah wind resources in the preferred portfolio relative to Sensitivity S-07, indicates that the IRP models may not consider the Utah and Wyoming wind resources interchangeable on a capacity-equivalent basis. For this compliance filing, PacifiCorp is proposing a modification to base the proxy Utah wind QF pricing on deferral

¹ Details available online: <https://www.congress.gov/bill/116th-congress/house-bill/1865>.

² 2019 IRP: Chapter 8, pages 269-270.

of Utah wind resources with a comparable profile and geographic location with the cost and performance assumptions in the 2019 IRP, rather than on Wyoming wind resources from the preferred portfolio.

PacifiCorp believes that this modification results in a more accurate representation of the avoided cost associated with Utah wind resources than the current methodology based on deferral of Wyoming wind resources. However, PacifiCorp recognizes that additional examination of the interplay between IRP portfolio selection and the PDDRR methodology is warranted. In particular, as part of the reliability assessment performed on each portfolio evaluated in the 2019 IRP, PacifiCorp identified significant differences between portfolios with seemingly equivalent capacity contributions. To that end, PacifiCorp intends to assess the portfolio impacts and avoided costs of potential Utah QFs using the IRP tools and to file the results and conclusions at a future date.

Additional Details

Additional detail is provided below:

1. **PDDRR Avoided Cost Methodology** – The proxy resources used in the PDDRR avoided cost methodology are consistent with the Company’s 2019 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-alone storage and thermal resources. The incremental thermal QF resource partially displaces summer and winter front office transactions (“FOT”) during 2020-2025, and the Naughton simple-cycle combustion turbine in 2026. The incremental tracking solar QF resource partially displaces summer and winter FOTs during 2020-2023 and the Jim Bridger solar with storage resource in 2024. The incremental wind QF resource partially displaces summer and winter FOTs during 2020-2022 and the Utah wind resource in 2023.
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 a 69.2 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

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. 19-035-18)

ROCKY MOUNTAIN POWER
DESCRIPTION OF AVOIDED COST INPUT CHANGES
2019.Q3 – December 2019

Appendix A

PacifiCorp Avoided Cost (Partial Displacement Differential Revenue Requirement (“PDDRR”)) Model Updates through December 2019 Docket 19-035-18 / Docket 03-035-14

Assumptions that have changed since the 2019.Q2 compliance filing are in **bold and underline**.

GRID Scenario Study Period

- January 1, 2020 through December 31, 2034 - 15-year study.
- Avoided cost prices starting in January 2020.

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

- **Updated to PacifiCorp’s September 30, 2019 OFPC (1909 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 2019.
- 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 March 2019.
- 2019 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 **September 2019**.

Levelized Prices (Nominal) at 6.92 percent Discount Rate

- 15 years 2020 through 2034.
- Levelized prices are for illustrative purposes only.

Load Forecast (Retail)

- 20-year load forecast dated June 20, 2019.

Long-Term Contracts

- Long-term contracts which have prices that are indexed to market are consistent with the **1909 OFPC**.
- Contracts are modeled based on 48 months ended December 2018.
- 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 December 2018.
- 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 **September 2019**

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 **September 2019**.

Size of the Avoided Cost Resource

- The avoided cost thermal resource is 100 megawatt (“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 69.2 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 2018.

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 June 2018.
- **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	CF	Capacity Contribution	Start Date
	n/a					

Total Signed MW		0.00	0.00			
No.	Potential QF Contracts	Partial Displacement	Name plate	CF	Capacity Contribution	Start Date
1	QF - 249 - OR - Solar	4.52	40.0	29.1%	11.3%	2019 12 31
2	QF - 279 - OR - Solar	4.52	40.0	31.0%	11.3%	2019 12 31
3	QF - 280 - OR - Solar	2.26	20.0	27.9%	11.3%	2019 01 01
4	QF - 514 - WY - Gas	0.00	30.0	85.0%	0.0%	2020 01 01
5	QF - 541 - WY - Solar	6.17	80.0	27.2%	7.7%	2022 06 01
6	QF - 542 - WY - Solar	6.17	80.0	27.2%	7.7%	2022 06 01
7	QF - 516 - WY - Wind	1.56	24.8	33.1%	6.3%	2019 12 01
8	QF - 517 - WY - Wind	0.11	1.8	34.5%	6.1%	2019 12 01
9	QF - 519 - WY - Solar	6.03	80.0	28.6%	7.5%	2022 09 01
10	QF - 520 - WY - Solar	6.03	80.0	28.6%	7.5%	2022 09 01
11	QF - 433 - UT - Gas	0.00	31.8	58.2%	0.0%	2020 01 01
12	QF - 434 - UT - Gas	0.00	6.2	85.0%	0.0%	2020 01 01
13	QF - 435 - UT - Gas	0.00	25.0	85.0%	0.0%	2020 01 01
14	QF - 521 - OR - Solar	7.99	80.0	26.7%	10.0%	2022 12 01
15	QF - 522 - OR - Solar	7.99	80.0	26.7%	10.0%	2022 12 01
16	QF - 523 - OR - Solar	8.61	80.0	26.7%	10.8%	2022 12 01
17	QF - 524 - OR - Solar	8.61	80.0	26.7%	10.8%	2022 12 01
18	QF - 525 - WY - Gas	0.00	98.0	75.0%	0.0%	2020 01 01
19	QF - 527 - WY - Wind	1.2	16.8	34.5%	7.3%	2020 11 01
20	QF - 528 - UT - Solar	4.5	78.0	29.9%	5.7%	2022 09 01
21	QF - 538 - OR - Solar	10.40	80.0	33.4%	13.0%	2023 10 01
22	QF - 537 - WY - Wind	1.67	16.5	29.5%	10.1%	2019 09 01
23	QF - 540 - UT - Solar	2.32	35.0	34.5%	6.6%	2022 10 01
24	QF - 254 - OR - Solar	6.21	55.0	29.4%	11.3%	2021 01 01
25	QF - 505 - WY - Solar	51.72	80.0	38.6%	64.7%	2023 01 01
26	QF - 442 - WY - Solar	6.54	80.0	26.7%	8.2%	2023 01 01

27	QF - 506 - WY - Solar	51.72	80.0	38.6%	64.7%	2023 01 01
28	QF - 507 - UT - Solar	48.20	80.0	38.6%	60.3%	2023 01 01
29	QF - 509 - UT - Solar	48	80.0	38.6%	60.3%	2023 01 01
30	QF - 508 - WY - Solar	29.3	50.0	31.7%	58.6%	2023 01 01
31	QF - 542 - UT - Solar	4.9	74.0	32.7%	6.6%	2023 02 01
32	QF - 543 - UT - Solar	1.4	21.0	32.8%	6.6%	2023 02 01
Total Potential MW		338.82	1783.85			
Total Partial Displacement		338.82	1783.85			
33	Utah 2019.Q3	100.00	100.00	100.0%	100.0%	2020 01 01
Partial Displacement after QF		438.82	1883.85			

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 2020-2025 and Naughton simple cycle combustion turbine in 2026.**
- Tracking Solar: **1,063** nameplate MW of solar resources are displaced by the QF queue. After degradation, the incremental solar QF displaces **25 MW of solar with storage resource located at Jim Bridger in 2024. The Company retains 100% of the RECs starting in 2024.**
- Wind: 36 MW of wind resources are displaced by the QF queue. **The incremental wind QF displaces 69 MW of UT wind resource in 2023. The Company retains 100% of the RECs starting in 2023.**

	Base Case Displacement (Nameplate MW)							
Year	Thermal	Battery	SolarwB	WindwB	Wind	FOT Summer	FOT Winter	FOT Flat
2019	-	-	-	-	-	2	2	-
2020	-	-	-	-	-	15	15	-
2021	-	-	-	-	-	22	22	-
2022	-	-	-	-	-	34	34	-
2023	-	-	-	-	-	328	314	-
2024	-	-	1,043	-	36	6	6	-
2025	-	-	1,043	-	36	6	6	-
2026	-	-	1,043	-	36	6	6	-
2027	-	-	1,043	-	36	6	6	-
2028	-	-	1,043	-	36	6	6	-
2029	-	-	1,063	-	36	-	-	-
2030	-	-	1,063	-	36	-	-	-
2031	-	-	1,063	-	36	-	-	-
2032	-	-	1,063	-	36	-	-	-
2033	-	-	1,063	-	36	-	-	-
2034	-	-	1,063	-	36	-	-	-
2035	-	-	1,063	-	36	-	-	-
2036	-	-	1,063	-	36	-	-	-
2037	-	-	1,063	-	36	-	-	-
2038	-	-	1,063	-	36	-	-	-

IRP Partial Displacements (Previous Filing)

Total partial displacement was 1,476 MW in the base case and 1,576 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	CF	Capacity Contribution	Start Date
1	Soda Lake Geothermal PPA	13.3	20.0		66.5%	2019 09 01
2	Sprague River QF(terminated)	-4.5	-7.0		64.8%	
3	Ivory Pine QF (terminated)	-6.5	-10.0		64.8%	
4	Deschutes Valley Water District QF	5.9	5.9		100.0%	2021 01 01
5	Cove Mountain Solar PPA	34.6	58.0		59.7%	2020 12 31
6	Hunter Solar PPA	59.7	100.0		59.7%	2020 12 31
7	Milford Solar PPA	59.1	99.0		59.7%	2020 11 30
8	Milican Solar PPA	29.2	45.0		64.8%	2020 12 31
9	Prineville Solar PPA	35.6	55.0		64.8%	2020 12 31
10	Sigurd Solar PPA	47.8	80.0		59.7%	2020 12 31
11	Three Sisters Irrig. District PPA	0.2	0.2		100.0%	2018 11 05
12	Cove Mountain Solar II PPA	72.8	122.0		59.7%	2020 11 01
13	Non-deferrable PPA_P2*	46.6	78.0		59.7%	2022 05 01
14	Non-deferrable PPA_P3*	59.7	100.0		59.7%	2023 07 01
15	Non-deferrable PPA_P4*	59.7	100.0		59.7%	2025 06 01
16	Non-deferrable PPA_P5*	59.7	100.0		59.7%	2026 08 01
17	Non-deferrable PPA_P6*	29.9	50.0		59.7%	2028 06 01
18	Everpower QF**	-0.03	-0.2		15.8%	2020 12 01
19	IRP17 WYAE WindUinta2020	-25.4	-161.0		15.8%	2020 11 01
20	Monticello Wind QF	-12.5	-79.2		15.8%	2021 12 31
21	Simplot Phosphates QF	0	13.3		0%	2018 02 01
22	Tesoro Non Firm QF	0	25.0		0%	2019 01 01
23	Kennecott Smelter Non Firm QF	0	31.8		0%	2019 01 01
24	Kennecott Refinery Non Firm QF	0	6.2		0%	2019 01 01
25	ExxonMobil QF	0	98.0		0%	2019 01 01
26	Tata Chemicals QF	0	30.0		0%	2019 01 01
27	Cedar Springs Wind III PPA	19.0	120.0		15.8%	2020 12 31
28	Roseburg Weed QF	2.9	10.0		29.0%	2019 01 01
29	Slate Creek Hydro QF	0.6	4.2		14.0%	2019 01 01
30	Yakima Tieton Cowiche QF	1.0	1.5		67.0%	2019 01 01
31	Roseburg Dillard QF	2.44	2.44		100.0%	2019 01 01
32	COID Siphon QF	3.1	5.0		62.0%	2021 01 01
Total Signed MW		593.72	1103.14			
No.	Potential QF Contracts	Partial Displacement	Name plate	CF	Capacity Contribution	Start Date
1	QF - 249 - OR - Solar	25.9	40.0	29.1%	64.8%	2019 12 31

2	QF - 279 - OR - Solar	25.9	40.0	31.0%	64.8%	2019 12 31
3	QF - 280 - OR - Solar	13.0	20.0	27.9%	64.8%	2019 01 01
4	QF - 505 - WY - Solar	60.7	80.0	38.6%	75.8%	2022 02 01
5	QF - 514 - WY - Gas	0	30.0	85.0%	0.0%	2020 01 01
6	QF - 541 - WY - Solar	47.7	80.0	27.2%	59.7%	2022 06 01
7	QF - 542 - WY - Solar	47.7	80.0	27.2%	59.7%	2022 06 01
8	QF - 516 - WY - Wind	3.9	24.8	34.5%	15.8%	2019 08 01
9	QF - 517 - WY - Wind	0.3	1.8	34.5%	15.6%	2019 08 01
10	QF - 442 - WY - Solar	47.7	80.0	26.7%	59.7%	2022 05 01
11	QF - 506 - WY - Solar	60.7	80.0	38.6%	75.8%	2022 05 01
12	QF - 519 - WY - Solar	47.7	80.0	27.2%	59.7%	2022 09 01
13	QF - 520 - WY - Solar	47.7	80.0	27.2%	59.7%	2022 09 01
14	QF - 433 - UT - Gas	0	31.8	58.2%	0.0%	2020 01 01
15	QF - 434 - UT - Gas	0	6.2	85.0%	0.0%	2020 01 01
16	QF - 435 - UT - Gas	0	25.0	85.0%	0.0%	2020 01 01
17	QF - 521 - OR - Solar	51.8	80.0	26.7%	64.8%	2022 12 01
18	QF - 522 - OR - Solar	51.8	80.0	26.7%	64.8%	2022 12 01
19	QF - 523 - OR - Solar	51.8	80.0	26.7%	64.8%	2022 12 01
20	QF - 524 - OR - Solar	51.8	80.0	26.7%	64.8%	2022 12 01
21	QF - 525 - WY - Gas	0	98.0	75.0%	0.0%	2020 01 01
22	QF - 527 - WY - Wind	2.7	16.80	34.5%	15.8%	2020 11 01
23	QF - 528 - UT - Solar	46.5	78.0	29.9%	59.7%	2022 09 01
24	QF - 507 - UT - Solar	60.7	80.0	38.6%	75.8%	2022 07 01
25	QF - 509 - UT - Solar	60.7	80.0	38.6%	75.8%	2022 07 01
26	QF - 538 - OR - Solar	51.8	80.0	33.4%	64.8%	2023 10 01
27	QF - 537 - WY - Wind	2.6	16.5	29.5%	15.8%	2019 09 01
28	QF - 540 - UT - Solar	20.9	35.0	34.5%	59.7%	2022 10 01
Total Potential MW		882.22	1583.85			

Total Partial Displacement	1475.94	2686.99			
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29	Utah 2019.Q2	100.00	100.00	100.0%	100.0%	2019 01 01
Partial Displacement after QF		1575.94	2786.99			

ROCKY MOUNTAIN POWER

UPDATE IMPACT – UPDATED AVOIDED COST STUDY

2019.Q3 – December 2019

Appendix B.1
Avoided Cost Prices \$/MWh
Utah 2019.Q3 Sch 38

Year	Thermal UT 2019.Q3 100.0% CF (2)	Solar Tracking UT 2019.Q3 31.1% CF (2)	Wind UT 2019.Q3 31.0% CF (2)	Thermal UT 2019.Q2 Filing	Solar Tracking UT 2019.Q2 Filing	Wind UT 2019.Q2 Filing	Thermal Difference	Solar Tracking Difference	Wind Difference
2020	\$15.04	\$12.42	\$14.41	\$18.30	\$17.93	\$14.15	(\$3.26)	(\$5.51)	\$0.26
2022	\$13.78	\$11.58	\$12.60	\$18.66	\$15.83	\$15.32	(\$4.88)	(\$4.25)	(\$2.72)
2023	\$13.95	\$11.43	\$25.36	\$19.45	\$16.03	\$16.71	(\$5.50)	(\$4.60)	\$8.65
2024	\$9.63	\$10.08	\$26.38	\$21.53	\$17.24	\$18.42	(\$11.90)	(\$7.16)	\$7.96
2025	\$10.65	\$10.28	\$26.69	\$24.16	\$20.64	\$22.75	(\$13.52)	(\$10.36)	\$3.94
2026	\$27.01	\$12.38	\$27.80	\$28.65	\$22.28	\$26.00	(\$1.64)	(\$9.90)	\$1.80
2027	\$26.59	\$9.28	\$28.14	\$30.06	\$23.01	\$27.27	(\$3.46)	(\$13.73)	\$0.87
2028	\$33.51	\$14.89	\$29.30	\$33.32	\$25.32	\$31.05	\$0.19	(\$10.43)	(\$1.75)
2029	\$37.57	\$14.99	\$29.79	\$37.24	\$29.87	\$35.04	\$0.33	(\$14.88)	(\$5.25)
2030	\$36.41	\$14.36	\$30.22	\$41.89	\$34.20	\$50.11	(\$5.47)	(\$19.84)	(\$19.90)
2031	\$38.06	\$15.93	\$31.44	\$45.71	\$37.22	\$50.02	(\$7.64)	(\$21.29)	(\$18.58)
2032	\$43.45	\$15.22	\$31.82	\$47.92	\$39.40	\$50.09	(\$4.47)	(\$24.19)	(\$18.27)
2033	\$44.82	\$20.76	\$58.97	\$53.47	\$43.49	\$52.81	(\$8.64)	(\$22.73)	\$6.16
2034	\$46.37	\$20.23	\$59.83	\$56.08	\$44.70	\$53.73	(\$9.71)	(\$24.47)	\$6.11
2035	\$48.55	\$19.24	\$61.11	\$59.90	\$45.70	\$54.91	(\$11.35)	(\$26.46)	\$6.21

2020-2034	15-Year Levelized Prices (Nominal) @ 6.920% Discount Rate (1) (3)	\$/MWh	\$24.08	\$13.04	\$26.60	\$29.35	\$23.89	\$27.79	(\$5.27)	(\$10.85)	(\$1.19)
							-18%	-45%	-4%		

Footnotes:

- (1) Discount Rate - 2019 IRP Update
- (2) Total Avoided Costs with Capacity, based on stated CF
- (3) 15-Years: 2020 - 2035, levelized monthly

Table 1
Avoided Cost Prices
Utah 2019.Q3 - 100.0 MW and 100.0% CF

	Total Price @		
Year	Capacity Price \$/kW-yr	Energy Only Price \$/MWh ⁽²⁾	100.0% Capacity Factor \$/MWh
2020	\$0.00	\$15.04	\$15.04
2021	\$0.00	\$15.18	\$15.18
2022	\$0.00	\$13.78	\$13.78
2023	\$0.00	\$13.95	\$13.95
2024	\$0.00	\$9.63	\$9.63
2025	\$0.00	\$10.65	\$10.65
2026	\$112.48	\$14.17	\$27.01
2027	\$115.00	\$13.47	\$26.59
2028	\$117.55	\$20.13	\$33.51
2029	\$120.23	\$23.85	\$37.57
2030	\$122.91	\$22.38	\$36.41
2031	\$125.58	\$23.73	\$38.06
2032	\$128.28	\$28.84	\$43.45
2033	\$131.03	\$29.87	\$44.82
2034	\$133.79	\$31.10	\$46.37
2035	\$136.58	\$32.95	\$48.55
2036	\$139.44	\$35.13	\$51.00
2037	\$142.33	\$37.65	\$53.89
2038	\$145.32	\$41.17	\$57.75
2039	\$148.33	\$42.02	\$58.95

15 Year Starting 2020

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

\$/kW	\$58.18		
\$/MWh		\$17.44	\$24.08

Footnotes:

(1) Discount Rate - 2019 IRP Update

(2) 'Energy Only' is the GRID calculated costs and includes some capacity costs.

Table 2
Avoided Energy Costs - Scheduled Hours (\$/MWh)
Utah 2019.Q3 - 100.0 MW and 100.0% CF

Year	Annual	Winter Season					Summer Season				Winter Season		
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Energy Only													
2020	15.04	13.74	13.48	14.75	13.05	13.18	15.25	22.92	22.87	12.25	12.12	14.13	12.44
2021	15.18	14.12	15.68	14.87	13.26	13.09	13.06	19.62	19.65	16.36	13.78	12.86	15.67
2022	13.78	13.51	14.16	14.54	12.20	12.42	13.19	17.03	17.26	12.81	11.69	14.18	12.32
2023	13.95	13.17	11.85	11.49	11.08	13.74	11.78	19.75	19.03	14.20	12.90	14.68	13.40
2024	9.63	12.06	11.38	6.52	5.98	9.49	7.62	15.97	10.71	10.25	5.81	11.33	8.44
2025	10.65	15.36	8.44	8.43	5.34	10.55	7.81	16.80	17.76	9.92	6.96	9.93	9.93
2026	14.17	12.73	13.22	9.66	6.31	10.66	18.63	21.18	22.41	15.63	13.58	13.30	12.51
2027	13.47	10.75	9.79	14.45	5.26	11.13	16.20	23.34	20.00	16.79	16.74	10.18	6.42
2028	20.13	20.72	18.43	17.19	19.85	19.66	19.98	25.99	28.60	22.52	16.29	13.13	18.87
2029	23.85	23.52	18.76	20.07	15.35	18.92	25.38	34.93	31.97	28.45	23.17	21.25	23.77
2030	22.38	18.84	16.71	14.71	15.00	14.94	21.36	32.78	39.03	28.43	21.08	21.41	23.63
2031	23.73	18.53	22.56	16.74	18.23	17.40	13.62	37.48	38.23	28.71	25.65	22.99	24.11
2032	28.84	27.46	31.13	21.63	20.57	23.17	24.99	41.37	41.66	33.62	25.79	26.35	28.23
2033	29.87	26.84	25.72	20.04	22.78	19.40	29.26	41.98	42.56	35.96	33.74	27.85	31.75
2034	31.10	27.62	27.77	23.90	28.57	20.29	33.41	43.66	44.41	35.90	25.07	28.80	33.56
2035	32.95	30.57	30.73	21.70	25.56	23.35	35.44	45.75	46.44	37.91	30.81	33.20	33.78
2036	35.13	36.10	32.24	26.81	26.84	25.10	35.14	49.23	47.77	38.49	36.70	28.13	38.40
2037	37.65	35.20	35.03	28.67	31.83	27.71	39.48	50.88	49.97	36.90	35.17	38.47	42.05

Table 4
Burnertip Natural Gas Price Forecast
Utah 2019.Q3 - 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	\$2.35	\$2.36	\$4.15	\$2.10
2020	\$2.04	\$2.05	\$2.10	\$1.89
2021	\$2.05	\$2.06	\$2.06	\$1.94
2022	\$2.16	\$2.17	\$2.16	\$2.03
2023	\$2.42	\$2.43	\$2.44	\$2.29
2024	\$2.71	\$2.72	\$2.75	\$2.58
2025	\$2.98	\$2.99	\$3.06	\$2.85
2026	\$3.16	\$3.17	\$3.10	\$3.02
2027	\$3.37	\$3.38	\$3.35	\$3.24
2028	\$3.70	\$3.71	\$3.70	\$3.57
2029	\$4.04	\$4.05	\$4.04	\$3.90
2030	\$4.31	\$4.32	\$4.32	\$4.17
2031	\$4.63	\$4.64	\$4.62	\$4.48
2032	\$4.91	\$4.92	\$4.87	\$4.76
2033	\$4.98	\$4.99	\$4.94	\$4.83
2034	\$5.26	\$5.27	\$5.26	\$5.10
2035	\$5.48	\$5.49	\$5.43	\$5.32
2036	\$5.55	\$5.56	\$5.45	\$5.39
2037	\$5.95	\$5.96	\$5.85	\$5.79
2038	\$6.24	\$6.25	\$6.13	\$6.08
2039	\$6.37	\$6.38	\$6.25	\$6.20
2040	\$6.68	\$6.69	\$6.53	\$6.51

Official Forward Price Curve Forecast dated Sep 30, 2019

Table 5

**Utah 2019.Q3 - 100.0 MW and 100.0% CF
January 2020 through December 2039**

Nominal Avoided Costs Calculated Monthly

15 Year Starting 2020 \$ 144,336,849 \$ 54,967,729 \$ 199,304,578 \$ 8,275,707 \$24.08

Nominal NPV at 6.92% Discount Rate

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	100.0% CF	Dollars	MWH	100.0% CF
Jan-20	1,022,450	-	1,022,450	74,400	13.74
Feb-20	938,019	-	938,019	69,600	13.48
Mar-20	1,097,400	-	1,097,400	74,400	14.75
Apr-20	939,361	-	939,361	72,000	13.05
May-20	980,775	-	980,775	74,400	13.18
Jun-20	1,097,914	-	1,097,914	72,000	15.25
Jul-20	1,705,046	-	1,705,046	74,400	22.92
Aug-20	1,701,672	-	1,701,672	74,400	22.87
Sep-20	882,307	-	882,307	72,000	12.25
Oct-20	901,368	-	901,368	74,400	12.12
Nov-20	1,017,398	-	1,017,398	72,000	14.13
Dec-20	925,817	-	925,817	74,400	12.44
Jan-21	1,050,561	-	1,050,561	74,400	14.12
Feb-21	1,053,767	-	1,053,767	67,200	15.68
Mar-21	1,106,578	-	1,106,578	74,400	14.87
Apr-21	955,005	-	955,005	72,000	13.26
May-21	973,532	-	973,532	74,400	13.09
Jun-21	940,025	-	940,025	72,000	13.06
Jul-21	1,460,026	-	1,460,026	74,400	19.62
Aug-21	1,461,700	-	1,461,700	74,400	19.65
Sep-21	1,178,015	-	1,178,015	72,000	16.36
Oct-21	1,024,950	-	1,024,950	74,400	13.78
Nov-21	926,125	-	926,125	72,000	12.86
Dec-21	1,166,067	-	1,166,067	74,400	15.67
Jan-22	1,005,272	-	1,005,272	74,400	13.51
Feb-22	951,464	-	951,464	67,200	14.16
Mar-22	1,081,649	-	1,081,649	74,400	14.54
Apr-22	878,090	-	878,090	72,000	12.20
May-22	923,843	-	923,843	74,400	12.42
Jun-22	949,751	-	949,751	72,000	13.19
Jul-22	1,267,190	-	1,267,190	74,400	17.03
Aug-22	1,284,284	-	1,284,284	74,400	17.26
Sep-22	922,551	-	922,551	72,000	12.81
Oct-22	869,992	-	869,992	74,400	11.69
Nov-22	1,021,267	-	1,021,267	72,000	14.18
Dec-22	916,804	-	916,804	74,400	12.32
Jan-23	979,886	-	979,886	74,400	13.17
Feb-23	796,254	-	796,254	67,200	11.85
Mar-23	854,506	-	854,506	74,400	11.49
Apr-23	797,747	-	797,747	72,000	11.08
May-23	1,022,008	-	1,022,008	74,400	13.74
Jun-23	847,853	-	847,853	72,000	11.78
Jul-23	1,469,328	-	1,469,328	74,400	19.75
Aug-23	1,415,487	-	1,415,487	74,400	19.03
Sep-23	1,022,699	-	1,022,699	72,000	14.20
Oct-23	959,699	-	959,699	74,400	12.90
Nov-23	1,056,722	-	1,056,722	72,000	14.68
Dec-23	996,694	-	996,694	74,400	13.40
Jan-24	897,107	-	897,107	74,400	12.06
Feb-24	792,232	-	792,232	69,600	11.38

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	100.0% CF	Dollars	MWH	100.0% CF
Mar-24	484,746	-	484,746	74,400	6.52
Apr-24	430,410	-	430,410	72,000	5.98
May-24	705,941	-	705,941	74,400	9.49
Jun-24	548,502	-	548,502	72,000	7.62
Jul-24	1,188,374	-	1,188,374	74,400	15.97
Aug-24	796,987	-	796,987	74,400	10.71
Sep-24	737,663	-	737,663	72,000	10.25
Oct-24	431,985	-	431,985	74,400	5.81
Nov-24	815,455	-	815,455	72,000	11.33
Dec-24	627,674	-	627,674	74,400	8.44
Jan-25	1,142,746	-	1,142,746	74,400	15.36
Feb-25	567,471	-	567,471	67,200	8.44
Mar-25	626,941	-	626,941	74,400	8.43
Apr-25	384,513	-	384,513	72,000	5.34
May-25	784,693	-	784,693	74,400	10.55
Jun-25	562,123	-	562,123	72,000	7.81
Jul-25	1,249,884	-	1,249,884	74,400	16.80
Aug-25	1,321,056	-	1,321,056	74,400	17.76
Sep-25	714,338	-	714,338	72,000	9.92
Oct-25	518,130	-	518,130	74,400	6.96
Nov-25	714,973	-	714,973	72,000	9.93
Dec-25	738,882	-	738,882	74,400	9.93
Jan-26	947,030	937,361	1,884,390	74,400	25.33
Feb-26	888,398	937,361	1,825,759	67,200	27.17
Mar-26	719,020	937,361	1,656,381	74,400	22.26
Apr-26	454,001	937,361	1,391,362	72,000	19.32
May-26	793,458	937,361	1,730,819	74,400	23.26
Jun-26	1,341,419	937,361	2,278,780	72,000	31.65
Jul-26	1,575,702	937,361	2,513,063	74,400	33.78
Aug-26	1,666,998	937,361	2,604,359	74,400	35.00
Sep-26	1,125,051	937,361	2,062,412	72,000	28.64
Oct-26	1,010,563	937,361	1,947,923	74,400	26.18
Nov-26	957,482	937,361	1,894,843	72,000	26.32
Dec-26	930,520	937,361	1,867,881	74,400	25.11
Jan-27	799,913	958,333	1,758,246	74,400	23.63
Feb-27	658,126	958,333	1,616,459	67,200	24.05
Mar-27	1,074,795	958,333	2,033,129	74,400	27.33
Apr-27	379,056	958,333	1,337,389	72,000	18.57
May-27	828,025	958,333	1,786,359	74,400	24.01
Jun-27	1,166,205	958,333	2,124,538	72,000	29.51
Jul-27	1,736,566	958,333	2,694,899	74,400	36.22
Aug-27	1,487,892	958,333	2,446,225	74,400	32.88
Sep-27	1,209,159	958,333	2,167,492	72,000	30.10
Oct-27	1,245,749	958,333	2,204,082	74,400	29.62
Nov-27	733,018	958,333	1,691,352	72,000	23.49
Dec-27	477,828	958,333	1,436,162	74,400	19.30
Jan-28	1,541,479	979,583	2,521,062	74,400	33.89
Feb-28	1,283,008	979,583	2,262,592	69,600	32.51
Mar-28	1,278,884	979,583	2,258,467	74,400	30.36
Apr-28	1,429,488	979,583	2,409,072	72,000	33.46
May-28	1,462,498	979,583	2,442,081	74,400	32.82
Jun-28	1,438,868	979,583	2,418,451	72,000	33.59
Jul-28	1,933,931	979,583	2,913,514	74,400	39.16
Aug-28	2,128,108	979,583	3,107,691	74,400	41.77
Sep-28	1,621,414	979,583	2,600,997	72,000	36.12
Oct-28	1,211,813	979,583	2,191,396	74,400	29.45
Nov-28	945,464	979,583	1,925,047	72,000	26.74
Dec-28	1,404,127	979,583	2,383,711	74,400	32.04
Jan-29	1,749,689	1,001,917	2,751,606	74,400	36.98
Feb-29	1,260,772	1,001,917	2,262,688	67,200	33.67

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	100.0% CF	Dollars	MWH	100.0% CF
Mar-29	1,493,442	1,001,917	2,495,359	74,400	33.54
Apr-29	1,105,281	1,001,917	2,107,198	72,000	29.27
May-29	1,407,632	1,001,917	2,409,549	74,400	32.39
Jun-29	1,827,520	1,001,917	2,829,437	72,000	39.30
Jul-29	2,598,482	1,001,917	3,600,398	74,400	48.39
Aug-29	2,378,371	1,001,917	3,380,287	74,400	45.43
Sep-29	2,048,224	1,001,917	3,050,141	72,000	42.36
Oct-29	1,723,985	1,001,917	2,725,902	74,400	36.64
Nov-29	1,529,923	1,001,917	2,531,839	72,000	35.16
Dec-29	1,768,742	1,001,917	2,770,658	74,400	37.24
Jan-30	1,401,921	1,024,250	2,426,171	74,400	32.61
Feb-30	1,122,834	1,024,250	2,147,084	67,200	31.95
Mar-30	1,094,582	1,024,250	2,118,832	74,400	28.48
Apr-30	1,080,343	1,024,250	2,104,593	72,000	29.23
May-30	1,111,545	1,024,250	2,135,795	74,400	28.71
Jun-30	1,537,832	1,024,250	2,562,082	72,000	35.58
Jul-30	2,438,993	1,024,250	3,463,243	74,400	46.55
Aug-30	2,903,906	1,024,250	3,928,156	74,400	52.80
Sep-30	2,046,990	1,024,250	3,071,240	72,000	42.66
Oct-30	1,568,110	1,024,250	2,592,360	74,400	34.84
Nov-30	1,541,660	1,024,250	2,565,910	72,000	35.64
Dec-30	1,757,750	1,024,250	2,782,000	74,400	37.39
Jan-31	1,378,607	1,046,500	2,425,107	74,400	32.60
Feb-31	1,516,231	1,046,500	2,562,731	67,200	38.14
Mar-31	1,245,501	1,046,500	2,292,001	74,400	30.81
Apr-31	1,312,597	1,046,500	2,359,097	72,000	32.77
May-31	1,294,857	1,046,500	2,341,357	74,400	31.47
Jun-31	980,936	1,046,500	2,027,436	72,000	28.16
Jul-31	2,788,228	1,046,500	3,834,728	74,400	51.54
Aug-31	2,844,407	1,046,500	3,890,907	74,400	52.30
Sep-31	2,066,907	1,046,500	3,113,407	72,000	43.24
Oct-31	1,908,436	1,046,500	2,954,936	74,400	39.72
Nov-31	1,655,494	1,046,500	2,701,994	72,000	37.53
Dec-31	1,793,957	1,046,500	2,840,457	74,400	38.18
Jan-32	2,042,719	1,069,000	3,111,719	74,400	41.82
Feb-32	2,166,442	1,069,000	3,235,442	69,600	46.49
Mar-32	1,609,313	1,069,000	2,678,313	74,400	36.00
Apr-32	1,480,702	1,069,000	2,549,702	72,000	35.41
May-32	1,723,529	1,069,000	2,792,529	74,400	37.53
Jun-32	1,799,486	1,069,000	2,868,486	72,000	39.84
Jul-32	3,078,008	1,069,000	4,147,008	74,400	55.74
Aug-32	3,099,635	1,069,000	4,168,635	74,400	56.03
Sep-32	2,420,378	1,069,000	3,489,378	72,000	48.46
Oct-32	1,919,015	1,069,000	2,988,015	74,400	40.16
Nov-32	1,897,487	1,069,000	2,966,487	72,000	41.20
Dec-32	2,100,075	1,069,000	3,169,075	74,400	42.60
Jan-33	1,996,815	1,091,917	3,088,732	74,400	41.52
Feb-33	1,728,459	1,091,917	2,820,376	67,200	41.97
Mar-33	1,490,952	1,091,917	2,582,869	74,400	34.72
Apr-33	1,640,013	1,091,917	2,731,930	72,000	37.94
May-33	1,443,283	1,091,917	2,535,200	74,400	34.08
Jun-33	2,106,747	1,091,917	3,198,663	72,000	44.43
Jul-33	3,123,259	1,091,917	4,215,176	74,400	56.66
Aug-33	3,166,637	1,091,917	4,258,553	74,400	57.24
Sep-33	2,589,197	1,091,917	3,681,114	72,000	51.13
Oct-33	2,510,336	1,091,917	3,602,252	74,400	48.42
Nov-33	2,005,114	1,091,917	3,097,031	72,000	43.01
Dec-33	2,362,181	1,091,917	3,454,098	74,400	46.43
Jan-34	2,054,710	1,114,917	3,169,627	74,400	42.60
Feb-34	1,866,387	1,114,917	2,981,304	67,200	44.36

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	100.0% CF	Dollars	MWH	100.0% CF
Mar-34	1,778,353	1,114,917	2,893,270	74,400	38.89
Apr-34	2,057,304	1,114,917	3,172,221	72,000	44.06
May-34	1,509,507	1,114,917	2,624,424	74,400	35.27
Jun-34	2,405,538	1,114,917	3,520,455	72,000	48.90
Jul-34	3,248,601	1,114,917	4,363,517	74,400	58.65
Aug-34	3,304,295	1,114,917	4,419,211	74,400	59.40
Sep-34	2,584,496	1,114,917	3,699,413	72,000	51.38
Oct-34	1,865,221	1,114,917	2,980,138	74,400	40.06
Nov-34	2,073,699	1,114,917	3,188,616	72,000	44.29
Dec-34	2,496,740	1,114,917	3,611,657	74,400	48.54
Jan-35	2,274,606	1,138,167	3,412,773	74,400	45.87
Feb-35	2,064,862	1,138,167	3,203,028	67,200	47.66
Mar-35	1,614,259	1,138,167	2,752,426	74,400	36.99
Apr-35	1,840,014	1,138,167	2,978,180	72,000	41.36
May-35	1,737,466	1,138,167	2,875,632	74,400	38.65
Jun-35	2,551,758	1,138,167	3,689,925	72,000	51.25
Jul-35	3,403,839	1,138,167	4,542,006	74,400	61.05
Aug-35	3,455,272	1,138,167	4,593,438	74,400	61.74
Sep-35	2,729,247	1,138,167	3,867,413	72,000	53.71
Oct-35	2,292,600	1,138,167	3,430,767	74,400	46.11
Nov-35	2,390,529	1,138,167	3,528,695	72,000	49.01
Dec-35	2,513,454	1,138,167	3,651,620	74,400	49.08
Jan-36	2,685,908	1,162,000	3,847,908	74,400	51.72
Feb-36	2,244,238	1,162,000	3,406,238	69,600	48.94
Mar-36	1,994,878	1,162,000	3,156,878	74,400	42.43
Apr-36	1,932,707	1,162,000	3,094,707	72,000	42.98
May-36	1,867,337	1,162,000	3,029,337	74,400	40.72
Jun-36	2,529,782	1,162,000	3,691,782	72,000	51.27
Jul-36	3,662,883	1,162,000	4,824,883	74,400	64.85
Aug-36	3,554,460	1,162,000	4,716,460	74,400	63.39
Sep-36	2,771,463	1,162,000	3,933,463	72,000	54.63
Oct-36	2,730,653	1,162,000	3,892,653	74,400	52.32
Nov-36	2,025,019	1,162,000	3,187,019	72,000	44.26
Dec-36	2,856,778	1,162,000	4,018,778	74,400	54.02
Jan-37	2,619,173	1,186,083	3,805,256	74,400	51.15
Feb-37	2,354,099	1,186,083	3,540,183	67,200	52.68
Mar-37	2,132,785	1,186,083	3,318,868	74,400	44.61
Apr-37	2,291,657	1,186,083	3,477,741	72,000	48.30
May-37	2,061,921	1,186,083	3,248,005	74,400	43.66
Jun-37	2,842,852	1,186,083	4,028,936	72,000	55.96
Jul-37	3,785,692	1,186,083	4,971,775	74,400	66.82
Aug-37	3,717,418	1,186,083	4,903,501	74,400	65.91
Sep-37	2,656,878	1,186,083	3,842,961	72,000	53.37
Oct-37	2,616,453	1,186,083	3,802,537	74,400	51.11
Nov-37	2,769,906	1,186,083	3,955,990	72,000	54.94
Dec-37	3,128,876	1,186,083	4,314,960	74,400	58.00
Jan-38	3,124,621	1,211,000	4,335,621	74,400	58.27
Feb-38	2,936,186	1,211,000	4,147,186	67,200	61.71
Mar-38	2,705,589	1,211,000	3,916,589	74,400	52.64
Apr-38	2,266,564	1,211,000	3,477,564	72,000	48.30
May-38	1,961,980	1,211,000	3,172,980	74,400	42.65
Jun-38	2,189,609	1,211,000	3,400,609	72,000	47.23
Jul-38	3,952,821	1,211,000	5,163,821	74,400	69.41
Aug-38	4,090,880	1,211,000	5,301,880	74,400	71.26
Sep-38	2,998,152	1,211,000	4,209,152	72,000	58.46
Oct-38	2,829,103	1,211,000	4,040,103	74,400	54.30
Nov-38	3,352,508	1,211,000	4,563,508	72,000	63.38
Dec-38	3,653,001	1,211,000	4,864,001	74,400	65.38

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

Year	Estimated Capital Cost	Capital Cost at Real Levelized Rate	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										
2018				\$7.76						
2019				\$7.91						
2020				\$8.12						
2021				\$8.33						
2022				\$8.54						
2023				\$8.75						
2024				\$8.95						
2025				\$9.15						
2026	\$719	\$50.01	\$38.05	\$9.35	\$65.08	\$115.09	\$3.17	\$31.02	\$70.83	\$112.48
2027		\$51.12	\$38.90	\$9.56	\$66.54	\$117.66	\$3.38	\$33.08	\$73.78	\$115.00
2028		\$52.27	\$39.77	\$9.77	\$68.01	\$120.28	\$3.71	\$36.31	\$77.92	\$117.55
2029		\$53.46	\$40.68	\$9.99	\$69.56	\$123.02	\$4.05	\$39.63	\$82.19	\$120.23
2030		\$54.66	\$41.59	\$10.21	\$71.11	\$125.77	\$4.32	\$42.28	\$85.79	\$122.91
2031		\$55.86	\$42.50	\$10.43	\$72.65	\$128.51	\$4.64	\$45.41	\$89.86	\$125.58
2032		\$57.06	\$43.42	\$10.65	\$74.21	\$131.27	\$4.92	\$48.15	\$93.56	\$128.28
2033		\$58.28	\$44.35	\$10.88	\$75.80	\$134.08	\$4.99	\$48.83	\$95.21	\$131.03
2034		\$59.50	\$45.28	\$11.11	\$77.40	\$136.90	\$5.27	\$51.57	\$98.93	\$133.79
2035		\$60.75	\$46.23	\$11.34	\$79.01	\$139.76	\$5.49	\$53.73	\$102.08	\$136.58
2036		\$62.02	\$47.19	\$11.58	\$80.67	\$142.69	\$5.56	\$54.41	\$103.77	\$139.44
2037		\$63.31	\$48.17	\$11.82	\$82.34	\$145.65	\$5.96	\$58.32	\$108.70	\$142.33
2038		\$64.63	\$49.18	\$12.07	\$84.07	\$148.70	\$6.25	\$61.16	\$112.60	\$145.32
2039		\$65.97	\$50.20	\$12.32	\$85.81	\$151.78	\$6.38	\$62.43	\$114.93	\$148.33
2040		\$67.34	\$51.24	\$12.58	\$87.61	\$154.95	\$6.69	\$65.47	\$119.07	\$151.43
2041		\$68.75	\$52.31	\$12.84	\$89.43	\$158.18	\$6.83	\$66.84	\$121.56	\$154.58
2042		\$70.20	\$53.41	\$13.11	\$91.31	\$161.51	\$6.97	\$68.21	\$124.08	\$157.83

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
	185	MW Plant Capacity
2018 \$	\$745	Plant Capacity Cost
2018 \$	\$17.01	Fixed O&M & Capitalized O&M
2018 \$	\$14.90	Fixed Pipeline
2018 \$	\$31.91	Fixed O&M Including Fixed Pipeline & Capitalized O&M (\$/kW-Yr)
2018 \$	\$7.76	Variable O&M Costs & Capitalized Variable O&M (\$/MWh)
	9,786	Heat Rate in btu/kWh
	6.959%	Payment Factor
	33%	Capacity Factor
	33.0%	Energy Weighted Capacity Factor

Company Official Inflation Forecast Dated September 30, 2019

2017	1.9%	2026	2.2%	2035	2.1%
2018	2.4%	2027	2.2%	2036	2.1%
2019	2.0%	2028	2.2%	2037	2.1%
2020	2.6%	2029	2.3%	2038	2.1%
2021	2.5%	2030	2.2%	2039	2.1%
2022	2.5%	2031	2.2%	2040	2.1%
2023	2.5%	2032	2.2%	2041	2.1%
2024	2.3%	2033	2.1%	2042	2.1%
2025	2.2%	2034	2.1%	2043	2.1%

Appendix B.2
Avoided Cost Prices \$/MWh
Utah 2019.Q3 Sch 38

Year	Thermal UT 2019.Q3 100.0% CF (2)	Solar Tracking UT 2019.Q3 31.1% CF (2)	Wind UT 2019.Q3 31.0% CF (2)	Thermal UT 2019.Q2 Filing	Solar Tracking UT 2019.Q2 Filing	Wind UT 2019.Q2 Filing	Thermal Difference	Solar Tracking Difference	Wind Difference
2020	\$15.04	\$12.42	\$14.41	\$18.30	\$17.93	\$14.15	(\$3.26)	(\$5.51)	\$0.26
2021	\$15.18	\$12.59	\$14.34	\$17.22	\$14.91	\$14.16	(\$2.05)	(\$2.32)	\$0.19
2022	\$13.78	\$11.58	\$12.60	\$18.66	\$15.83	\$15.32	(\$4.88)	(\$4.25)	(\$2.72)
2023	\$13.95	\$11.43	\$25.36	\$19.45	\$16.03	\$16.71	(\$5.50)	(\$4.60)	\$8.65
2024	\$9.63	\$10.08	\$26.38	\$21.53	\$17.24	\$18.42	(\$11.90)	(\$7.16)	\$7.96
2025	\$10.65	\$10.28	\$26.69	\$24.16	\$20.64	\$22.75	(\$13.52)	(\$10.36)	\$3.94
2026	\$27.01	\$12.38	\$27.80	\$28.65	\$22.28	\$26.00	(\$1.64)	(\$9.90)	\$1.80
2027	\$26.59	\$9.28	\$28.14	\$30.06	\$23.01	\$27.27	(\$3.46)	(\$13.73)	\$0.87
2028	\$33.51	\$14.89	\$29.30	\$33.32	\$25.32	\$31.05	\$0.19	(\$10.43)	(\$1.75)
2029	\$37.57	\$14.99	\$29.79	\$37.24	\$29.87	\$35.04	\$0.33	(\$14.88)	(\$5.25)
2030	\$36.41	\$14.36	\$30.22	\$41.89	\$34.20	\$50.11	(\$5.47)	(\$19.84)	(\$19.90)
2031	\$38.06	\$15.93	\$31.44	\$45.71	\$37.22	\$50.02	(\$7.64)	(\$21.29)	(\$18.58)
2032	\$43.45	\$15.22	\$31.82	\$47.92	\$39.40	\$50.09	(\$4.47)	(\$24.19)	(\$18.27)
2033	\$44.82	\$20.76	\$58.97	\$53.47	\$43.49	\$52.81	(\$8.64)	(\$22.73)	\$6.16
2034	\$46.37	\$20.23	\$59.83	\$56.08	\$44.70	\$53.73	(\$9.71)	(\$24.47)	\$6.11

15 year Levelized Prices (Nominal) @ 6.92% Discount Rate (1) (3)										
2020-2034	\$/MWh	\$24.08	\$13.04	\$26.60	\$29.35	\$23.89	\$27.79	(\$5.27)	(\$10.85)	(\$1.19)
							-18%	-45%	-4%	

Footnotes:

- (1) Discount Rate - 2019 IRP Update
- (2) Total Avoided Costs with Capacity, based on stated CF
- (3) 15-Years: 2020 - 2034, levelized monthly

Table 1
Avoided Cost Prices
Utah 2019.Q3_Solar - 80.0 MW and 32.2% CF

Year	Capacity Price \$/kW-yr	Energy Only Price \$/MWh ⁽²⁾	32.2% Capacity Factor \$/MWh
2020	\$0.00	\$12.42	\$12.42
2021	\$0.00	\$12.59	\$12.59
2022	\$0.00	\$11.58	\$11.58
2023	\$0.00	\$11.43	\$11.43
2024	\$28.04	(\$0.04)	\$10.08
2025	\$28.67	(\$0.15)	\$10.28
2026	\$29.30	\$1.67	\$12.38
2027	\$29.95	(\$1.72)	\$9.28
2028	\$30.63	\$3.62	\$14.89
2029	\$31.32	\$3.37	\$14.99
2030	\$32.02	\$2.42	\$14.36
2031	\$32.73	\$3.67	\$15.93
2032	\$33.43	\$2.66	\$15.22
2033	\$34.15	\$7.83	\$20.76
2034	\$34.86	\$6.96	\$20.23
2035	\$35.60	\$5.63	\$19.24
2036	\$36.34	\$11.88	\$25.81
2037	\$37.10	\$7.50	\$21.83
2038	\$37.87	\$15.50	\$30.20
2039	\$38.66	\$15.83	\$30.83

15 Year Starting 2020

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

\$/kW	\$20.00		
\$/MWh		\$5.95	\$13.04

Footnotes:

(1) Discount Rate - 2019 IRP Update

(2) 'Energy Only' is the GRID calculated costs and includes some capacity costs.

Table 2
Avoided Energy Costs - Scheduled Hours (\$/MWh)
Utah 2019.Q3_Solar - 80.0 MW and 32.2% CF

Year	Annual	Winter Season					Summer Season				Winter Season		
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Energy Only													
2020	12.42	15.70	3.42	12.84	11.89	11.83	13.36	15.71	14.86	8.85	11.99	12.72	13.64
2021	12.59	13.77	12.69	11.71	9.86	11.07	12.06	14.24	15.26	12.88	11.44	12.60	14.68
2022	11.58	14.49	8.98	13.85	9.98	11.22	12.48	12.35	14.00	7.46	7.89	14.30	14.04
2023	11.43	14.11	11.77	8.42	5.92	11.22	11.60	13.70	14.33	12.51	7.53	13.81	13.30
2024	(0.04)	7.75	(4.18)	(3.68)	(5.71)	(0.69)	3.73	7.74	1.04	(6.92)	(3.30)	1.31	2.39
2025	(0.15)	5.34	(9.50)	(2.51)	(8.17)	2.42	2.84	4.23	5.60	(6.45)	(2.81)	0.54	3.61
2026	1.67	2.61	(4.47)	(1.21)	(7.66)	2.87	(1.17)	6.38	9.23	(4.52)	(3.30)	10.19	18.89
2027	(1.72)	(0.21)	(2.95)	(0.42)	(10.39)	3.26	(6.79)	4.25	(1.41)	(3.24)	(2.29)	(4.70)	4.79
2028	3.62	7.48	2.37	7.07	(2.02)	3.37	(0.43)	4.99	9.39	1.56	(3.36)	5.96	14.98
2029	3.37	8.33	1.90	0.62	(12.89)	5.42	(6.57)	15.74	7.21	4.17	1.43	9.08	10.01
2030	2.42	6.04	4.62	(4.71)	1.04	3.01	(11.50)	3.74	18.84	(0.25)	(6.79)	15.25	8.85
2031	3.67	15.11	6.32	13.01	1.52	(0.83)	(9.36)	10.47	9.50	(6.77)	7.27	5.44	2.88
2032	2.66	19.17	3.25	8.50	(4.47)	2.18	(17.85)	12.27	8.27	1.69	(5.21)	8.23	11.10
2033	7.83	11.29	7.54	7.17	4.48	3.34	1.20	13.81	12.49	3.71	10.03	6.64	22.33
2034	6.96	9.65	1.55	8.44	5.04	4.28	1.10	14.26	12.15	(0.69)	9.02	9.16	13.69
2035	5.63	12.66	10.56	8.30	4.04	5.94	(8.08)	14.79	12.42	(2.14)	(4.31)	10.44	13.79
2036	11.88	15.06	10.47	10.03	5.45	7.54	9.69	21.86	14.25	10.61	5.99	17.80	18.54
2037	7.50	16.02	15.57	10.77	4.97	1.64	(2.17)	18.01	5.68	(3.29)	5.66	15.20	22.44

Table 4
Burnertip Natural Gas Price Forecast
Utah 2019.Q3_Solar - 80.0 MW and 32.2% 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	\$2.35	\$2.36	\$4.15	\$2.10
2020	\$2.04	\$2.05	\$2.10	\$1.89
2021	\$2.05	\$2.06	\$2.06	\$1.94
2022	\$2.16	\$2.17	\$2.16	\$2.03
2023	\$2.42	\$2.43	\$2.44	\$2.29
2024	\$2.71	\$2.72	\$2.75	\$2.58
2025	\$2.98	\$2.99	\$3.06	\$2.85
2026	\$3.16	\$3.17	\$3.10	\$3.02
2027	\$3.37	\$3.38	\$3.35	\$3.24
2028	\$3.70	\$3.71	\$3.70	\$3.57
2029	\$4.04	\$4.05	\$4.04	\$3.90
2030	\$4.31	\$4.32	\$4.32	\$4.17
2031	\$4.63	\$4.64	\$4.62	\$4.48
2032	\$4.91	\$4.92	\$4.87	\$4.76
2033	\$4.98	\$4.99	\$4.94	\$4.83
2034	\$5.26	\$5.27	\$5.26	\$5.10
2035	\$5.48	\$5.49	\$5.43	\$5.32
2036	\$5.55	\$5.56	\$5.45	\$5.39
2037	\$5.95	\$5.96	\$5.85	\$5.79
2038	\$6.24	\$6.25	\$6.13	\$6.08
2039	\$6.37	\$6.38	\$6.25	\$6.20
2040	\$6.68	\$6.69	\$6.53	\$6.51

Official Forward Price Curve Forecast dated Sep 30, 2019

Table 5

Utah 2019.Q3_Solar - 80.0 MW and 32.2% CF
 January 2020 through December 2039
 Nominal Avoided Costs Calculated Monthly

15 Year Starting 2020 \$ 12,317,667 \$ 14,696,449 \$ 27,014,117 \$ 2,071,444 \$13.04
 Nominal NPV at 6.92% Discount Rate

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	31.8% CF	Dollars	MWH	31.8% CF
Jan-20	195,513	-	195,513	12,454	15.70
Feb-20	43,563	-	43,563	12,755	3.42
Mar-20	217,376	-	217,376	16,934	12.84
Apr-20	238,651	-	238,651	20,073	11.89
May-20	325,016	-	325,016	27,470	11.83
Jun-20	336,325	-	336,325	25,167	13.36
Jul-20	403,262	-	403,262	25,671	15.71
Aug-20	342,447	-	342,447	23,041	14.86
Sep-20	194,632	-	194,632	21,985	8.85
Oct-20	220,278	-	220,278	18,370	11.99
Nov-20	165,145	-	165,145	12,983	12.72
Dec-20	126,575	-	126,575	9,279	13.64
Jan-21	170,658	-	170,658	12,392	13.77
Feb-21	153,404	-	153,404	12,086	12.69
Mar-21	197,271	-	197,271	16,850	11.71
Apr-21	196,911	-	196,911	19,973	9.86
May-21	302,540	-	302,540	27,333	11.07
Jun-21	301,941	-	301,941	25,042	12.06
Jul-21	363,654	-	363,654	25,543	14.24
Aug-21	349,802	-	349,802	22,926	15.26
Sep-21	281,676	-	281,676	21,875	12.88
Oct-21	209,051	-	209,051	18,278	11.44
Nov-21	162,793	-	162,793	12,918	12.60
Dec-21	135,556	-	135,556	9,233	14.68
Jan-22	178,645	-	178,645	12,330	14.49
Feb-22	107,989	-	107,989	12,026	8.98
Mar-22	232,225	-	232,225	16,765	13.85
Apr-22	198,341	-	198,341	19,873	9.98
May-22	305,160	-	305,160	27,196	11.22
Jun-22	311,060	-	311,060	24,916	12.48
Jul-22	313,904	-	313,904	25,415	12.35
Aug-22	319,291	-	319,291	22,811	14.00
Sep-22	162,274	-	162,274	21,766	7.46
Oct-22	143,472	-	143,472	18,186	7.89
Nov-22	183,772	-	183,772	12,853	14.30
Dec-22	128,966	-	128,966	9,186	14.04
Jan-23	173,116	-	173,116	12,268	14.11
Feb-23	140,855	-	140,855	11,966	11.77
Mar-23	140,471	-	140,471	16,681	8.42
Apr-23	117,104	-	117,104	19,774	5.92
May-23	303,561	-	303,561	27,060	11.22
Jun-23	287,702	-	287,702	24,792	11.60
Jul-23	346,398	-	346,398	25,288	13.70
Aug-23	325,159	-	325,159	22,697	14.33
Sep-23	270,984	-	270,984	21,657	12.51
Oct-23	136,345	-	136,345	18,095	7.53
Nov-23	176,634	-	176,634	12,789	13.81
Dec-23	121,549	-	121,549	9,140	13.30
Jan-24	94,560	186,964	281,524	12,207	23.06
Feb-24	(52,246)	186,964	134,718	12,502	10.78

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	31.8% CF	Dollars	MWH	31.8% CF
Mar-24	(61,155)	186,964	125,809	16,598	7.58
Apr-24	(112,251)	186,964	74,714	19,675	3.80
May-24	(18,561)	186,964	168,403	26,925	6.25
Jun-24	91,950	186,964	278,915	24,668	11.31
Jul-24	194,667	186,964	381,631	25,162	15.17
Aug-24	23,525	186,964	210,489	22,584	9.32
Sep-24	(149,199)	186,964	37,766	21,549	1.75
Oct-24	(59,417)	186,964	127,548	18,005	7.08
Nov-24	16,656	186,964	203,620	12,725	16.00
Dec-24	21,721	186,964	208,686	9,095	22.95
Jan-25	64,850	191,122	255,972	12,146	21.07
Feb-25	(112,590)	191,122	78,532	11,847	6.63
Mar-25	(41,481)	191,122	149,641	16,515	9.06
Apr-25	(159,989)	191,122	31,133	19,577	1.59
May-25	64,857	191,122	255,979	26,790	9.55
Jun-25	69,802	191,122	260,923	24,544	10.63
Jul-25	105,844	191,122	296,965	25,036	11.86
Aug-25	125,869	191,122	316,991	22,471	14.11
Sep-25	(138,342)	191,122	52,780	21,441	2.46
Oct-25	(50,286)	191,122	140,835	17,915	7.86
Nov-25	6,835	191,122	197,957	12,661	15.63
Dec-25	32,673	191,122	223,794	9,049	24.73
Jan-26	31,498	195,344	226,842	12,085	18.77
Feb-26	(52,672)	195,344	142,672	11,787	12.10
Mar-26	(19,921)	195,344	175,423	16,432	10.68
Apr-26	(149,268)	195,344	46,076	19,479	2.37
May-26	76,495	195,344	271,839	26,656	10.20
Jun-26	(28,695)	195,344	166,649	24,422	6.82
Jul-26	158,856	195,344	354,200	24,911	14.22
Aug-26	206,273	195,344	401,617	22,359	17.96
Sep-26	(96,379)	195,344	98,965	21,334	4.64
Oct-26	(58,784)	195,344	136,560	17,825	7.66
Nov-26	128,436	195,344	323,780	12,598	25.70
Dec-26	170,085	195,344	365,429	9,004	40.58
Jan-27	(2,562)	199,691	197,129	12,025	16.39
Feb-27	(34,631)	199,691	165,060	11,728	14.07
Mar-27	(6,790)	199,691	192,901	16,350	11.80
Apr-27	(201,344)	199,691	(1,653)	19,381	(0.09)
May-27	86,432	199,691	286,123	26,523	10.79
Jun-27	(165,077)	199,691	34,614	24,300	1.42
Jul-27	105,428	199,691	305,119	24,786	12.31
Aug-27	(31,338)	199,691	168,352	22,247	7.57
Sep-27	(68,830)	199,691	130,861	21,227	6.16
Oct-27	(40,684)	199,691	159,006	17,736	8.97
Nov-27	(58,893)	199,691	140,798	12,535	11.23
Dec-27	42,897	199,691	242,588	8,959	27.08
Jan-28	89,440	204,182	293,622	11,965	24.54
Feb-28	29,074	204,182	233,256	12,253	19.04
Mar-28	114,980	204,182	319,162	16,269	19.62
Apr-28	(38,858)	204,182	165,323	19,284	8.57
May-28	88,957	204,182	293,139	26,390	11.11
Jun-28	(10,366)	204,182	193,815	24,178	8.02
Jul-28	122,978	204,182	327,160	24,662	13.27
Aug-28	207,909	204,182	412,091	22,136	18.62
Sep-28	32,852	204,182	237,033	21,121	11.22
Oct-28	(59,309)	204,182	144,873	17,648	8.21
Nov-28	74,321	204,182	278,503	12,472	22.33
Dec-28	133,543	204,182	337,725	8,914	37.89
Jan-29	99,115	208,816	307,932	11,905	25.87
Feb-29	22,045	208,816	230,861	11,611	19.88

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	31.8% CF	Dollars	MWH	31.8% CF
Mar-29	10,109	208,816	218,926	16,187	13.52
Apr-29	(247,344)	208,816	(38,528)	19,188	(2.01)
May-29	142,232	208,816	351,048	26,258	13.37
Jun-29	(157,952)	208,816	50,865	24,057	2.11
Jul-29	386,353	208,816	595,170	24,539	24.25
Aug-29	158,716	208,816	367,532	22,025	16.69
Sep-29	87,529	208,816	296,346	21,015	14.10
Oct-29	25,175	208,816	233,992	17,559	13.33
Nov-29	112,686	208,816	321,503	12,410	25.91
Dec-29	88,754	208,816	297,570	8,870	33.55
Jan-30	71,567	213,493	285,059	11,845	24.07
Feb-30	53,349	213,493	266,841	11,553	23.10
Mar-30	(75,826)	213,493	137,666	16,106	8.55
Apr-30	19,827	213,493	233,320	19,092	12.22
May-30	78,711	213,493	292,204	26,127	11.18
Jun-30	(275,222)	213,493	(61,729)	23,937	(2.58)
Jul-30	91,332	213,493	304,824	24,416	12.48
Aug-30	412,970	213,493	626,463	21,915	28.59
Sep-30	(5,173)	213,493	208,320	20,910	9.96
Oct-30	(118,592)	213,493	94,901	17,471	5.43
Nov-30	188,333	213,493	401,825	12,348	32.54
Dec-30	78,088	213,493	291,581	8,825	33.04
Jan-31	178,061	218,169	396,229	11,786	33.62
Feb-31	72,615	218,169	290,783	11,496	25.30
Mar-31	208,514	218,169	426,683	16,026	26.62
Apr-31	28,815	218,169	246,983	18,997	13.00
May-31	(21,581)	218,169	196,588	25,996	7.56
Jun-31	(222,969)	218,169	(4,800)	23,817	(0.20)
Jul-31	254,357	218,169	472,525	24,294	19.45
Aug-31	207,064	218,169	425,233	21,805	19.50
Sep-31	(140,901)	218,169	77,267	20,806	3.71
Oct-31	126,314	218,169	344,482	17,384	19.82
Nov-31	66,862	218,169	285,031	12,286	23.20
Dec-31	25,320	218,169	243,488	8,781	27.73
Jan-32	224,749	222,865	447,615	11,727	38.17
Feb-32	38,977	222,865	261,842	12,010	21.80
Mar-32	135,544	222,865	358,409	15,946	22.48
Apr-32	(84,536)	222,865	138,329	18,902	7.32
May-32	56,393	222,865	279,258	25,866	10.80
Jun-32	(423,121)	222,865	(200,255)	23,698	(8.45)
Jul-32	296,539	222,865	519,405	24,173	21.49
Aug-32	179,514	222,865	402,379	21,696	18.55
Sep-32	34,910	222,865	257,776	20,702	12.45
Oct-32	(90,187)	222,865	132,678	17,297	7.67
Nov-32	100,561	222,865	323,426	12,225	26.46
Dec-32	97,013	222,865	319,878	8,737	36.61
Jan-33	131,689	227,644	359,333	11,668	30.80
Feb-33	85,773	227,644	313,417	11,381	27.54
Mar-33	113,794	227,644	341,439	15,866	21.52
Apr-33	84,263	227,644	311,908	18,807	16.58
May-33	85,851	227,644	313,495	25,737	12.18
Jun-33	28,190	227,644	255,834	23,580	10.85
Jul-33	332,137	227,644	559,781	24,052	23.27
Aug-33	269,577	227,644	497,221	21,588	23.03
Sep-33	76,519	227,644	304,163	20,598	14.77
Oct-33	172,671	227,644	400,315	17,211	23.26
Nov-33	80,793	227,644	308,438	12,164	25.36
Dec-33	194,101	227,644	421,745	8,694	48.51
Jan-34	112,037	232,423	344,461	11,610	29.67
Feb-34	17,523	232,423	249,946	11,324	22.07

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	31.8% CF	Dollars	MWH	31.8% CF
Mar-34	133,248	232,423	365,672	15,787	23.16
Apr-34	94,351	232,423	326,775	18,713	17.46
May-34	109,647	232,423	342,071	25,608	13.36
Jun-34	25,845	232,423	258,268	23,462	11.01
Jul-34	341,319	232,423	573,743	23,931	23.97
Aug-34	261,084	232,423	493,508	21,480	22.98
Sep-34	(14,180)	232,423	218,243	20,495	10.65
Oct-34	154,507	232,423	386,931	17,125	22.59
Nov-34	110,821	232,423	343,245	12,103	28.36
Dec-34	118,382	232,423	350,805	8,650	40.55
Jan-35	146,198	237,305	383,504	11,552	33.20
Feb-35	118,948	237,305	356,253	11,267	31.62
Mar-35	130,310	237,305	367,616	15,708	23.40
Apr-35	75,199	237,305	312,505	18,619	16.78
May-35	151,376	237,305	388,682	25,480	15.25
Jun-35	(188,659)	237,305	48,646	23,344	2.08
Jul-35	352,284	237,305	589,590	23,812	24.76
Aug-35	265,514	237,305	502,819	21,372	23.53
Sep-35	(43,737)	237,305	193,568	20,393	9.49
Oct-35	(73,461)	237,305	163,845	17,039	9.62
Nov-35	125,727	237,305	363,032	12,042	30.15
Dec-35	118,680	237,305	355,985	8,607	41.36
Jan-36	173,114	242,249	415,363	11,494	36.14
Feb-36	123,267	242,249	365,517	11,772	31.05
Mar-36	156,825	242,249	399,074	15,629	25.53
Apr-36	100,985	242,249	343,234	18,526	18.53
May-36	191,077	242,249	433,326	25,353	17.09
Jun-36	225,153	242,249	467,402	23,228	20.12
Jul-36	518,015	242,249	760,265	23,693	32.09
Aug-36	303,033	242,249	545,282	21,266	25.64
Sep-36	215,375	242,249	457,625	20,291	22.55
Oct-36	101,493	242,249	343,742	16,954	20.28
Nov-36	213,244	242,249	455,494	11,982	38.01
Dec-36	158,760	242,249	401,009	8,564	46.83
Jan-37	183,259	247,317	430,576	11,437	37.65
Feb-37	173,681	247,317	420,998	11,155	37.74
Mar-37	167,512	247,317	414,829	15,551	26.68
Apr-37	91,574	247,317	338,890	18,434	18.38
May-37	41,318	247,317	288,635	25,226	11.44
Jun-37	(50,161)	247,317	197,156	23,112	8.53
Jul-37	424,532	247,317	671,848	23,574	28.50
Aug-37	120,279	247,317	367,596	21,159	17.37
Sep-37	(66,435)	247,317	180,882	20,189	8.96
Oct-37	95,399	247,317	342,716	16,869	20.32
Nov-37	181,231	247,317	428,548	11,922	35.95
Dec-37	191,191	247,317	438,508	8,521	51.46
Jan-38	243,246	252,487	495,733	11,380	43.56
Feb-38	211,699	252,487	464,186	11,099	41.82
Mar-38	620,067	252,487	872,554	15,473	56.39
Apr-38	142,063	252,487	394,550	18,342	21.51
May-38	146,646	252,487	399,134	25,100	15.90
Jun-38	242,285	252,487	494,773	22,996	21.52
Jul-38	461,075	252,487	713,562	23,456	30.42
Aug-38	367,253	252,487	619,740	21,053	29.44
Sep-38	217,692	252,487	470,180	20,088	23.41
Oct-38	99,061	252,487	351,548	16,785	20.94
Nov-38	256,040	252,487	508,527	11,863	42.87
Dec-38	188,308	252,487	440,796	8,478	51.99

Table 3
2019 IRP Jim Bridger 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)

2019 IRP Jim Bridger Solar with Storage - 30% Capacity Factor

2016									
2017									
2018			\$24.57			\$0.00			\$24.57
2019			\$25.05			\$0.00			\$25.05
2020			\$25.70			\$0.00			\$25.70
2021			\$26.35			\$0.00			\$26.35
2022			\$27.02			\$0.00			\$27.02
2023			\$27.68			\$0.00			\$27.68
2024	\$1,228	\$62.44	\$28.32	\$0.00	\$34.42	\$0.00	\$34.42	\$90.76	\$90.76
2025		\$63.83	\$28.95	\$0.00	\$35.19	\$0.00	\$35.19	\$92.78	\$92.78
2026		\$65.24	\$29.59	\$0.00	\$35.96	\$0.00	\$35.96	\$94.83	\$94.83
2027		\$66.69	\$30.25	\$0.00	\$36.76	\$0.00	\$36.76	\$96.94	\$96.94
2028		\$68.19	\$30.93	\$0.00	\$37.59	\$0.00	\$37.59	\$99.12	\$99.12
2029		\$69.74	\$31.63	\$0.00	\$38.44	\$0.00	\$38.44	\$101.37	\$101.37
2030		\$71.30	\$32.34	\$0.00	\$39.31	\$0.00	\$39.31	\$103.64	\$103.64
2031		\$72.86	\$33.05	\$0.00	\$40.17	\$0.00	\$40.17	\$105.91	\$105.91
2032		\$74.43	\$33.76	\$0.00	\$41.03	\$0.00	\$41.03	\$108.19	\$108.19
2033		\$76.03	\$34.48	\$0.00	\$41.91	\$0.00	\$41.91	\$110.51	\$110.51
2034		\$77.63	\$35.20	\$0.00	\$42.79	\$0.00	\$42.79	\$112.83	\$112.83
2035		\$79.26	\$35.94	\$0.00	\$43.69	\$0.00	\$43.69	\$115.20	\$115.20
2036		\$80.91	\$36.69	\$0.00	\$44.60	\$0.00	\$44.60	\$117.60	\$117.60
2037		\$82.60	\$37.46	\$0.00	\$45.53	\$0.00	\$45.53	\$120.06	\$120.06
2038		\$84.33	\$38.24	\$0.00	\$46.49	\$0.00	\$46.49	\$122.57	\$122.57
2039		\$86.08	\$39.03	\$0.00	\$47.45	\$0.00	\$47.45	\$125.11	\$125.11
2040		\$87.87	\$39.84	\$0.00	\$48.43	\$0.00	\$48.43	\$127.71	\$127.71
2041		\$89.70	\$40.67	\$0.00	\$49.44	\$0.00	\$49.44	\$130.37	\$130.37
2042		\$91.59	\$41.53	\$0.00	\$50.49	\$0.00	\$50.49	\$133.12	\$133.12
2043		\$93.53	\$42.41	\$0.00	\$51.56	\$0.00	\$51.56	\$135.94	\$135.94

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)	= (c) + (f)
	(i)	Plant Costs - 2019 IRP Update - Table 6.1 & 6.2

2019 IRP Jim Bridger 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	
		Wheeling (\$ MWh)	
2018 \$	\$0.00	Variable O&M	
		Tax Credit \$/MWh	First Year real levelized
2024\$	-	Network Upgrade (\$/kw-yr)	Bridger - to - Bridger West, Recovered Transmission 2024
	5.085%	Payment Factor	includes 30% ITC
	30.1%	Capacity Factor	

Company Official Inflation Forecast Dated September 30, 2019					
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2017	1.9%	2026	2.2%	2035	2.1%
2018	2.4%	2027	2.2%	2036	2.1%
2019	2.0%	2028	2.2%	2037	2.1%
2020	2.6%	2029	2.3%	2038	2.1%
2021	2.5%	2030	2.2%	2039	2.1%
2022	2.5%	2031	2.2%	2040	2.1%
2023	2.5%	2032	2.2%	2041	2.1%
2024	2.3%	2033	2.1%	2042	2.1%
2025	2.2%	2034	2.1%	2043	2.1%

Appendix B.3
Avoided Cost Prices \$/MWh
Utah 2019.Q3 Sch 38

Year	Thermal UT 2019.Q3 85.0% CF (2)	Solar Tracking UT 2019.Q3 31.1% CF (2)	Wind UT 2019.Q3 31.0% CF (2)	Thermal UT 2019.Q2 Filing	Solar Tracking UT 2019.Q2 Filing	Wind UT 2019.Q2 Filing	Thermal Difference	Solar Tracking Difference	Wind Difference
2020	\$15.04	\$12.42	\$14.41	\$18.30	\$17.93	\$14.15	(\$3.26)	(\$5.51)	\$0.26
2021	\$15.18	\$12.59	\$14.34	\$17.22	\$14.91	\$14.16	(\$2.05)	(\$2.32)	\$0.19
2022	\$13.78	\$11.58	\$12.60	\$18.66	\$15.83	\$15.32	(\$4.88)	(\$4.25)	(\$2.72)
2023	\$13.95	\$11.43	\$25.36	\$19.45	\$16.03	\$16.71	(\$5.50)	(\$4.60)	\$8.65
2024	\$9.63	\$10.08	\$26.38	\$21.53	\$17.24	\$18.42	(\$11.90)	(\$7.16)	\$7.96
2025	\$10.65	\$10.28	\$26.69	\$24.16	\$20.64	\$22.75	(\$13.52)	(\$10.36)	\$3.94
2026	\$27.01	\$12.38	\$27.80	\$28.65	\$22.28	\$26.00	(\$1.64)	(\$9.90)	\$1.80
2027	\$26.59	\$9.28	\$28.14	\$30.06	\$23.01	\$27.27	(\$3.46)	(\$13.73)	\$0.87
2028	\$33.51	\$14.89	\$29.30	\$33.32	\$25.32	\$31.05	\$0.19	(\$10.43)	(\$1.75)
2029	\$37.57	\$14.99	\$29.79	\$37.24	\$29.87	\$35.04	\$0.33	(\$14.88)	(\$5.25)
2030	\$36.41	\$14.36	\$30.22	\$41.89	\$34.20	\$50.11	(\$5.47)	(\$19.84)	(\$19.90)
2031	\$38.06	\$15.93	\$31.44	\$45.71	\$37.22	\$50.02	(\$7.64)	(\$21.29)	(\$18.58)
2032	\$43.45	\$15.22	\$31.82	\$47.92	\$39.40	\$50.09	(\$4.47)	(\$24.19)	(\$18.27)
2033	\$44.82	\$20.76	\$58.97	\$53.47	\$43.49	\$52.81	(\$8.64)	(\$22.73)	\$6.16
2034	\$46.37	\$20.23	\$59.83	\$56.08	\$44.70	\$53.73	(\$9.71)	(\$24.47)	\$6.11

2020-2034	15-Year Levelized Prices (Nominal) @ 6.920% Discount Rate (1) (3)	\$/MWh	\$24.08	\$13.04	\$26.60	\$29.35	\$23.89	\$27.79	(\$5.27)	(\$10.85)	(\$1.19)
							-18%	-45%	-4%		

Footnotes:

- (1) Discount Rate - 2019 IRP Update
- (2) Total Avoided Costs with Capacity, based on stated CF
- (3) 15-Years: 2020 - 2034, levelized monthly

Table 1
Avoided Cost Prices
Utah 2019.Q3_Wind - 69.2 MW and 29.4% CF

Total Price @

Year	Capacity Price \$/kW-yr	Energy Only Price \$/MWh ⁽²⁾	29.4% Capacity Factor \$/MWh
2020	\$0.00	\$14.41	\$14.41
2021	\$0.00	\$14.34	\$14.34
2022	\$0.00	\$12.60	\$12.60
2023	\$121.11	(\$21.58)	\$25.36
2024	\$123.91	(\$21.61)	\$26.38
2025	\$126.69	(\$22.41)	\$26.69
2026	\$129.49	(\$22.39)	\$27.80
2027	\$132.38	(\$23.17)	\$28.14
2028	\$135.37	(\$23.13)	\$29.30
2029	\$138.45	(\$23.88)	\$29.79
2030	\$141.58	(\$24.66)	\$30.22
2031	\$144.71	(\$24.65)	\$31.44
2032	\$147.89	(\$25.46)	\$31.82
2033	\$151.11	\$0.40	\$58.97
2034	\$154.36	\$0.00	\$59.83
2035	\$157.68	\$0.00	\$61.11
2036	\$161.05	\$0.01	\$62.38
2037	\$164.48	\$0.00	\$63.75
2038	\$168.01	(\$0.00)	\$65.12
2039	\$171.49	(\$0.00)	\$66.47

15 Year Starting 2023

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

\$/kW	\$137.49		
\$/MWh		(\$17.74)	\$35.66

15 Year Starting 2020

20 year Levelized Prices (Nominal) @ 0.00% Discount Rate (1) (3)

\$/kW	\$95.64		
\$/MWh		(\$10.54)	\$26.60

Footnotes:

(1) Discount Rate - 2019 IRP Update

(2) 'Energy Only' is the GRID calculated costs and includes some capacity costs.

Table 2
Avoided Energy Costs - Scheduled Hours (\$/MWh)
Utah 2019.Q3_Wind - 69.2 MW and 29.4% CF

Year	Annual	Winter Season					Summer Season				Winter Season		
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Energy Only													
2020	14.41	11.87	13.01	16.19	12.92	12.85	14.27	22.92	22.91	11.85	12.38	14.39	13.48
2021	14.34	13.68	16.78	15.09	12.39	12.62	13.33	17.66	20.02	15.43	13.96	9.41	15.19
2022	12.60	13.43	12.94	15.76	10.81	11.72	13.19	16.52	16.64	3.36	10.58	12.64	12.87
2023	(21.58)	(21.48)	(21.48)	(21.72)	(21.75)	(21.48)	(21.53)	(21.72)	(21.59)	(21.55)	(21.66)	(21.48)	(21.48)
2024	(21.61)	(21.48)	(21.59)	(21.84)	(21.84)	(21.48)	(21.70)	(21.48)	(21.49)	(21.48)	(21.70)	(21.51)	(21.48)
2025	(22.41)	(22.28)	(22.29)	(22.69)	(22.65)	(22.28)	(22.42)	(22.30)	(22.30)	(22.30)	(22.46)	(22.47)	(22.28)
2026	(22.39)	(22.28)	(22.29)	(22.45)	(22.77)	(22.33)	(22.43)	(22.38)	(22.29)	(22.42)	(22.42)	(22.28)	(22.28)
2027	(23.17)	(23.07)	(23.07)	(23.18)	(23.55)	(23.07)	(23.13)	(23.29)	(23.07)	(23.16)	(23.26)	(23.07)	(23.07)
2028	(23.13)	(23.07)	(23.07)	(23.14)	(23.31)	(23.07)	(23.07)	(23.20)	(23.07)	(23.07)	(23.27)	(23.07)	(23.07)
2029	(23.88)	(23.87)	(23.86)	(23.89)	(23.92)	(23.87)	(23.87)	(23.87)	(23.87)	(23.87)	(23.87)	(23.87)	(23.87)
2030	(24.66)	(24.67)	(24.67)	(24.59)	(24.67)	(24.67)	(24.67)	(24.67)	(24.67)	(24.67)	(24.67)	(24.67)	(24.67)
2031	(24.65)	(24.67)	(24.67)	(24.59)	(24.67)	(24.67)	(24.67)	(24.67)	(24.67)	(24.67)	(24.67)	(24.61)	(24.67)
2032	(25.46)	(25.46)	(25.46)	(25.44)	(25.46)	(25.46)	(25.46)	(25.46)	(25.46)	(25.46)	(25.46)	(25.46)	(25.46)
2033	0.40	(0.00)	0.00	0.01	0.61	(0.00)	0.00	(0.00)	(0.00)	0.00	3.96	(0.00)	0.00
2034	0.00	0.00	0.00	0.00	(0.00)	0.00	0.00	0.00	(0.00)	0.00	(0.01)	0.02	(0.00)
2035	0.00	0.00	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00
2036	0.01	(0.00)	0.05	0.01	0.00	(0.00)	0.00	0.00	0.00	0.00	0.00	(0.00)	(0.00)
2037	0.00	(0.00)	0.00	0.00	0.00	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)	(0.00)	0.00

Table 4
Burnertip Natural Gas Price Forecast
Utah 2019.Q3_Wind - 69.2 MW and 29.4% 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	\$2.35	\$2.36	\$4.15	\$2.10
2020	\$2.04	\$2.05	\$2.10	\$1.89
2021	\$2.05	\$2.06	\$2.06	\$1.94
2022	\$2.16	\$2.17	\$2.16	\$2.03
2023	\$2.42	\$2.43	\$2.44	\$2.29
2024	\$2.71	\$2.72	\$2.75	\$2.58
2025	\$2.98	\$2.99	\$3.06	\$2.85
2026	\$3.16	\$3.17	\$3.10	\$3.02
2027	\$3.37	\$3.38	\$3.35	\$3.24
2028	\$3.70	\$3.71	\$3.70	\$3.57
2029	\$4.04	\$4.05	\$4.04	\$3.90
2030	\$4.31	\$4.32	\$4.32	\$4.17
2031	\$4.63	\$4.64	\$4.62	\$4.48
2032	\$4.91	\$4.92	\$4.87	\$4.76
2033	\$4.98	\$4.99	\$4.94	\$4.83
2034	\$5.26	\$5.27	\$5.26	\$5.10
2035	\$5.48	\$5.49	\$5.43	\$5.32
2036	\$5.55	\$5.56	\$5.45	\$5.39
2037	\$5.95	\$5.96	\$5.85	\$5.79
2038	\$6.24	\$6.25	\$6.13	\$6.08
2039	\$6.37	\$6.38	\$6.25	\$6.20
2040	\$6.68	\$6.69	\$6.53	\$6.51

Official Forward Price Curve Forecast dated Sep 30, 2019

Table 5

**Utah 2019.Q3_Wind - 69.2 MW and 29.4% CF
January 2020 through December 2039**

Nominal Avoided Costs Calculated Monthly

15 Year Starting 2020	\$	(17,826,461)	\$	62,816,869	\$	44,990,408	\$	1,691,351	\$26.60
Nominal NPV at 6.92% Discount Rate									
15 Year Starting 2023	\$	(29,996,479)	\$	90,303,256	\$	60,306,777	\$	1,691,326	\$35.66

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	29.4% CF	Dollars	MWH	29.4% CF
Jan-20	216,719	-	216,719	18,252	11.87
Feb-20	226,744	-	226,744	17,429	13.01
Mar-20	354,937	-	354,937	21,928	16.19
Apr-20	228,741	-	228,741	17,711	12.92
May-20	227,746	-	227,746	17,724	12.85
Jun-20	204,134	-	204,134	14,306	14.27
Jul-20	238,444	-	238,444	10,405	22.92
Aug-20	190,474	-	190,474	8,313	22.91
Sep-20	128,196	-	128,196	10,821	11.85
Oct-20	187,789	-	187,789	15,165	12.38
Nov-20	191,063	-	191,063	13,278	14.39
Dec-20	179,888	-	179,888	13,347	13.48
Jan-21	249,690	-	249,690	18,252	13.68
Feb-21	290,085	-	290,085	17,289	16.78
Mar-21	330,955	-	330,955	21,928	15.09
Apr-21	219,375	-	219,375	17,711	12.39
May-21	223,626	-	223,626	17,724	12.62
Jun-21	190,652	-	190,652	14,306	13.33
Jul-21	183,734	-	183,734	10,405	17.66
Aug-21	166,398	-	166,398	8,313	20.02
Sep-21	167,002	-	167,002	10,821	15.43
Oct-21	211,730	-	211,730	15,165	13.96
Nov-21	124,997	-	124,997	13,278	9.41
Dec-21	202,730	-	202,730	13,347	15.19
Jan-22	245,076	-	245,076	18,252	13.43
Feb-22	223,646	-	223,646	17,289	12.94
Mar-22	345,541	-	345,541	21,928	15.76
Apr-22	191,375	-	191,375	17,711	10.81
May-22	207,737	-	207,737	17,724	11.72
Jun-22	188,762	-	188,762	14,306	13.19
Jul-22	171,846	-	171,846	10,405	16.52
Aug-22	138,288	-	138,288	8,313	16.64
Sep-22	36,398	-	36,398	10,821	3.36
Oct-22	160,508	-	160,508	15,165	10.58
Nov-22	167,863	-	167,863	13,278	12.64
Dec-22	171,805	-	171,805	13,347	12.87
Jan-23	(392,047)	698,413	306,367	18,252	16.79
Feb-23	(371,359)	698,413	327,054	17,289	18.92
Mar-23	(476,195)	698,413	222,218	21,928	10.13
Apr-23	(385,256)	698,413	313,158	17,711	17.68
May-23	(380,711)	698,413	317,703	17,724	17.93
Jun-23	(308,001)	698,413	390,412	14,306	27.29
Jul-23	(226,037)	698,413	472,376	10,405	45.40
Aug-23	(179,488)	698,413	518,925	8,313	62.43
Sep-23	(233,191)	698,413	465,222	10,821	42.99
Oct-23	(328,421)	698,413	369,992	15,165	24.40
Nov-23	(285,207)	698,413	413,207	13,278	31.12
Dec-23	(286,704)	698,413	411,709	13,347	30.85
Jan-24	(392,047)	714,562	322,515	18,252	17.67

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	29.4% CF	Dollars	MWH	29.4% CF
Feb-24	(376,333)	714,562	338,229	17,429	19.41
Mar-24	(478,900)	714,562	235,662	21,928	10.75
Apr-24	(386,746)	714,562	327,816	17,711	18.51
May-24	(380,710)	714,562	333,852	17,724	18.84
Jun-24	(310,412)	714,562	404,150	14,306	28.25
Jul-24	(223,491)	714,562	491,071	10,405	47.20
Aug-24	(178,656)	714,562	535,906	8,313	64.47
Sep-24	(232,440)	714,562	482,122	10,821	44.55
Oct-24	(329,114)	714,562	385,448	15,165	25.42
Nov-24	(285,545)	714,562	429,016	13,278	32.31
Dec-24	(286,704)	714,562	427,858	13,347	32.06
Jan-25	(406,611)	730,556	323,945	18,252	17.75
Feb-25	(385,371)	730,556	345,185	17,289	19.97
Mar-25	(497,481)	730,556	233,076	21,928	10.63
Apr-25	(401,225)	730,556	329,331	17,711	18.60
May-25	(394,854)	730,556	335,703	17,724	18.94
Jun-25	(320,768)	730,556	409,789	14,306	28.64
Jul-25	(232,064)	730,556	498,492	10,405	47.91
Aug-25	(185,340)	730,556	545,217	8,313	65.59
Sep-25	(241,315)	730,556	489,242	10,821	45.21
Oct-25	(340,608)	730,556	389,949	15,165	25.71
Nov-25	(298,388)	730,556	432,169	13,278	32.55
Dec-25	(297,355)	730,556	433,201	13,347	32.46
Jan-26	(406,612)	746,750	340,138	18,252	18.64
Feb-26	(385,278)	746,750	361,471	17,289	20.91
Mar-26	(492,265)	746,750	254,485	21,928	11.61
Apr-26	(403,314)	746,750	343,436	17,711	19.39
May-26	(395,774)	746,750	350,976	17,724	19.80
Jun-26	(320,907)	746,750	425,843	14,306	29.77
Jul-26	(232,868)	746,750	513,882	10,405	49.39
Aug-26	(185,294)	746,750	561,456	8,313	67.54
Sep-26	(242,641)	746,750	504,109	10,821	46.59
Oct-26	(339,980)	746,750	406,770	15,165	26.82
Nov-26	(295,803)	746,750	450,947	13,278	33.96
Dec-26	(297,355)	746,750	449,395	13,347	33.67
Jan-27	(421,067)	763,373	342,306	18,252	18.75
Feb-27	(398,849)	763,373	364,524	17,289	21.08
Mar-27	(508,212)	763,373	255,161	21,928	11.64
Apr-27	(417,090)	763,373	346,283	17,711	19.55
May-27	(408,891)	763,373	354,482	17,724	20.00
Jun-27	(330,937)	763,373	432,436	14,306	30.23
Jul-27	(242,290)	763,373	521,083	10,405	50.08
Aug-27	(191,774)	763,373	571,599	8,313	68.76
Sep-27	(250,650)	763,373	512,723	10,821	47.38
Oct-27	(352,788)	763,373	410,585	15,165	27.07
Nov-27	(306,319)	763,373	457,054	13,278	34.42
Dec-27	(307,927)	763,373	455,446	13,347	34.12
Jan-28	(421,068)	780,624	359,557	18,252	19.70
Feb-28	(402,096)	780,624	378,529	17,429	21.72
Mar-28	(507,485)	780,624	273,139	21,928	12.46
Apr-28	(412,797)	780,624	367,827	17,711	20.77
May-28	(408,893)	780,624	371,732	17,724	20.97
Jun-28	(330,040)	780,624	450,584	14,306	31.50
Jul-28	(241,363)	780,624	539,261	10,405	51.83
Aug-28	(191,774)	780,624	588,850	8,313	70.84
Sep-28	(249,646)	780,624	530,979	10,821	49.07
Oct-28	(352,832)	780,624	427,792	15,165	28.21
Nov-28	(306,318)	780,624	474,307	13,278	35.72
Dec-28	(307,926)	780,624	472,698	13,347	35.41
Jan-29	(435,633)	798,421	362,788	18,252	19.88

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	29.4% CF	Dollars	MWH	29.4% CF
Feb-29	(412,447)	798,421	385,974	17,289	22.33
Mar-29	(523,969)	798,421	274,452	21,928	12.52
Apr-29	(423,599)	798,421	374,822	17,711	21.16
May-29	(423,036)	798,421	375,385	17,724	21.18
Jun-29	(341,451)	798,421	456,970	14,306	31.94
Jul-29	(248,338)	798,421	550,083	10,405	52.87
Aug-29	(198,409)	798,421	600,012	8,313	72.18
Sep-29	(258,282)	798,421	540,139	10,821	49.91
Oct-29	(361,970)	798,421	436,451	15,165	28.78
Nov-29	(316,914)	798,421	481,507	13,278	36.26
Dec-29	(318,578)	798,421	479,843	13,347	35.95
Jan-30	(450,197)	816,416	366,219	18,252	20.06
Feb-30	(426,447)	816,416	389,970	17,289	22.56
Mar-30	(539,192)	816,416	277,224	21,928	12.64
Apr-30	(436,853)	816,416	379,563	17,711	21.43
May-30	(437,179)	816,416	379,237	17,724	21.40
Jun-30	(352,867)	816,416	463,549	14,306	32.40
Jul-30	(256,639)	816,416	559,777	10,405	53.80
Aug-30	(205,040)	816,416	611,377	8,313	73.55
Sep-30	(266,916)	816,416	549,500	10,821	50.78
Oct-30	(374,164)	816,416	442,252	15,165	29.16
Nov-30	(327,509)	816,416	488,907	13,278	36.82
Dec-30	(329,226)	816,416	487,191	13,347	36.50
Jan-31	(450,197)	834,521	384,324	18,252	21.06
Feb-31	(426,441)	834,521	408,080	17,289	23.60
Mar-31	(539,307)	834,521	295,214	21,928	13.46
Apr-31	(436,853)	834,521	397,668	17,711	22.45
May-31	(437,180)	834,521	397,342	17,724	22.42
Jun-31	(352,866)	834,521	481,655	14,306	33.67
Jul-31	(256,639)	834,521	577,882	10,405	55.54
Aug-31	(205,042)	834,521	629,479	8,313	75.73
Sep-31	(266,916)	834,521	567,605	10,821	52.45
Oct-31	(374,072)	834,521	460,449	15,165	30.36
Nov-31	(326,748)	834,521	507,773	13,278	38.24
Dec-31	(329,228)	834,521	505,293	13,347	37.86
Jan-32	(464,652)	852,825	388,173	18,252	21.27
Feb-32	(443,831)	852,825	408,994	17,429	23.47
Mar-32	(557,935)	852,825	294,890	21,928	13.45
Apr-32	(450,879)	852,825	401,945	17,711	22.70
May-32	(451,215)	852,825	401,610	17,724	22.66
Jun-32	(364,196)	852,825	488,629	14,306	34.16
Jul-32	(264,877)	852,825	587,947	10,405	56.51
Aug-32	(211,623)	852,825	641,202	8,313	77.14
Sep-32	(275,486)	852,825	577,339	10,821	53.35
Oct-32	(386,083)	852,825	466,742	15,165	30.78
Nov-32	(338,025)	852,825	514,800	13,278	38.77
Dec-32	(339,800)	852,825	513,025	13,347	38.44
Jan-33	(2)	871,385	871,384	18,252	47.74
Feb-33	1	871,385	871,386	17,289	50.40
Mar-33	186	871,385	871,571	21,928	39.75
Apr-33	10,725	871,385	882,110	17,711	49.81
May-33	(0)	871,385	871,385	17,724	49.16
Jun-33	2	871,385	871,387	14,306	60.91
Jul-33	(1)	871,385	871,384	10,405	83.75
Aug-33	(1)	871,385	871,384	8,313	104.83
Sep-33	0	871,385	871,385	10,821	80.53
Oct-33	60,024	871,385	931,409	15,165	61.42
Nov-33	(1)	871,385	871,384	13,278	65.63
Dec-33	0	871,385	871,385	13,347	65.28
Jan-34	0	890,170	890,171	18,252	48.77

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	29.4% CF	Dollars	MWH	29.4% CF
Feb-34	52	890,170	890,222	17,289	51.49
Mar-34	78	890,170	890,248	21,928	40.60
Apr-34	(0)	890,170	890,170	17,711	50.26
May-34	0	890,170	890,170	17,724	50.22
Jun-34	1	890,170	890,171	14,306	62.22
Jul-34	1	890,170	890,171	10,405	85.56
Aug-34	(1)	890,170	890,170	8,313	107.09
Sep-34	1	890,170	890,171	10,821	82.26
Oct-34	(129)	890,170	890,041	15,165	58.69
Nov-34	297	890,170	890,468	13,278	67.06
Dec-34	(0)	890,170	890,170	13,347	66.69
Jan-35	10	909,270	909,279	18,252	49.82
Feb-35	39	909,270	909,309	17,289	52.60
Mar-35	93	909,270	909,363	21,928	41.47
Apr-35	0	909,270	909,270	17,711	51.34
May-35	(1)	909,270	909,269	17,724	51.30
Jun-35	(0)	909,270	909,269	14,306	63.56
Jul-35	0	909,270	909,270	10,405	87.39
Aug-35	1	909,270	909,271	8,313	109.38
Sep-35	1	909,270	909,270	10,821	84.03
Oct-35	(0)	909,270	909,270	15,165	59.96
Nov-35	(1)	909,270	909,269	13,278	68.48
Dec-35	0	909,270	909,270	13,347	68.12
Jan-36	(6)	928,709	928,704	18,252	50.88
Feb-36	835	928,709	929,544	17,429	53.33
Mar-36	188	928,709	928,897	21,928	42.36
Apr-36	0	928,709	928,709	17,711	52.44
May-36	(1)	928,709	928,709	17,724	52.40
Jun-36	1	928,709	928,710	14,306	64.92
Jul-36	0	928,709	928,709	10,405	89.26
Aug-36	2	928,709	928,711	8,313	111.72
Sep-36	1	928,709	928,710	10,821	85.82
Oct-36	1	928,709	928,710	15,165	61.24
Nov-36	(0)	928,709	928,709	13,278	69.94
Dec-36	(1)	928,709	928,708	13,347	69.58
Jan-37	(0)	948,521	948,520	18,252	51.97
Feb-37	1	948,521	948,522	17,289	54.86
Mar-37	0	948,521	948,521	21,928	43.26
Apr-37	1	948,521	948,522	17,711	53.56
May-37	1	948,521	948,521	17,724	53.52
Jun-37	(0)	948,521	948,521	14,306	66.30
Jul-37	3	948,521	948,524	10,405	91.16
Aug-37	(1)	948,521	948,520	8,313	114.11
Sep-37	0	948,521	948,521	10,821	87.65
Oct-37	(1)	948,521	948,520	15,165	62.54
Nov-37	(0)	948,521	948,521	13,278	71.44
Dec-37	1	948,521	948,522	13,347	71.06
Jan-38	(1)	968,845	968,844	18,252	53.08
Feb-38	(0)	968,845	968,845	17,289	56.04
Mar-38	0	968,845	968,845	21,928	44.18
Apr-38	(1)	968,845	968,844	17,711	54.70
May-38	0	968,845	968,845	17,724	54.66
Jun-38	(0)	968,845	968,845	14,306	67.72
Jul-38	(5)	968,845	968,840	10,405	93.12
Aug-38	1	968,845	968,847	8,313	116.55
Sep-38	1	968,845	968,846	10,821	89.53
Oct-38	(0)	968,845	968,845	15,165	63.88
Nov-38	1	968,845	968,846	13,278	72.97
Dec-38	(0)	968,845	968,845	13,347	72.59

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)
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		\$89.34	\$33.07	\$1.50	\$47.95	(\$21.48)	\$26.47	\$68.40	\$123.91
2025		\$91.33	\$33.83	\$1.53	\$49.02	(\$22.28)	\$26.75	\$69.12	\$126.69
2026		\$93.34	\$34.59	\$1.56	\$50.11	(\$22.28)	\$27.83	\$71.92	\$129.49
2027		\$95.41	\$35.38	\$1.59	\$51.23	(\$23.07)	\$28.16	\$72.76	\$132.38
2028		\$97.55	\$36.19	\$1.63	\$52.38	(\$23.07)	\$29.31	\$75.75	\$135.37
2029		\$99.77	\$37.01	\$1.67	\$53.58	(\$23.87)	\$29.71	\$76.77	\$138.45
2030		\$102.01	\$37.86	\$1.71	\$54.78	(\$24.67)	\$30.12	\$77.83	\$141.58
2031		\$104.24	\$38.72	\$1.75	\$56.00	(\$24.67)	\$31.33	\$80.97	\$144.71
2032		\$106.49	\$39.61	\$1.79	\$57.23	(\$25.46)	\$31.77	\$82.10	\$147.89
2033		\$108.77	\$40.51	\$1.83	\$58.47	\$0.00	\$58.47	\$151.11	\$151.11
2034		\$111.06	\$41.43	\$1.87	\$59.73	\$0.00	\$59.73	\$154.36	\$154.36
2035		\$113.39	\$42.38	\$1.91	\$61.02	\$0.00	\$61.02	\$157.68	\$157.68
2036		\$115.75	\$43.35	\$1.95	\$62.32	\$0.00	\$62.32	\$161.05	\$161.05
2037		\$118.16	\$44.33	\$1.99	\$63.65	\$0.00	\$63.65	\$164.48	\$164.48
2038		\$120.63	\$45.35	\$2.03	\$65.01	\$0.00	\$65.01	\$168.01	\$168.01
2039		\$123.13	\$46.29	\$2.07	\$66.36	\$0.00	\$66.36	\$171.49	\$171.49
2040		\$125.68	\$47.25	\$2.11	\$67.73	\$0.00	\$67.73	\$175.04	\$175.04
2041		\$128.30	\$48.24	\$2.15	\$69.15	\$0.00	\$69.15	\$178.69	\$178.69
2042		\$131.00	\$49.26	\$2.20	\$70.61	\$0.00	\$70.61	\$182.46	\$182.46
2043		\$133.78	\$50.30	\$2.25	\$72.10	\$0.00	\$72.10	\$186.33	\$186.33

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	1.9%	2026	2.2%	2035	2.1%
2018	2.4%	2027	2.2%	2036	2.1%
2019	2.0%	2028	2.2%	2037	2.1%
2020	2.6%	2029	2.3%	2038	2.1%
2021	2.5%	2030	2.2%	2039	2.1%
2022	2.5%	2031	2.2%	2040	2.1%
2023	2.5%	2032	2.2%	2041	2.1%
2024	2.3%	2033	2.1%	2042	2.1%
2025	2.2%	2034	2.1%	2043	2.1%

ROCKY MOUNTAIN POWER

STEP STUDY BETWEEN PRIOR FILING AND CURRENT FILING

2019.Q3 – December 2019

2020 - 2034, Nominal Levelized Payment at 6.920% Discount Rate

	2020 - 2034	2021 - 2035	2022 - 2036
2019.Q2 As Filed	\$29.37	\$31.81	\$34.60
OFPC	-\$2.59	-\$2.68	-\$2.85
Queue	-\$0.41	-\$0.42	-\$0.42
IRP19	-\$2.27	-\$2.64	-\$3.07
2019.Q3 As Filed	\$24.10	\$26.07	\$28.26

Appendix C

Utah Quarterly Compliance Filing Step Study between 2019.Q3 and 2019.Q2 Compliance Filing Avoided Cost Impact of Changing Assumptions \$/MWH (1)

Year	OFPC (2)	Queue	IRP19	Total Impact
2020	\$ (2.36)	\$ (0.23)	\$ (0.67)	\$ (3.26)
2021	\$ (1.78)	\$ (0.33)	\$ 0.06	\$ (2.05)
2022	\$ (1.90)	\$ (0.34)	\$ (2.64)	\$ (4.88)
2023	\$ (1.34)	\$ (0.21)	\$ (3.96)	\$ (5.50)
2024	\$ (1.71)	\$ (0.39)	\$ (9.80)	\$ (11.90)
2025	\$ (2.98)	\$ (0.76)	\$ (9.78)	\$ (13.52)
2026	\$ (7.55)	\$ (0.15)	\$ 6.05	\$ (1.64)
2027	\$ (2.53)	\$ (0.30)	\$ (0.64)	\$ (3.46)
2028	\$ (5.62)	\$ (0.70)	\$ 6.50	\$ 0.19
2029	\$ (1.99)	\$ (0.58)	\$ 2.91	\$ 0.33
2030	\$ (0.87)	\$ (0.51)	\$ (4.10)	\$ (5.47)
2031	\$ (1.51)	\$ (0.77)	\$ (5.37)	\$ (7.64)
2032	\$ (1.64)	\$ (0.58)	\$ (2.25)	\$ (4.47)
2033	\$ (2.68)	\$ (0.26)	\$ (5.71)	\$ (8.64)
2034	\$ (2.87)	\$ (0.41)	\$ (6.43)	\$ (9.71)
2035	\$ (4.09)	\$ (0.21)	\$ (7.05)	\$ (11.35)
2036	\$ (4.60)	\$ (0.25)	\$ (6.06)	\$ (10.91)

Nominal Levelized Payment at 6.920% Discount Rate (3)

2020 - 2034	\$ (2.59)	\$ (0.41)	\$ (2.27)	\$ (5.27)
2021 - 2035	\$ (2.68)	\$ (0.42)	\$ (2.64)	\$ (5.74)
2022 - 2036	\$ (2.85)	\$ (0.42)	\$ (3.07)	\$ (6.34)

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

Appendix C

**Utah Quarterly Compliance Filing
Step Study between 2019.Q3 and 2019.Q2 Compliance Filing
Total Avoided Cost Prices \$/MWH (1) (4)**

Year	2019.Q2 As Filed	OFPC (2)	Queue	IRP19
2020	\$18.30	\$15.94	\$15.71	\$15.04
2021	\$17.22	\$15.45	\$15.12	\$15.18
2022	\$18.66	\$16.76	\$16.42	\$13.78
2023	\$19.45	\$18.11	\$17.90	\$13.95
2024	\$21.53	\$19.82	\$19.43	\$9.63
2025	\$24.16	\$21.19	\$20.43	\$10.65
2026	\$28.65	\$21.10	\$20.96	\$27.01
2027	\$30.06	\$27.53	\$27.24	\$26.59
2028	\$33.32	\$27.71	\$27.01	\$33.51
2029	\$37.24	\$35.25	\$34.67	\$37.57
2030	\$41.89	\$41.01	\$40.51	\$36.41
2031	\$45.71	\$44.20	\$43.43	\$38.06
2032	\$47.92	\$46.28	\$45.70	\$43.45
2033	\$53.47	\$50.79	\$50.53	\$44.82
2034	\$56.08	\$53.22	\$52.81	\$46.37
2035	\$59.90	\$55.81	\$55.60	\$48.55
2036	\$61.91	\$57.31	\$57.06	\$51.00

Nominal Levelized Payment at 6.920% Discount Rate (3)

2020 - 2034	\$29.37	\$26.78	\$26.37	\$24.10
2021 - 2035	\$31.81	\$29.13	\$28.71	\$26.07
2022 - 2036	\$34.60	\$31.75	\$31.33	\$28.26

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

Appendix C

**Utah Quarterly Compliance Filing
Step Study between 2019.Q3 and 2019.Q2 Compliance Filing
GRID Calculated Energy Avoided Cost Prices \$/MWH (1)**

Year	2019.Q2 As Filed	OFPC (2)	Queue	IRP19
2020	\$18.30	\$15.94	\$15.71	\$15.04
2021	\$17.22	\$15.45	\$15.12	\$15.18
2022	\$18.66	\$16.76	\$16.42	\$13.78
2023	\$19.45	\$18.11	\$17.90	\$13.95
2024	\$21.53	\$19.82	\$19.43	\$9.63
2025	\$24.16	\$21.19	\$20.43	\$10.65
2026	\$28.65	\$21.10	\$20.96	\$14.17
2027	\$30.06	\$27.53	\$27.24	\$13.47
2028	\$33.32	\$27.71	\$27.01	\$20.13
2029	\$37.24	\$35.25	\$34.67	\$23.85
2030	\$41.89	\$41.01	\$40.51	\$22.38
2031	\$45.71	\$44.20	\$43.43	\$23.73
2032	\$47.92	\$46.28	\$45.70	\$28.84
2033	\$53.47	\$50.79	\$50.53	\$29.87
2034	\$56.08	\$53.22	\$52.81	\$31.10
2035	\$59.90	\$55.81	\$55.60	\$32.95
2036	\$61.91	\$57.31	\$57.06	\$35.13

Nominal Levelized Payment at 6.92% Discount Rate (3)

2020 - 2034	\$29.37	\$26.78	\$26.37	\$17.46
2021 - 2035	\$31.81	\$29.13	\$28.71	\$18.35
2022 - 2036	\$34.61	\$31.75	\$31.33	\$19.36

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

Appendix C

**Utah Quarterly Compliance Filing
Step Study between 2019.Q3 and 2019.Q2 Compliance Filing
Capacity Avoided Cost Prices**

Year	\$/kW-Year		\$/MWH (1)	
	2019.Q2 (3)	2019.Q3 (3)	2019.Q2 (3)	2019.Q3 (3)
2020	-	-	-	-
2021	-	-	-	-
2022	-	-	-	-
2023	-	-	-	-
2024	-	-	-	-
2025	-	-	-	-
2026	-	\$ 112.48	-	\$ 12.84
2027	-	\$ 115.00	-	\$ 13.13
2028	-	\$ 117.55	-	\$ 13.38
2029	-	\$ 120.23	-	\$ 13.72
2030	-	\$ 122.91	-	\$ 14.03
2031	-	\$ 125.58	-	\$ 14.34
2032	-	\$ 128.28	-	\$ 14.60
2033	-	\$ 131.03	-	\$ 14.96
2034	-	\$ 133.79	-	\$ 15.27
2035	-	\$ 136.58	-	\$ 15.59
2036	-	\$ 139.44	-	\$ 15.87

Nominal Levelized Payment at 6.920% Discount Rate (2)

2020 - 2034	\$0.00	\$58.22	\$0.00	\$6.64
2021 - 2035	\$0.00	\$67.72	\$0.00	\$7.73
2022 - 2036	\$0.00	\$77.99	\$0.00	\$8.90

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

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing **2019.Q3 Avoided Cost Input Changes Quarterly Compliance Filing** in Docket No. 19-035-18 was served upon the following by email on January 10, 2020.

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