



1407 W. North Temple, Suite 330
Salt Lake City, Utah 84116

April 30, 2019

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. 19-035-18 – 2019.Q1 Avoided Cost Input Changes Quarterly Compliance Filing**

PacifiCorp, dba Rocky Mountain Power (the “Company”), 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.

No comments were filed challenging the Company’s previous compliance filing, which was submitted to the Commission on March 20, 2019.

Routine Updates

The Company identifies the following routine updates to its avoided cost inputs since the previous filing:

1. **GRID Model Data Updates**

A number of data and modeling assumption updates have occurred in the GRID model since the last filing. **Appendix A** provides a summary of those updates.

2. **Official Forward Price Curve (“OFPC”)**

Update to the curve dated March 29, 2019 (1903 OFPC).

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

Update of signed contract queue and current potential QFs. The QF queue was revised to include 2,612 megawatt (“MW”) nameplate in this filing. The potential queue was 3,470 MW nameplate in the 2018.Q4 filing.

Additional Details

Additional detail is provided below:

1. **GRID Data Updates** – A number of data and modeling assumption updates have occurred in GRID since the previous compliance filing. **Appendix A** provides a summary of those updates.
2. **PDDRR Avoided Cost Methodology** – The proxy resources used in the PDDRR avoided cost methodology are consistent with the Company’s 2017 Integrated Resource Plan (“IRP”) Update filed with the Commission on May 1, 2018. The 2017 IRP Update preferred portfolio includes cost-effective solar and wind resources. The incremental thermal QF resource partially displaces summer and winter front office transactions (“FOT”) since the 2017 IRP Update portfolio does not include any thermal resources. The incremental tracking solar QF resource partially displaces summer and winter FOTs during 2019–2032 and partially displaces the Utah South and Southern Oregon solar resources in 2033. The incremental wind QF resource partially displaces summer and winter FOTs during 2019–2032 and partially displaces the Dave Johnston wind resource in 2030.
3. **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. The updates reflect a total increase of approximately \$0.42/MWh.
 - 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 31.1 percent capacity factor single-axis tracking solar QF resource.
 - c. Avoided costs presented in **Appendix B.3** were calculated assuming an 80 MW 31 percent capacity factor wind QF resource.
4. **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

April 30, 2019

Page 3

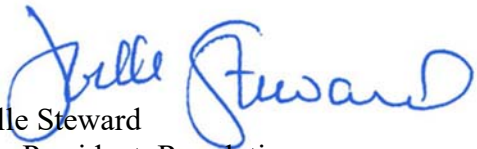
It is respectfully requested that all formal correspondence and requests regarding this compliance filing be addressed to:

By email (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. 18-035-23)

ROCKY MOUNTAIN POWER
DESCRIPTION OF AVOIDED COST INPUT CHANGES
2019.Q1 – April 2019

Appendix A

PacifiCorp Avoided Cost (Partial Displacement Differential Revenue Requirement (“PDDRR”)) Model Updates through April 2019 Docket No. 19-035-18 / Docket No. 03-035-14

Assumptions that have changed since the 2018.Q4 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 March 31, 2019 OFPC (1903 OFPC)**
- Hourly Market Price Scalars consistent with 2017 Integrated Resource Plan (“IRP”) Update

Fuel Prices (Coal)

- Average and incremental coal costs based on forecast dated August 2018.
- Coal burn expense reflects incremental coal costs and coal take or pay minimum burn levels.

IRP Resources

- 2017 IRP Update filed with the Public Service Commission of Utah (“UPSC”) on May 1, 2018.
- Resource additions, including generating resources, and front office transactions (“FOT”), consistent with 2017 IRP Update (Table 8.1).
- Existing plant retirement consistent with 2017 IRP Update (Table 8.1).
- The GRID topology includes the Aeolus to Bridger/Anticline portion of Gateway West (Energy Gateway sub-segment D2), consistent with the preferred portfolio in the 2017 IRP Update. The Energy Gateway assumptions are described in more detail in Chapter 7 of the 2017 IRP Update.
- Wind resources contained in the load and resource balance for the 2017 IRP Update preferred portfolio that were not approved by the Utah or Wyoming Commission have been replaced by Front Office Transactions through 2029 and proxy wind resources in comparable locations starting in 2030. The replacement resources are deferrable.
 - Everpower Wind qualified facility (“QF”) (Wyoming Northeast)
 - EV2020 Uinta Wind (Goshen)
 - Monticello Wind QF (Utah South)

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**.
- **2018** 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

- 6.91 percent discount rate - 2017 IRP Update
- Discount rate is consistent with the Commission's order in Docket 11-035-T06.

Inflation Rates

- Company's inflation rate forecast dated **March 2019**.

Levelized Prices (Nominal) at 6.91 percent Discount Rate

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

Load Forecast (Retail)

- 20-year load forecast dated October 19, 2018.

Long-Term Contracts

- Long-term contracts which have prices that are indexed to market are consistent with the **1903 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 **March 2019**.
- 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 **March 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 Flexible Reserve Study used in the 2017 IRP.
- Incremental integration costs for wind and solar resources reflect Flexible Reserve Study results used in the 2017 IRP.

Incremental Flex Capacity Costs (2016 \$/MWh)

	Regulation Reserve	System Balancing	Total
Wind	0.429	0.145	0.573
Solar	0.458	0.145	0.603

- Levelized integration costs for 2018-2032 for wind and solar are \$0.68/MWh and \$0.72/MWh, respectively.

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 2021.
- Typical week retail load reserve calculation thereafter.

STF Transactions

- Executed STF contracts as of **March 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 31.1 percent capacity factor and is located in the Utah North transmission bubble.
- The avoided cost wind resource is 80 MW with a 31.0 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
- Capacity contribution values used in this study reflect the values from the 2017 IRP, and are summarized below.

Renewable Type	Capacity Contribution - Percent of Nameplate	
	EAST	West
Wind	15.8%	11.8%
Solar – Fixed Mount	37.9%	53.9%
Solar –Tracking	59.7%	64.8%

Transmission

- Short-term transmission modeled based on 48 months ended **December 2018**.
- The GRID topology includes the Aeolus to Bridger/Anticline portion of Gateway West (Energy Gateway sub-segment D2), consistent with the preferred portfolio in the 2017 IRP. The Energy Gateway assumptions are described in more detail in Chapter 4 of the 2017 IRP. In Docket No. 17-035-37, the Commission specifically identified that the 2021 Aeolus Wind and Aeolus-Bridger Anticline Transmission (Gateway segment D2) in the 2017 IRP be considered deferrable by Utah Wind QFs until a final Commission determination was made. As a result of the Utah Commission’s June 22, 2018 order approving the EV2020 Wind resources and Energy Gateway sub-segment D2, this transmission is no longer considered deferrable.
- The loads and resources in the Wyoming Northeast transmission area have been reassigned to either the Wyoming East or Wyoming North transmission area and transmission limits between these areas are reflected in the GRID topology.

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.

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 2017 IRP Update.

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	-37.9	-240.0		15.8%	2019 11 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	0.0	13.3		0.0%	2018 02 01
22	Tesoro Non Firm QF	0.0	25.0		0.0%	2019 01 01
23	Kennecott Smelter Non Firm QF	0.0	31.8		0.0%	2019 01 01
24	Kennecott Refinery Non Firm QF	0.0	6.2		0.0%	2019 01 01
25	ExxonMobil QF	0.0	98.0		0.0%	2019 01 01
26	Tata Chemicals QF	0.0	30.0		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	COID Siphon QF	3.1	5.0		62.0%	2021 01 01
Total Signed MW		553.39	860.90			
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 - 281 - OR - Solar	25.9	40.0	24.5%	64.8%	2019 12 31
5	QF - 308 - WY - Wind	12.6	80.0	46.6%	15.8%	2020 11 01
6	QF - 309 - WY - Wind	12.6	80.0	46.6%	15.8%	2020 11 01
7	QF - 310 - WY - Wind	12.6	80.0	46.6%	15.8%	2020 11 01
8	QF - 311 - WY - Wind	6.3	40.0	46.6%	15.8%	2020 11 01
9	QF - 502 - WY - Solar	47.7	80.0	30.8%	59.7%	2020 12 01
10	QF - 451 - OR - Gas	0.0	2.4	100.1%	0.0%	2019 01 01
11	QF - 515 -WY Wind	2.6	16.5	29.5%	15.8%	2019 01 01
12	QF - 503 - WY - Solar	44.7	74.9	28.5%	59.7%	2022 01 01
13	QF - 504 - WY - Solar	29.8	50.0	29.9%	59.7%	2022 01 01
14	QF - 505 - WY - Solar	60.7	80.0	38.6%	75.8%	2022 02 01
15	QF - 508 - WY - Solar	36.3	50.0	31.7%	72.7%	2022 02 01
16	QF - 510 - WY - Solar	60.7	80.0	38.6%	75.8%	2022 02 01
17	QF - 511 - WY - Solar	60.7	80.0	38.6%	75.8%	2022 02 01
18	QF - 512 - WY - Solar	60.7	80.0	38.6%	75.8%	2022 02 01
19	QF - 513 - WY - Solar	34.6	58.0	28.2%	59.7%	2020 12 01
20	QF - 514 - WY - Gas	0.0	30.0	85.0%	0.0%	2020 01 01
21	QF - 515 - WY - Solar	47.7	80.0	27.9%	59.7%	2021 01 01
22	QF - 516 - WY - Wind	3.9	24.8	34.5%	15.8%	2019 08 01
23	QF - 517 - WY - Wind	0.3	1.8	34.5%	15.6%	2019 08 01
24	QF - 442 - WY - Solar	47.7	80.0	26.7%	59.7%	2022 05 01
25	QF - 507 - UT - Solar	60.7	80.0	38.6%	75.8%	2022 05 01
26	QF - 509 - UT - Solar	60.7	80.0	38.6%	75.8%	2022 05 01
27	QF - 506 - WY - Solar	60.7	80.0	38.6%	75.8%	2022 05 01
28	QF - 519 - WY - Solar	47.7	80.0	27.2%	59.7%	2022 06 01
29	QF - 520 - WY - Solar	47.7	80.0	27.2%	59.7%	2022 06 01
30	QF - 433 - UT - Gas	0.0	31.8	58.2%	0.0%	2020 01 01
31	QF - 434 - UT - Gas	0.0	6.2	85.0%	0.0%	2020 01 01
32	QF - 435 - UT - Gas	0.0	25.0	85.0%	0.0%	2020 01 01
Total Potential MW		950.55	1751.39			

Total Partial Displacement	1503.94	2612.29
----------------------------	----------------	----------------

** PacifiCorp's October 2018 load forecast includes incremental loads that are contingent upon the concurrent addition of renewable resources. To account for this, proxy renewable resources sufficient to meet the requirements embedded in the load forecast have been included in the queue of committed resources.*

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

- Thermal: No thermal resources are present in the 2017 IRP Update preferred portfolio. The incremental thermal QF displaces available FOTs for entire term.
- Tracking Solar: **1,636** MW of solar resources are displaced by the QF queue. After degradation, the incremental solar QF displaces **49 MW of Utah South solar resources and 24 MW of Southern Oregon solar resources in 2033. The Company retains 100% of the RECs starting in 2033.**
- Wind: **443 MW of wind resources are displaced by the QF queue. The incremental wind QF displaces 80 MW of Dave Johnston wind in 2030. The Company retains 100% of the RECs starting in 2030.**

Year	IRP Additions (Nameplate MW)				Base Case Displacement (Nameplate MW)				
	IRP Thermal	IRP Baseload Renewable	IRP Solar	IRP Wind	Thermal	Solar	Wind	FOT Summer	FOT Winter
2019	-	-	-	-	-	-	-	(201)	(201)
2020	-	-	-	-	-	-	-	(216)	(216)
2021	-	-	-	1,149	-	-	-	259	259
2022	-	-	-	1,149	-	-	-	445	305
2023	-	-	-	1,149	-	-	-	419	310
2024	-	-	-	1,149	-	-	-	428	304
2025	-	-	-	1,149	-	-	-	538	317
2026	-	-	-	1,149	-	-	-	499	330
2027	-	-	-	1,149	-	-	-	500	343
2028	-	-	-	1,149	-	-	-	1,009	357
2029	-	-	-	1,149	-	-	-	1,009	758
2030	-	-	651	1,750	-	651	443	615	615
2031	-	-	745	1,750	-	745	443	552	552
2032	-	-	878	1,750	-	878	443	467	467
2033	-	-	1,854	2,550	-	1,636	443	13	13
2034	-	-	1,854	2,550	-	1,636	443	13	13
2035	-	-	1,860	2,883	-	1,636	443	13	13
2036	-	-	1,860	3,032	-	1,636	443	13	13

IRP Partial Displacements (Previous Filing)

Total partial displacement was 1,999.81 MW in the base case and 2,099.81 MW in the avoided cost case as shown in the table below, adjusted for solar degradation:

Contracts Queue						
No.	QF	Partial Displacement	Nameplate	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	-37.9	-240.0		15.8%	2019 11 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	0.0	13.3		0.0%	2018 02 01
22	Tesoro Non Firm QF	0.0	25.0		0.0%	2019 01 01
23	Kennecott Smelter Non Firm QF	0.0	31.8		0.0%	2019 01 01
24	Kennecott Refinery Non Firm QF	0.0	6.2		0.0%	2019 01 01
25	ExxonMobil QF	0.0	98.0		0.0%	2019 01 01
26	Tata Chemicals QF	0.0	30.0		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	COID Siphon QF	3.1	5.0		62.0%	2021 01 01
Total Signed MW		553.39	860.90			
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 - 281 - OR - Solar	25.9	40.0	24.5%	64.8%	2019 12 31
5	QF - 459 - WY - Solar	47.7	80.0	24.8%	59.7%	2020 01 01
6	QF - 308 - WY - Wind	12.6	80.0	46.6%	15.8%	2020 11 01
7	QF - 309 - WY - Wind	12.6	80.0	46.6%	15.8%	2020 11 01

8	QF - 310 - WY - Wind	12.6	80.0	46.6%	15.8%	2020 11 01
9	QF - 311 - WY - Wind	6.3	40.0	46.6%	15.8%	2020 11 01
10	QF - 406 - OR - Solar	51.8	80.0	27.1%	64.8%	2021 12 01
11	QF - 407 - OR - Solar	51.8	80.0	27.1%	64.8%	2021 12 01
12	QF - 408 - OR - Solar	51.8	80.0	26.7%	64.8%	2021 12 01
13	QF - 409 - OR - Solar	51.8	80.0	26.7%	64.8%	2021 12 01
14	QF - 410 - OR - Solar	51.8	80.0	26.7%	64.8%	2021 12 01
15	QF - 486 - OR - Solar	51.8	80.0	26.7%	64.8%	2021 12 01
16	QF - 487 - OR - Solar	51.8	80.0	26.7%	64.8%	2021 12 01
17	QF - 488 - OR - Solar	51.8	80.0	26.7%	64.8%	2021 12 01
18	QF - 328 - OR - Solar	29.8	46.0	28.7%	64.8%	2020 01 01
19	QF - 440 - OR - Solar	32.4	50.0	28.9%	64.8%	2019 06 01
20	QF - 411 - OR - Solar	32.4	50.0	27.5%	64.8%	2021 12 01
21	QF - 428 - WY - Solar	23.9	40.0	30.2%	59.7%	2021 08 01
22	QF - 429 - WY - Solar	23.9	40.0	30.2%	59.7%	2021 08 01
23	QF - 442 - WY - Solar	47.7	80.0	26.7%	59.7%	2022 01 01
24	QF - 497 - WY - Wind	12.6	80.0	36.8%	15.8%	2020 12 01
25	QF - 498 - WY - Wind	12.6	80.0	36.8%	15.8%	2020 12 01
26	QF - 499 - WY - Wind	12.6	80.0	36.8%	15.8%	2020 12 01
27	QF - 404 - ID - Solar	0.6	0.9	24.5%	59.8%	2019 04 01
28	QF - 502 - WY - Solar	47.7	80.0	30.8%	59.7%	2020 12 01
29	QF - 451 - OR - Gas	0.0	2.4	100.1%	0.0%	2019 01 01
30	QF - 515 -WY Wind	2.6	16.5	29.5%	15.8%	2019 01 01
31	QF - 503 - WY - Solar	44.7	74.9	28.5%	59.7%	2022 01 01
32	QF - 504 - WY - Solar	29.8	50.0	29.9%	59.7%	2022 01 01
33	QF - 505 - WY - Solar	60.7	80.0	38.6%	75.8%	2022 02 01
34	QF - 506 - WY - Solar	60.7	80.0	38.6%	75.8%	2022 02 01
35	QF - 509 - UT - Solar	60.7	80.0	38.6%	75.8%	2022 02 01
36	QF - 508 - WY - Solar	36.3	50.0	31.7%	72.7%	2022 02 01
37	QF - 510 - WY - Solar	60.7	80.0	38.6%	75.8%	2022 02 01
38	QF - 511 - WY - Solar	60.7	80.0	38.6%	75.8%	2022 02 01
39	QF - 512 - WY - Solar	60.7	80.0	38.6%	75.8%	2022 02 01
40	QF - 507 - UT - Solar	60.7	80.0	38.6%	75.8%	2022 02 01
41	QF - 513 - WY - Solar	34.6	58.0	28.2%	59.7%	2020 12 01
42	QF - 514 - WY - Gas	0.0	30.0	85.0%	0.0%	2020 01 01
Total Potential MW		1446.42	2608.76			
Total Partial Displacement		1999.81	3469.66			

ROCKY MOUNTAIN POWER

UPDATE IMPACT – UPDATED AVOIDED COST STUDY

2019.Q1 – April 2019

Appendix B.1

**Avoided Cost Prices \$/MWh
Utah 2019.Q1 Sch 38**

Year	Thermal Avoided Cost at 85.0% CF (2)	Solar Tracking Avoided Cost at 31.1% CF (2)	Wind Avoided Cost at 31.0% CF (2)	Thermal UT 2018.Q4 Filing	Solar Tracking UT 2018.Q4 Filing	Wind UT 2018.Q4 Filing	Thermal Difference	Solar Tracking Difference	Wind Difference
2020	\$21.07	\$19.95	\$18.62	\$20.33	\$20.06	\$17.01	\$0.75	(\$0.12)	\$1.61
2021	\$17.47	\$13.99	\$16.89	\$15.26	\$12.09	\$14.12	\$2.21	\$1.90	\$2.77
2022	\$17.99	\$13.75	\$15.08	\$16.16	\$12.38	\$13.53	\$1.83	\$1.37	\$1.55
2023	\$17.84	\$14.19	\$15.47	\$20.62	\$14.78	\$20.10	(\$2.77)	(\$0.60)	(\$4.63)
2024	\$23.57	\$18.33	\$22.37	\$23.45	\$17.04	\$21.67	\$0.11	\$1.29	\$0.70
2025	\$24.45	\$19.35	\$22.85	\$25.19	\$17.96	\$23.13	(\$0.74)	\$1.39	(\$0.28)
2026	\$25.88	\$20.87	\$23.83	\$25.31	\$17.37	\$23.22	\$0.57	\$3.50	\$0.62
2027	\$26.50	\$19.54	\$24.99	\$25.99	\$17.74	\$23.30	\$0.51	\$1.81	\$1.68
2028	\$30.32	\$23.32	\$28.43	\$28.01	\$20.38	\$24.30	\$2.32	\$2.94	\$4.13
2029	\$35.12	\$26.70	\$33.16	\$32.47	\$23.65	\$31.82	\$2.64	\$3.05	\$1.34
2030	\$39.43	\$30.72	\$58.05	\$40.23	\$29.17	\$39.41	(\$0.80)	\$1.56	\$18.63
2031	\$42.21	\$32.98	\$57.23	\$42.65	\$31.55	\$41.07	(\$0.43)	\$1.43	\$16.16
2032	\$43.93	\$34.26	\$57.80	\$45.43	\$32.91	\$44.71	(\$1.50)	\$1.34	\$13.10
2033	\$50.00	\$43.64	\$60.12	\$49.79	\$34.85	\$50.95	\$0.21	\$8.80	\$9.17
2034	\$52.36	\$44.88	\$61.73	\$52.30	\$38.03	\$51.81	\$0.06	\$6.86	\$9.92

15-Year Levelized Prices (Nominal) @ 6.910% Discount Rate (1) (3)

2020-2034	\$/MWh	\$28.13	\$22.46	\$29.89	\$27.74	\$20.47	\$26.05	\$0.39	\$1.99	\$3.84
								1%	10%	15%

Footnotes:

- (1) Discount Rate - 2017 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.Q1 - 100.0 MW and 100.0% CF

Year	Capacity Price \$/kW-yr	Energy Only Price \$/MWh ⁽²⁾	Total Price @ 100.0% Capacity Factor \$/MWh
2019	\$0.00	\$27.21	\$27.21
2020	\$0.00	\$21.07	\$21.07
2021	\$0.00	\$17.47	\$17.47
2022	\$0.00	\$17.99	\$17.99
2023	\$0.00	\$17.84	\$17.84
2024	\$0.00	\$23.57	\$23.57
2025	\$0.00	\$24.45	\$24.45
2026	\$0.00	\$25.88	\$25.88
2027	\$0.00	\$26.50	\$26.50
2028	\$0.00	\$30.32	\$30.32
2029	\$0.00	\$35.12	\$35.12
2030	\$0.00	\$39.43	\$39.43
2031	\$0.00	\$42.21	\$42.21
2032	\$0.00	\$43.93	\$43.93
2033	\$0.00	\$50.00	\$50.00
2034	\$0.00	\$52.36	\$52.36
2035	\$0.00	\$56.51	\$56.51
2036	\$0.00	\$58.32	\$58.32
2037	\$0.00	\$59.65	\$59.65
2038	\$0.00	\$61.02	\$61.02

15 Year Starting 2019

15 year Levelized Prices (Nominal) @ 6.91% Discount Rate (1)

\$/kW	\$0.00		
\$/MWh		\$27.14	\$27.14

15 Year Starting 2020

15 year Levelized Prices (Nominal) @ 6.91% Discount Rate (1)

\$/kW	\$0.00	\$28.13	\$28.13
\$/MWh			

Footnotes:

- (1) Discount Rate - 2017 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.Q1 - 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													
2019	27.21	22.80	47.43	22.19	18.95	16.20	17.58	56.11	44.55	23.03	16.78	17.78	24.13
2020	21.07	18.22	19.71	17.50	16.46	15.43	16.58	47.22	30.64	21.58	16.12	16.33	16.54
2021	17.47	17.19	16.83	14.04	14.26	14.31	13.26	27.34	23.86	18.09	14.56	16.94	18.65
2022	17.99	17.47	19.15	15.08	13.86	16.15	14.96	24.28	22.84	16.15	16.35	17.63	21.81
2023	17.84	18.84	15.29	14.99	14.57	14.89	15.25	26.55	22.86	16.99	15.43	16.93	21.03
2024	23.57	23.08	21.57	19.08	18.46	16.83	22.33	33.25	33.32	22.52	22.55	22.67	26.71
2025	24.45	22.06	22.07	20.70	19.51	17.93	20.32	38.58	35.16	24.08	23.39	23.85	25.16
2026	25.88	21.35	23.34	22.44	20.91	18.56	22.50	39.81	40.77	24.22	24.24	25.54	26.32
2027	26.50	24.43	22.95	22.98	20.99	18.65	24.62	39.85	39.66	25.47	24.56	26.12	27.13
2028	30.32	25.39	26.06	26.29	25.34	21.59	26.03	52.90	48.51	27.82	26.25	26.69	30.23
2029	35.12	29.89	30.36	29.38	25.12	23.48	28.31	61.02	66.08	33.12	29.20	29.45	34.73
2030	39.43	33.89	31.59	28.77	26.37	24.29	33.12	78.05	74.75	36.74	31.19	33.52	39.17
2031	42.21	36.52	34.64	31.25	29.94	26.12	35.85	83.70	79.50	39.72	32.65	34.92	40.08
2032	43.93	37.26	35.37	33.73	30.56	27.29	40.01	86.89	80.41	41.36	34.16	36.34	42.38
2033	50.00	40.66	39.02	33.40	34.25	28.99	46.02	111.89	93.66	46.03	38.35	40.34	45.30
2034	52.36	41.49	42.51	36.31	36.70	29.34	48.62	115.73	100.10	47.43	38.95	42.30	46.80
2035	56.51	43.73	42.56	39.13	37.38	31.51	47.77	120.72	125.79	51.00	41.42	41.98	52.25
2036	58.32	44.05	44.25	39.66	37.39	31.18	50.98	133.38	115.82	55.78	45.46	44.05	55.53

Table 4
Burnertip Natural Gas Price Forecast
Utah 2019.Q1 - 100.0 MW and 100.0% CF

Year	PacifiCorp		
	Delivered IRP - Utah Greenfield Fuel Cost	Delivered IRP West Side Fuel Cost	Delivered IRP - Wyo NE Fuel Cost
2016	\$2.32	\$2.30	\$2.35
2017	\$2.65	\$3.31	\$2.66
2018	\$2.59	\$3.23	\$2.60
2019	\$2.75	\$4.37	\$2.43
2020	\$2.37	\$2.33	\$2.17
2021	\$2.25	\$2.14	\$2.13
2022	\$2.36	\$2.28	\$2.24
2023	\$2.53	\$2.49	\$2.41
2024	\$2.82	\$2.84	\$2.70
2025	\$3.19	\$3.18	\$3.06
2026	\$3.42	\$3.44	\$3.29
2027	\$3.56	\$3.60	\$3.44
2028	\$3.80	\$3.86	\$3.67
2029	\$3.94	\$4.02	\$3.81
2030	\$4.10	\$4.16	\$3.96
2031	\$4.40	\$4.45	\$4.27
2032	\$4.65	\$4.68	\$4.51
2033	\$5.04	\$5.03	\$4.89
2034	\$5.19	\$5.17	\$5.05
2035	\$5.35	\$5.27	\$5.20
2036	\$5.47	\$5.35	\$5.32
2037	\$5.87	\$5.76	\$5.72
2038	\$6.15	\$6.01	\$6.00
2039	\$6.40	\$6.25	\$6.25
2040	\$6.63	\$6.49	\$6.47
2041	\$6.86	\$6.75	\$6.70
2042	\$4.89	\$4.80	\$4.78

Official Forward Price Curve Forecast dated Mar 29, 2019

Table 5

**Utah 2019.Q1 - 100.0 MW and 100.0% CF
January 2019 through December 2038
Nominal Avoided Costs Calculated Monthly**

Nominal NPV at 6.91% Discount Rate

15 Year Starting 2019 \$ 224,712,972 \$ - \$ 224,712,972 \$ 8,280,163 \$27.14
15 Year Starting 2020 \$ 232,960,243 \$ - \$ 232,960,243 \$ 8,280,592 \$28.13

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	100.0% CF	Dollars	MWH	100.0% CF
Jan-19	1,696,003	-	1,696,003	74,400	22.80
Feb-19	3,187,049	-	3,187,049	67,200	47.43
Mar-19	1,650,598	-	1,650,598	74,400	22.19
Apr-19	1,364,675	-	1,364,675	72,000	18.95
May-19	1,205,049	-	1,205,049	74,400	16.20
Jun-19	1,265,891	-	1,265,891	72,000	17.58
Jul-19	4,174,338	-	4,174,338	74,400	56.11
Aug-19	3,314,202	-	3,314,202	74,400	44.55
Sep-19	1,658,467	-	1,658,467	72,000	23.03
Oct-19	1,248,455	-	1,248,455	74,400	16.78
Nov-19	1,280,124	-	1,280,124	72,000	17.78
Dec-19	1,795,081	-	1,795,081	74,400	24.13
Jan-20	1,355,850	-	1,355,850	74,400	18.22
Feb-20	1,371,948	-	1,371,948	69,600	19.71
Mar-20	1,301,829	-	1,301,829	74,400	17.50
Apr-20	1,185,396	-	1,185,396	72,000	16.46
May-20	1,148,035	-	1,148,035	74,400	15.43
Jun-20	1,193,671	-	1,193,671	72,000	16.58
Jul-20	3,513,458	-	3,513,458	74,400	47.22
Aug-20	2,279,530	-	2,279,530	74,400	30.64
Sep-20	1,553,477	-	1,553,477	72,000	21.58
Oct-20	1,199,464	-	1,199,464	74,400	16.12
Nov-20	1,175,778	-	1,175,778	72,000	16.33
Dec-20	1,230,947	-	1,230,947	74,400	16.54
Jan-21	1,278,604	-	1,278,604	74,400	17.19
Feb-21	1,130,871	-	1,130,871	67,200	16.83
Mar-21	1,044,632	-	1,044,632	74,400	14.04
Apr-21	1,026,680	-	1,026,680	72,000	14.26
May-21	1,064,853	-	1,064,853	74,400	14.31
Jun-21	954,770	-	954,770	72,000	13.26
Jul-21	2,034,129	-	2,034,129	74,400	27.34
Aug-21	1,775,267	-	1,775,267	74,400	23.86
Sep-21	1,302,613	-	1,302,613	72,000	18.09
Oct-21	1,083,337	-	1,083,337	74,400	14.56
Nov-21	1,219,368	-	1,219,368	72,000	16.94
Dec-21	1,387,199	-	1,387,199	74,400	18.65
Jan-22	1,299,741	-	1,299,741	74,400	17.47
Feb-22	1,286,938	-	1,286,938	67,200	19.15
Mar-22	1,122,238	-	1,122,238	74,400	15.08
Apr-22	997,641	-	997,641	72,000	13.86
May-22	1,201,190	-	1,201,190	74,400	16.15
Jun-22	1,077,368	-	1,077,368	72,000	14.96
Jul-22	1,806,589	-	1,806,589	74,400	24.28
Aug-22	1,699,240	-	1,699,240	74,400	22.84
Sep-22	1,162,485	-	1,162,485	72,000	16.15
Oct-22	1,216,791	-	1,216,791	74,400	16.35
Nov-22	1,269,110	-	1,269,110	72,000	17.63
Dec-22	1,622,829	-	1,622,829	74,400	21.81

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	100.0% CF	Dollars	MWH	100.0% CF
Jan-23	1,401,809	-	1,401,809	74,400	18.84
Feb-23	1,027,789	-	1,027,789	67,200	15.29
Mar-23	1,115,161	-	1,115,161	74,400	14.99
Apr-23	1,048,905	-	1,048,905	72,000	14.57
May-23	1,107,624	-	1,107,624	74,400	14.89
Jun-23	1,097,963	-	1,097,963	72,000	15.25
Jul-23	1,975,274	-	1,975,274	74,400	26.55
Aug-23	1,700,915	-	1,700,915	74,400	22.86
Sep-23	1,223,531	-	1,223,531	72,000	16.99
Oct-23	1,147,824	-	1,147,824	74,400	15.43
Nov-23	1,218,849	-	1,218,849	72,000	16.93
Dec-23	1,564,626	-	1,564,626	74,400	21.03
Jan-24	1,717,015	-	1,717,015	74,400	23.08
Feb-24	1,500,942	-	1,500,942	69,600	21.57
Mar-24	1,419,920	-	1,419,920	74,400	19.08
Apr-24	1,329,468	-	1,329,468	72,000	18.46
May-24	1,252,470	-	1,252,470	74,400	16.83
Jun-24	1,607,893	-	1,607,893	72,000	22.33
Jul-24	2,473,556	-	2,473,556	74,400	33.25
Aug-24	2,479,348	-	2,479,348	74,400	33.32
Sep-24	1,621,449	-	1,621,449	72,000	22.52
Oct-24	1,677,888	-	1,677,888	74,400	22.55
Nov-24	1,632,202	-	1,632,202	72,000	22.67
Dec-24	1,987,406	-	1,987,406	74,400	26.71
Jan-25	1,641,159	-	1,641,159	74,400	22.06
Feb-25	1,483,176	-	1,483,176	67,200	22.07
Mar-25	1,540,043	-	1,540,043	74,400	20.70
Apr-25	1,404,894	-	1,404,894	72,000	19.51
May-25	1,334,217	-	1,334,217	74,400	17.93
Jun-25	1,462,992	-	1,462,992	72,000	20.32
Jul-25	2,870,401	-	2,870,401	74,400	38.58
Aug-25	2,616,185	-	2,616,185	74,400	35.16
Sep-25	1,733,482	-	1,733,482	72,000	24.08
Oct-25	1,740,487	-	1,740,487	74,400	23.39
Nov-25	1,717,223	-	1,717,223	72,000	23.85
Dec-25	1,871,897	-	1,871,897	74,400	25.16
Jan-26	1,588,505	-	1,588,505	74,400	21.35
Feb-26	1,568,293	-	1,568,293	67,200	23.34
Mar-26	1,669,838	-	1,669,838	74,400	22.44
Apr-26	1,505,420	-	1,505,420	72,000	20.91
May-26	1,380,812	-	1,380,812	74,400	18.56
Jun-26	1,619,828	-	1,619,828	72,000	22.50
Jul-26	2,962,024	-	2,962,024	74,400	39.81
Aug-26	3,032,959	-	3,032,959	74,400	40.77
Sep-26	1,743,969	-	1,743,969	72,000	24.22
Oct-26	1,803,178	-	1,803,178	74,400	24.24
Nov-26	1,838,591	-	1,838,591	72,000	25.54
Dec-26	1,958,393	-	1,958,393	74,400	26.32
Jan-27	1,817,918	-	1,817,918	74,400	24.43
Feb-27	1,542,266	-	1,542,266	67,200	22.95
Mar-27	1,709,963	-	1,709,963	74,400	22.98
Apr-27	1,510,978	-	1,510,978	72,000	20.99
May-27	1,387,377	-	1,387,377	74,400	18.65
Jun-27	1,772,969	-	1,772,969	72,000	24.62
Jul-27	2,965,109	-	2,965,109	74,400	39.85
Aug-27	2,950,395	-	2,950,395	74,400	39.66
Sep-27	1,833,606	-	1,833,606	72,000	25.47
Oct-27	1,827,482	-	1,827,482	74,400	24.56
Nov-27	1,880,286	-	1,880,286	72,000	26.12
Dec-27	2,018,419	-	2,018,419	74,400	27.13

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	100.0% CF	Dollars	MWH	100.0% CF
Jan-28	1,889,185	-	1,889,185	74,400	25.39
Feb-28	1,813,899	-	1,813,899	69,600	26.06
Mar-28	1,955,693	-	1,955,693	74,400	26.29
Apr-28	1,824,698	-	1,824,698	72,000	25.34
May-28	1,606,276	-	1,606,276	74,400	21.59
Jun-28	1,874,291	-	1,874,291	72,000	26.03
Jul-28	3,935,648	-	3,935,648	74,400	52.90
Aug-28	3,609,496	-	3,609,496	74,400	48.51
Sep-28	2,003,157	-	2,003,157	72,000	27.82
Oct-28	1,952,929	-	1,952,929	74,400	26.25
Nov-28	1,921,518	-	1,921,518	72,000	26.69
Dec-28	2,248,814	-	2,248,814	74,400	30.23
Jan-29	2,223,536	-	2,223,536	74,400	29.89
Feb-29	2,040,494	-	2,040,494	67,200	30.36
Mar-29	2,185,870	-	2,185,870	74,400	29.38
Apr-29	1,808,954	-	1,808,954	72,000	25.12
May-29	1,746,644	-	1,746,644	74,400	23.48
Jun-29	2,038,545	-	2,038,545	72,000	28.31
Jul-29	4,539,639	-	4,539,639	74,400	61.02
Aug-29	4,916,209	-	4,916,209	74,400	66.08
Sep-29	2,384,772	-	2,384,772	72,000	33.12
Oct-29	2,172,598	-	2,172,598	74,400	29.20
Nov-29	2,120,730	-	2,120,730	72,000	29.45
Dec-29	2,583,714	-	2,583,714	74,400	34.73
Jan-30	2,521,227	-	2,521,227	74,400	33.89
Feb-30	2,122,693	-	2,122,693	67,200	31.59
Mar-30	2,140,325	-	2,140,325	74,400	28.77
Apr-30	1,898,432	-	1,898,432	72,000	26.37
May-30	1,807,265	-	1,807,265	74,400	24.29
Jun-30	2,384,685	-	2,384,685	72,000	33.12
Jul-30	5,806,931	-	5,806,931	74,400	78.05
Aug-30	5,561,460	-	5,561,460	74,400	74.75
Sep-30	2,645,622	-	2,645,622	72,000	36.74
Oct-30	2,320,481	-	2,320,481	74,400	31.19
Nov-30	2,413,180	-	2,413,180	72,000	33.52
Dec-30	2,914,223	-	2,914,223	74,400	39.17
Jan-31	2,717,298	-	2,717,298	74,400	36.52
Feb-31	2,327,709	-	2,327,709	67,200	34.64
Mar-31	2,324,729	-	2,324,729	74,400	31.25
Apr-31	2,155,894	-	2,155,894	72,000	29.94
May-31	1,943,628	-	1,943,628	74,400	26.12
Jun-31	2,581,165	-	2,581,165	72,000	35.85
Jul-31	6,227,261	-	6,227,261	74,400	83.70
Aug-31	5,914,682	-	5,914,682	74,400	79.50
Sep-31	2,859,725	-	2,859,725	72,000	39.72
Oct-31	2,429,439	-	2,429,439	74,400	32.65
Nov-31	2,514,487	-	2,514,487	72,000	34.92
Dec-31	2,981,785	-	2,981,785	74,400	40.08
Jan-32	2,771,869	-	2,771,869	74,400	37.26
Feb-32	2,461,899	-	2,461,899	69,600	35.37
Mar-32	2,509,361	-	2,509,361	74,400	33.73
Apr-32	2,200,378	-	2,200,378	72,000	30.56
May-32	2,030,040	-	2,030,040	74,400	27.29
Jun-32	2,880,984	-	2,880,984	72,000	40.01
Jul-32	6,464,866	-	6,464,866	74,400	86.89
Aug-32	5,982,359	-	5,982,359	74,400	80.41
Sep-32	2,978,127	-	2,978,127	72,000	41.36
Oct-32	2,541,389	-	2,541,389	74,400	34.16
Nov-32	2,616,533	-	2,616,533	72,000	36.34
Dec-32	3,153,035	-	3,153,035	74,400	42.38

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	100.0% CF	Dollars	MWH	100.0% CF
Jan-33	3,024,739	-	3,024,739	74,400	40.66
Feb-33	2,622,082	-	2,622,082	67,200	39.02
Mar-33	2,485,154	-	2,485,154	74,400	33.40
Apr-33	2,466,162	-	2,466,162	72,000	34.25
May-33	2,157,100	-	2,157,100	74,400	28.99
Jun-33	3,313,349	-	3,313,349	72,000	46.02
Jul-33	8,324,500	-	8,324,500	74,400	111.89
Aug-33	6,968,201	-	6,968,201	74,400	93.66
Sep-33	3,314,462	-	3,314,462	72,000	46.03
Oct-33	2,853,126	-	2,853,126	74,400	38.35
Nov-33	2,904,563	-	2,904,563	72,000	40.34
Dec-33	3,370,141	-	3,370,141	74,400	45.30
Jan-34	3,087,127	-	3,087,127	74,400	41.49
Feb-34	2,856,716	-	2,856,716	67,200	42.51
Mar-34	2,701,773	-	2,701,773	74,400	36.31
Apr-34	2,642,293	-	2,642,293	72,000	36.70
May-34	2,182,675	-	2,182,675	74,400	29.34
Jun-34	3,500,843	-	3,500,843	72,000	48.62
Jul-34	8,610,158	-	8,610,158	74,400	115.73
Aug-34	7,447,659	-	7,447,659	74,400	100.10
Sep-34	3,414,652	-	3,414,652	72,000	47.43
Oct-34	2,897,759	-	2,897,759	74,400	38.95
Nov-34	3,045,498	-	3,045,498	72,000	42.30
Dec-34	3,482,076	-	3,482,076	74,400	46.80
Jan-35	3,253,586	-	3,253,586	74,400	43.73
Feb-35	2,859,963	-	2,859,963	67,200	42.56
Mar-35	2,911,460	-	2,911,460	74,400	39.13
Apr-35	2,691,686	-	2,691,686	72,000	37.38
May-35	2,344,276	-	2,344,276	74,400	31.51
Jun-35	3,439,634	-	3,439,634	72,000	47.77
Jul-35	8,981,640	-	8,981,640	74,400	120.72
Aug-35	9,358,755	-	9,358,755	74,400	125.79
Sep-35	3,671,659	-	3,671,659	72,000	51.00
Oct-35	3,081,615	-	3,081,615	74,400	41.42
Nov-35	3,022,701	-	3,022,701	72,000	41.98
Dec-35	3,887,498	-	3,887,498	74,400	52.25
Jan-36	3,277,381	-	3,277,381	74,400	44.05
Feb-36	3,079,606	-	3,079,606	69,600	44.25
Mar-36	2,950,872	-	2,950,872	74,400	39.66
Apr-36	2,691,861	-	2,691,861	72,000	37.39
May-36	2,319,669	-	2,319,669	74,400	31.18
Jun-36	3,670,641	-	3,670,641	72,000	50.98
Jul-36	9,923,481	-	9,923,481	74,400	133.38
Aug-36	8,616,963	-	8,616,963	74,400	115.82
Sep-36	4,016,449	-	4,016,449	72,000	55.78
Oct-36	3,381,973	-	3,381,973	74,400	45.46
Nov-36	3,171,293	-	3,171,293	72,000	44.05
Dec-36	4,131,425	-	4,131,425	74,400	55.53
Jan-37	3,349,484	-	3,349,484	74,400	45.02
Feb-37	3,038,828	-	3,038,828	67,200	45.22
Mar-37	3,015,791	-	3,015,791	74,400	40.53
Apr-37	2,751,082	-	2,751,082	72,000	38.21
May-37	2,370,702	-	2,370,702	74,400	31.86
Jun-37	3,751,395	-	3,751,395	72,000	52.10
Jul-37	10,141,798	-	10,141,798	74,400	136.31
Aug-37	8,806,537	-	8,806,537	74,400	118.37
Sep-37	4,104,810	-	4,104,810	72,000	57.01
Oct-37	3,456,376	-	3,456,376	74,400	46.46
Nov-37	3,241,062	-	3,241,062	72,000	45.01
Dec-37	4,222,316	-	4,222,316	74,400	56.75

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	100.0% CF	Dollars	MWH	100.0% CF
Jan-38	3,426,522	-	3,426,522	74,400	46.06
Feb-38	3,108,721	-	3,108,721	67,200	46.26
Mar-38	3,085,154	-	3,085,154	74,400	41.47
Apr-38	2,814,357	-	2,814,357	72,000	39.09
May-38	2,425,228	-	2,425,228	74,400	32.60
Jun-38	3,837,677	-	3,837,677	72,000	53.30
Jul-38	10,375,059	-	10,375,059	74,400	139.45
Aug-38	9,009,087	-	9,009,087	74,400	121.09
Sep-38	4,199,221	-	4,199,221	72,000	58.32
Oct-38	3,535,873	-	3,535,873	74,400	47.53
Nov-38	3,315,606	-	3,315,606	72,000	46.05
Dec-38	4,319,429	-	4,319,429	74,400	58.06

Appendix B.1

**Avoided Cost Prices \$/MWh
Utah 2019.Q1 Sch 38**

Year	Thermal Avoided Cost at 85.0% CF (2)	Solar Tracking Avoided Cost at 31.1% CF (2)	Wind Avoided Cost at 31.0% CF (2)	Thermal UT 2018.Q4 Filing	Solar Tracking UT 2018.Q4 Filing	Wind UT 2018.Q4 Filing	Thermal Difference	Solar Tracking Difference	Wind Difference
2020	\$21.07	\$19.95	\$18.62	\$20.33	\$20.06	\$17.01	\$0.75	(\$0.12)	\$1.61
2021	\$17.47	\$13.99	\$16.89	\$15.26	\$12.09	\$14.12	\$2.21	\$1.90	\$2.77
2022	\$17.99	\$13.75	\$15.08	\$16.16	\$12.38	\$13.53	\$1.83	\$1.37	\$1.55
2023	\$17.84	\$14.19	\$15.47	\$20.62	\$14.78	\$20.10	(\$2.77)	(\$0.60)	(\$4.63)
2024	\$23.57	\$18.33	\$22.37	\$23.45	\$17.04	\$21.67	\$0.11	\$1.29	\$0.70
2025	\$24.45	\$19.35	\$22.85	\$25.19	\$17.96	\$23.13	(\$0.74)	\$1.39	(\$0.28)
2026	\$25.88	\$20.87	\$23.83	\$25.31	\$17.37	\$23.22	\$0.57	\$3.50	\$0.62
2027	\$26.50	\$19.54	\$24.99	\$25.99	\$17.74	\$23.30	\$0.51	\$1.81	\$1.68
2028	\$30.32	\$23.32	\$28.43	\$28.01	\$20.38	\$24.30	\$2.32	\$2.94	\$4.13
2029	\$35.12	\$26.70	\$33.16	\$32.47	\$23.65	\$31.82	\$2.64	\$3.05	\$1.34
2030	\$39.43	\$30.72	\$58.05	\$40.23	\$29.17	\$39.41	(\$0.80)	\$1.56	\$18.63
2031	\$42.21	\$32.98	\$57.23	\$42.65	\$31.55	\$41.07	(\$0.43)	\$1.43	\$16.16
2032	\$43.93	\$34.26	\$57.80	\$45.43	\$32.91	\$44.71	(\$1.50)	\$1.34	\$13.10
2033	\$50.00	\$43.64	\$60.12	\$49.79	\$34.85	\$50.95	\$0.21	\$8.80	\$9.17
2034	\$52.36	\$44.88	\$61.73	\$52.30	\$38.03	\$51.81	\$0.06	\$6.86	\$9.92

15-Year Levelized Prices (Nominal) @ 6.910% Discount Rate (1) (3)

2020-2034	\$/MWh	\$28.13	\$22.46	\$29.89	\$27.74	\$20.47	\$26.05	\$0.39	\$1.99	\$3.84
								1%	10%	15%

Footnotes:

- (1) Discount Rate - 2017 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.Q1_Solar - 80.0 MW and 31.0% CF

Year	Capacity Price \$/kW-yr	Energy Only Price \$/MWh ⁽²⁾	Total Price @ 31.0% Capacity Factor \$/MWh
2019	\$0.00	\$26.41	\$26.41
2020	\$0.00	\$19.95	\$19.95
2021	\$0.00	\$13.99	\$13.99
2022	\$0.00	\$13.75	\$13.75
2023	\$0.00	\$14.19	\$14.19
2024	\$0.00	\$18.33	\$18.33
2025	\$0.00	\$19.35	\$19.35
2026	\$0.00	\$20.87	\$20.87
2027	\$0.00	\$19.54	\$19.54
2028	\$0.00	\$23.32	\$23.32
2029	\$0.00	\$26.70	\$26.70
2030	\$0.00	\$30.72	\$30.72
2031	\$0.00	\$32.98	\$32.98
2032	\$0.00	\$34.26	\$34.26
2033	\$108.05	\$1.02	\$43.64
2034	\$110.54	\$1.06	\$44.88
2035	\$112.97	\$1.07	\$46.09
2036	\$115.46	\$1.08	\$47.17
2037	\$118.00	\$1.10	\$48.30
2038	\$120.71	\$1.13	\$49.41

15 Year Starting 2019

15 year Levelized Prices (Nominal) @ 6.91% Discount Rate (1)

\$/kW	\$4.45		
\$/MWh		\$20.43	\$22.07

15 Year Starting 2020

15 year Levelized Prices (Nominal) @ 6.91% Discount Rate (1)

\$/kW	\$9.36	\$19.01	\$22.46
\$/MWh			

Footnotes:

(1) Discount Rate - 2017 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.Q1_Solar - 80.0 MW and 31.0% CF

Year	Annual	Winter Season					Summer Season				Winter Season		
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Energy Only													
2019	26.41	19.30	39.59	18.44	14.83	14.63	16.98	64.56	43.43	21.86	15.06	15.27	21.26
2020	19.95	16.46	15.80	14.02	12.90	13.07	15.91	51.82	27.86	19.13	14.18	5.61	15.19
2021	13.99	12.27	12.24	9.08	9.69	11.39	11.35	23.26	19.52	13.72	11.33	16.76	16.46
2022	13.75	14.52	12.57	12.02	9.51	12.89	12.09	18.66	18.96	11.53	13.27	12.74	15.90
2023	14.19	12.91	12.49	11.30	10.71	11.57	13.32	22.48	16.87	14.46	12.83	13.26	15.91
2024	18.33	17.72	16.17	12.67	11.94	12.66	18.29	29.26	26.05	17.23	17.11	17.34	21.38
2025	19.35	17.20	19.61	14.35	13.01	13.78	16.48	30.44	29.30	18.77	18.51	17.85	19.79
2026	20.87	17.14	16.44	14.52	13.37	14.15	20.01	30.11	40.21	18.05	19.02	18.57	20.18
2027	19.54	16.80	17.01	14.75	12.91	13.54	19.22	29.71	29.21	18.69	18.79	19.18	20.52
2028	23.32	18.88	18.73	17.36	15.11	15.65	19.99	41.84	38.84	20.36	20.16	20.46	23.96
2029	26.70	22.17	21.39	16.64	14.59	16.38	22.55	50.47	49.53	23.02	22.11	22.90	27.73
2030	30.72	24.77	22.24	18.57	15.60	16.26	24.66	69.79	55.44	25.21	22.96	25.10	33.19
2031	32.98	26.87	23.58	20.51	18.75	17.64	25.95	72.95	60.06	28.16	24.89	25.64	33.17
2032	34.26	26.72	27.75	20.61	17.98	18.90	29.50	75.33	60.43	28.71	26.00	27.02	34.89
2033	1.02	2.88	1.99	1.07	1.08	1.16	1.29	(3.43)	1.01	0.93	1.89	2.73	4.23
2034	1.06	3.20	2.27	1.31	1.14	1.08	0.82	(3.86)	1.53	0.94	1.96	3.14	4.51
2035	1.07	3.48	1.97	1.28	1.15	1.58	0.95	(4.31)	1.54	1.02	2.00	2.90	4.54
2036	1.08	3.53	2.18	1.58	1.07	1.71	1.18	(5.46)	1.20	1.50	2.31	3.22	4.63

Table 4
Burnertip Natural Gas Price Forecast
Utah 2019.Q1_Solar - 80.0 MW and 31.0% CF

Year	PacifiCorp		
	Delivered IRP - Utah Greenfield Fuel Cost	Delivered IRP West Side Fuel Cost	Delivered IRP - Wyo NE Fuel Cost
2016	\$2.32	\$2.30	\$2.35
2017	\$2.65	\$3.31	\$2.66
2018	\$2.59	\$3.23	\$2.60
2019	\$2.75	\$4.37	\$2.43
2020	\$2.37	\$2.33	\$2.17
2021	\$2.25	\$2.14	\$2.13
2022	\$2.36	\$2.28	\$2.24
2023	\$2.53	\$2.49	\$2.41
2024	\$2.82	\$2.84	\$2.70
2025	\$3.19	\$3.18	\$3.06
2026	\$3.42	\$3.44	\$3.29
2027	\$3.56	\$3.60	\$3.44
2028	\$3.80	\$3.86	\$3.67
2029	\$3.94	\$4.02	\$3.81
2030	\$4.10	\$4.16	\$3.96
2031	\$4.40	\$4.45	\$4.27
2032	\$4.65	\$4.68	\$4.51
2033	\$5.04	\$5.03	\$4.89
2034	\$5.19	\$5.17	\$5.05
2035	\$5.35	\$5.27	\$5.20
2036	\$5.47	\$5.35	\$5.32
2037	\$5.87	\$5.76	\$5.72
2038	\$6.15	\$6.01	\$6.00
2039	\$6.40	\$6.25	\$6.25
2040	\$6.63	\$6.49	\$6.47
2041	\$6.86	\$6.75	\$6.70
2042	\$4.89	\$4.80	\$4.78

Official Forward Price Curve Forecast dated Mar 29, 2019

Table 5

Utah 2019.Q1_Solar - 80.0 MW and 31.0% CF
 January 2019 through December 2038
 Nominal Avoided Costs Calculated Monthly

Nominal NPV at 6.91% Discount Rate

15 Year Starting 2019 \$ 40,848,620 \$ 3,272,187 \$ 44,120,806 \$ 1,999,406 \$22.07
 15 Year Starting 2020 \$ 37,829,673 \$ 6,845,648 \$ 44,675,322 \$ 1,989,542 \$22.46

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	30.7% CF	Dollars	MWH	30.7% CF
Jan-19	203,325	-	203,325	10,534	19.30
Feb-19	466,706	-	466,706	11,790	39.59
Mar-19	336,450	-	336,450	18,247	18.44
Apr-19	314,564	-	314,564	21,209	14.83
May-19	359,220	-	359,220	24,553	14.63
Jun-19	443,026	-	443,026	26,084	16.98
Jul-19	1,524,038	-	1,524,038	23,608	64.56
Aug-19	1,027,030	-	1,027,030	23,646	43.43
Sep-19	455,598	-	455,598	20,843	21.86
Oct-19	254,540	-	254,540	16,897	15.06
Nov-19	173,733	-	173,733	11,381	15.27
Dec-19	185,745	-	185,745	8,735	21.26
Jan-20	172,542	-	172,542	10,481	16.46
Feb-20	196,490	-	196,490	12,436	15.80
Mar-20	254,597	-	254,597	18,156	14.02
Apr-20	272,330	-	272,330	21,103	12.90
May-20	319,244	-	319,244	24,430	13.07
Jun-20	412,955	-	412,955	25,954	15.91
Jul-20	1,217,267	-	1,217,267	23,490	51.82
Aug-20	655,525	-	655,525	23,527	27.86
Sep-20	396,692	-	396,692	20,738	19.13
Oct-20	238,426	-	238,426	16,813	14.18
Nov-20	63,539	-	63,539	11,324	5.61
Dec-20	131,989	-	131,989	8,692	15.19
Jan-21	127,982	-	127,982	10,429	12.27
Feb-21	142,854	-	142,854	11,672	12.24
Mar-21	164,083	-	164,083	18,065	9.08
Apr-21	203,505	-	203,505	20,998	9.69
May-21	276,869	-	276,869	24,308	11.39
Jun-21	293,198	-	293,198	25,824	11.35
Jul-21	543,582	-	543,582	23,373	23.26
Aug-21	456,861	-	456,861	23,410	19.52
Sep-21	283,174	-	283,174	20,635	13.72
Oct-21	189,533	-	189,533	16,729	11.33
Nov-21	188,831	-	188,831	11,267	16.76
Dec-21	142,315	-	142,315	8,648	16.46
Jan-22	150,685	-	150,685	10,377	14.52
Feb-22	145,957	-	145,957	11,614	12.57
Mar-22	216,058	-	216,058	17,975	12.02
Apr-22	198,726	-	198,726	20,893	9.51
May-22	311,742	-	311,742	24,186	12.89
Jun-22	310,608	-	310,608	25,695	12.09
Jul-22	433,886	-	433,886	23,256	18.66
Aug-22	441,730	-	441,730	23,293	18.96
Sep-22	236,724	-	236,724	20,532	11.53
Oct-22	220,942	-	220,942	16,645	13.27
Nov-22	142,789	-	142,789	11,211	12.74
Dec-22	136,830	-	136,830	8,605	15.90

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	30.7% CF	Dollars	MWH	30.7% CF
Jan-23	133,343	-	133,343	10,325	12.91
Feb-23	144,315	-	144,315	11,555	12.49
Mar-23	202,138	-	202,138	17,885	11.30
Apr-23	222,649	-	222,649	20,788	10.71
May-23	278,357	-	278,357	24,065	11.57
Jun-23	340,535	-	340,535	25,566	13.32
Jul-23	520,116	-	520,116	23,140	22.48
Aug-23	391,088	-	391,088	23,176	16.87
Sep-23	295,352	-	295,352	20,429	14.46
Oct-23	212,477	-	212,477	16,562	12.83
Nov-23	147,941	-	147,941	11,155	13.26
Dec-23	136,222	-	136,222	8,562	15.91
Jan-24	181,998	-	181,998	10,273	17.72
Feb-24	197,116	-	197,116	12,190	16.17
Mar-24	225,473	-	225,473	17,796	12.67
Apr-24	246,961	-	246,961	20,684	11.94
May-24	303,234	-	303,234	23,945	12.66
Jun-24	465,335	-	465,335	25,438	18.29
Jul-24	673,762	-	673,762	23,024	29.26
Aug-24	600,669	-	600,669	23,060	26.05
Sep-24	350,162	-	350,162	20,327	17.23
Oct-24	281,900	-	281,900	16,479	17.11
Nov-24	192,405	-	192,405	11,099	17.34
Dec-24	182,156	-	182,156	8,519	21.38
Jan-25	175,854	-	175,854	10,222	17.20
Feb-25	224,392	-	224,392	11,440	19.61
Mar-25	254,048	-	254,048	17,707	14.35
Apr-25	267,771	-	267,771	20,581	13.01
May-25	328,316	-	328,316	23,825	13.78
Jun-25	417,039	-	417,039	25,311	16.48
Jul-25	697,427	-	697,427	22,909	30.44
Aug-25	672,208	-	672,208	22,945	29.30
Sep-25	379,555	-	379,555	20,225	18.77
Oct-25	303,465	-	303,465	16,397	18.51
Nov-25	197,109	-	197,109	11,044	17.85
Dec-25	167,735	-	167,735	8,476	19.79
Jan-26	174,288	-	174,288	10,171	17.14
Feb-26	187,101	-	187,101	11,383	16.44
Mar-26	255,745	-	255,745	17,618	14.52
Apr-26	273,771	-	273,771	20,478	13.37
May-26	335,500	-	335,500	23,706	14.15
Jun-26	503,840	-	503,840	25,185	20.01
Jul-26	686,395	-	686,395	22,794	30.11
Aug-26	918,096	-	918,096	22,830	40.21
Sep-26	363,303	-	363,303	20,124	18.05
Oct-26	310,320	-	310,320	16,315	19.02
Nov-26	204,087	-	204,087	10,988	18.57
Dec-26	170,165	-	170,165	8,434	20.18
Jan-27	170,051	-	170,051	10,120	16.80
Feb-27	192,660	-	192,660	11,326	17.01
Mar-27	258,583	-	258,583	17,530	14.75
Apr-27	263,018	-	263,018	20,376	12.91
May-27	319,492	-	319,492	23,587	13.54
Jun-27	481,595	-	481,595	25,059	19.22
Jul-27	673,872	-	673,872	22,680	29.71
Aug-27	663,566	-	663,566	22,716	29.21
Sep-27	374,267	-	374,267	20,023	18.69
Oct-27	305,094	-	305,094	16,233	18.79
Nov-27	209,704	-	209,704	10,933	19.18
Dec-27	172,218	-	172,218	8,392	20.52

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	30.7% CF	Dollars	MWH	30.7% CF
Jan-28	190,062	-	190,062	10,069	18.88
Feb-28	223,830	-	223,830	11,948	18.73
Mar-28	302,824	-	302,824	17,442	17.36
Apr-28	306,406	-	306,406	20,274	15.11
May-28	367,322	-	367,322	23,470	15.65
Jun-28	498,542	-	498,542	24,934	19.99
Jul-28	944,103	-	944,103	22,567	41.84
Aug-28	877,984	-	877,984	22,603	38.84
Sep-28	405,702	-	405,702	19,923	20.36
Oct-28	325,640	-	325,640	16,152	20.16
Nov-28	222,588	-	222,588	10,879	20.46
Dec-28	200,044	-	200,044	8,350	23.96
Jan-29	222,114	-	222,114	10,019	22.17
Feb-29	239,834	-	239,834	11,213	21.39
Mar-29	288,791	-	288,791	17,355	16.64
Apr-29	294,392	-	294,392	20,173	14.59
May-29	382,411	-	382,411	23,352	16.38
Jun-29	559,537	-	559,537	24,809	22.55
Jul-29	1,133,216	-	1,133,216	22,454	50.47
Aug-29	1,113,851	-	1,113,851	22,490	49.53
Sep-29	456,373	-	456,373	19,824	23.02
Oct-29	355,318	-	355,318	16,071	22.11
Nov-29	247,832	-	247,832	10,824	22.90
Dec-29	230,398	-	230,398	8,308	27.73
Jan-30	246,889	-	246,889	9,969	24.77
Feb-30	248,178	-	248,178	11,157	22.24
Mar-30	320,630	-	320,630	17,268	18.57
Apr-30	313,094	-	313,094	20,072	15.60
May-30	377,815	-	377,815	23,235	16.26
Jun-30	608,623	-	608,623	24,685	24.66
Jul-30	1,559,197	-	1,559,197	22,342	69.79
Aug-30	1,240,642	-	1,240,642	22,377	55.44
Sep-30	497,283	-	497,283	19,724	25.21
Oct-30	367,230	-	367,230	15,991	22.96
Nov-30	270,336	-	270,336	10,770	25.10
Dec-30	274,374	-	274,374	8,267	33.19
Jan-31	266,572	-	266,572	9,919	26.87
Feb-31	261,767	-	261,767	11,101	23.58
Mar-31	352,459	-	352,459	17,182	20.51
Apr-31	374,549	-	374,549	19,971	18.75
May-31	407,913	-	407,913	23,119	17.64
Jun-31	637,296	-	637,296	24,561	25.95
Jul-31	1,621,704	-	1,621,704	22,230	72.95
Aug-31	1,337,227	-	1,337,227	22,265	60.06
Sep-31	552,632	-	552,632	19,626	28.16
Oct-31	396,104	-	396,104	15,911	24.89
Nov-31	274,788	-	274,788	10,716	25.64
Dec-31	272,818	-	272,818	8,225	33.17
Jan-32	263,744	-	263,744	9,869	26.72
Feb-32	324,920	-	324,920	11,710	27.75
Mar-32	352,388	-	352,388	17,096	20.61
Apr-32	357,258	-	357,258	19,871	17.98
May-32	434,776	-	434,776	23,004	18.90
Jun-32	720,911	-	720,911	24,439	29.50
Jul-32	1,666,267	-	1,666,267	22,119	75.33
Aug-32	1,338,684	-	1,338,684	22,154	60.43
Sep-32	560,566	-	560,566	19,528	28.71
Oct-32	411,679	-	411,679	15,831	26.00
Nov-32	288,135	-	288,135	10,663	27.02
Dec-32	285,571	-	285,571	8,184	34.89

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	30.7% CF	Dollars	MWH	30.7% CF
Jan-33	28,314	720,363	748,678	9,820	76.24
Feb-33	21,921	720,363	742,284	10,991	67.54
Mar-33	18,279	720,363	738,642	17,011	43.42
Apr-33	21,414	720,363	741,777	19,772	37.52
May-33	26,627	720,363	746,990	22,889	32.64
Jun-33	31,288	720,363	751,651	24,316	30.91
Jul-33	(75,450)	720,363	644,914	22,008	29.30
Aug-33	22,256	720,363	742,620	22,043	33.69
Sep-33	17,995	720,363	738,358	19,430	38.00
Oct-33	29,844	720,363	750,207	15,752	47.63
Nov-33	28,930	720,363	749,293	10,609	70.62
Dec-33	34,467	720,363	754,830	8,143	92.69
Jan-34	31,302	736,911	768,213	9,771	78.62
Feb-34	24,856	736,911	761,767	10,936	69.66
Mar-34	22,127	736,911	759,038	16,926	44.85
Apr-34	22,421	736,911	759,332	19,673	38.60
May-34	24,637	736,911	761,548	22,774	33.44
Jun-34	19,946	736,911	756,857	24,195	31.28
Jul-34	(84,537)	736,911	652,374	21,898	29.79
Aug-34	33,611	736,911	770,522	21,933	35.13
Sep-34	18,254	736,911	755,165	19,333	39.06
Oct-34	30,754	736,911	767,665	15,674	48.98
Nov-34	33,158	736,911	770,069	10,556	72.95
Dec-34	36,520	736,911	773,431	8,103	95.45
Jan-35	33,861	753,156	787,017	9,722	80.95
Feb-35	21,482	753,156	774,638	10,881	71.19
Mar-35	21,600	753,156	774,756	16,841	46.00
Apr-35	22,540	753,156	775,696	19,575	39.63
May-35	35,836	753,156	788,992	22,660	34.82
Jun-35	22,776	753,156	775,933	24,074	32.23
Jul-35	(93,878)	753,156	659,279	21,789	30.26
Aug-35	33,643	753,156	786,799	21,823	36.05
Sep-35	19,701	753,156	772,858	19,236	40.18
Oct-35	31,222	753,156	784,379	15,595	50.30
Nov-35	30,412	753,156	783,568	10,504	74.60
Dec-35	36,575	753,156	789,731	8,062	97.96
Jan-36	34,160	769,704	803,864	9,673	83.10
Feb-36	25,025	769,704	794,729	11,478	69.24
Mar-36	26,552	769,704	796,257	16,757	47.52
Apr-36	20,828	769,704	790,533	19,477	40.59
May-36	38,576	769,704	808,280	22,547	35.85
Jun-36	28,286	769,704	797,990	23,953	33.31
Jul-36	(118,342)	769,704	651,362	21,680	30.04
Aug-36	26,037	769,704	795,741	21,714	36.65
Sep-36	28,723	769,704	798,427	19,140	41.71
Oct-36	35,810	769,704	805,515	15,517	51.91
Nov-36	33,652	769,704	803,357	10,451	76.87
Dec-36	37,180	769,704	806,884	8,022	100.59
Jan-37	34,911	786,675	821,587	9,673	84.93
Feb-37	24,694	786,675	811,369	11,082	73.21
Mar-37	27,136	786,675	813,812	16,757	48.57
Apr-37	21,287	786,675	807,962	19,477	41.48
May-37	39,424	786,675	826,100	22,547	36.64
Jun-37	28,908	786,675	815,584	23,953	34.05
Jul-37	(120,946)	786,675	665,730	21,680	30.71
Aug-37	26,610	786,675	813,285	21,714	37.45
Sep-37	29,355	786,675	816,030	19,140	42.63
Oct-37	36,598	786,675	823,274	15,517	53.06
Nov-37	34,393	786,675	821,068	10,451	78.56
Dec-37	37,998	786,675	824,674	8,022	102.80

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	30.7% CF	Dollars	MWH	30.7% CF
Jan-38	35,714	804,755	840,469	9,673	86.88
Feb-38	25,261	804,755	830,016	11,082	74.90
Mar-38	27,760	804,755	832,515	16,757	49.68
Apr-38	21,776	804,755	826,531	19,477	42.44
May-38	40,331	804,755	845,086	22,547	37.48
Jun-38	29,573	804,755	834,328	23,953	34.83
Jul-38	(123,728)	804,755	681,027	21,680	31.41
Aug-38	27,222	804,755	831,977	21,714	38.31
Sep-38	30,030	804,755	834,785	19,140	43.61
Oct-38	37,440	804,755	842,195	15,517	54.28
Nov-38	35,184	804,755	839,939	10,451	80.37
Dec-38	38,872	804,755	843,627	8,022	105.17

Table 3
2017 IRP Update Utah Solar Resource-2033
31% Capacity Factor

Year	Estimated Capital Cost	Fixed Capital Cost at Real Levelized	Fixed O&M	Fixed Costs	Variable O&M	Tax Credit	Total Resource Costs	Total Resource Costs	Wind Integration Cost
	\$/kW	\$/kW-yr	\$/kW-yr	\$/MWh	\$/MWh	\$/MWh	\$/MWh	\$/kW-yr	\$/MWh
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(h)

2017 IRP Update Utah Solar Resource-2033 - 31% Capacity Factor

2016									
2017		\$0.00	\$19.69	\$7.23	\$0.00	\$0.00	\$7.23	\$19.69	\$0.62
2018		\$0.00	\$20.14	\$7.39	\$0.00	\$0.00	\$7.39	\$20.14	\$0.63
2019		\$0.00	\$20.54	\$7.54	\$0.00	\$0.00	\$7.54	\$20.54	\$0.64
2020		\$0.00	\$20.99	\$7.70	\$0.00	\$0.00	\$7.70	\$20.99	\$0.65
2021		\$0.00	\$21.49	\$7.89	\$0.00	\$0.00	\$7.89	\$21.49	\$0.67
2022		\$0.00	\$22.01	\$8.08	\$0.00	\$0.00	\$8.08	\$22.01	\$0.69
2023		\$0.00	\$22.54	\$8.27	\$0.00	\$0.00	\$8.27	\$22.54	\$0.71
2024		\$0.00	\$23.08	\$8.47	\$0.00	\$0.00	\$8.47	\$23.08	\$0.73
2025		\$0.00	\$23.61	\$8.67	\$0.00	\$0.00	\$8.67	\$23.61	\$0.75
2026		\$0.00	\$24.15	\$8.86	\$0.00	\$0.00	\$8.86	\$24.15	\$0.77
2027		\$0.00	\$24.71	\$9.07	\$0.00	\$0.00	\$9.07	\$24.71	\$0.79
2028		\$0.00	\$25.30	\$9.29	\$0.00	\$0.00	\$9.29	\$25.30	\$0.81
2029		\$0.00	\$25.91	\$9.51	\$0.00	\$0.00	\$9.51	\$25.91	\$0.83
2030		\$0.00	\$26.51	\$9.73	\$0.00	\$0.00	\$9.73	\$26.51	\$0.85
2031		\$0.00	\$27.12	\$9.95	\$0.00	\$0.00	\$9.95	\$27.12	\$0.87
2032		\$0.00	\$27.74	\$10.18	\$0.00	\$0.00	\$10.18	\$27.74	\$0.89
2033	\$1,166	\$90.00	\$28.38	\$43.45	\$0.00	\$0.00	\$43.45	\$118.38	\$0.91
2034		\$92.07	\$29.03	\$44.45	\$0.00	\$0.00	\$44.45	\$121.10	\$0.93
2035		\$94.10	\$29.67	\$45.43	\$0.00	\$0.00	\$45.43	\$123.77	\$0.95
2036		\$96.17	\$30.32	\$46.43	\$0.00	\$0.00	\$46.43	\$126.49	\$0.97
2037		\$98.29	\$30.99	\$47.45	\$0.00	\$0.00	\$47.45	\$129.28	\$0.99
2038		\$100.55	\$31.70	\$48.54	\$0.00	\$0.00	\$48.54	\$132.25	\$1.01
2039		\$102.86	\$32.43	\$49.66	\$0.00	\$0.00	\$49.66	\$135.29	\$1.03
2040		\$105.23	\$33.18	\$50.80	\$0.00	\$0.00	\$50.80	\$138.41	\$1.05
2041		\$107.65	\$33.94	\$51.97	\$0.00	\$0.00	\$51.97	\$141.59	\$1.07
2042		\$110.13	\$34.72	\$53.17	\$0.00	\$0.00	\$53.17	\$144.85	\$1.09

Sources, Inputs and Assumptions

Source:	(c)(f)	Plant Costs - 2017 IRP Update - Table 5.4 & 5.5
	(a)	Plant capacity cost
	(b)	= (a) x 0.0771966024070909
	(d)	= ((b) + (c)) / (8.76 x 31.1%)
	(g)	= (d) + (f)
	(h)	Plant Costs - 2017 IRP Update - Table 5.4 & 5.5

2017 IRP Update Utah Solar Resource-2033 - 31% Capacity Factor	
Wind	Cost and Input Assumptions

2033 \$	\$1,166	Plant capacity cost	\$/kW-yr
2017 \$	\$19.69	Fixed O&M, plus on-going capital cost	\$/kW-yr
2017 \$	0.62	Integration Cost	\$/MWH
2017 \$	\$0.00	Variable O&M	\$/MWH
2017 \$		Tax Credit \$/MWh	\$/MWH
	7.720%	Payment Factor	
	31.1%	Capacity Factor	

Company Official Inflation Forecast Dated March 29, 2019					
--	--	--	--	--	--

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

Table 3
2017 IRP Update Oregon Solar Resource-2031
29% Capacity Factor

Year	Estimated Capital Cost \$/kW (a)	Fixed Capital Cost at Real Levelized \$/kW-yr (b)	Fixed O&M \$/kW-yr (c)	Fixed Costs \$/MWh (d)	Variable O&M \$/MWh (e)	Tax Credit \$/MWh (f)	Avoided Cost (before Integration Cost) \$/MWh (g)	Total Resource Costs \$/kW-yr (h)	Wind Integration Cost \$/MWh (h)
------	--	---	------------------------------	------------------------------	-------------------------------	-----------------------------	---	---	--

2017 IRP Update Oregon Solar Resource-2031 - 29% Capacity Factor

2016									
2017			\$19.72	\$7.82	\$0.00	\$0.00	\$7.82	\$19.72	\$0.62
2018			\$20.17	\$7.99	\$0.00	\$0.00	\$7.99	\$20.17	\$0.63
2019			\$20.57	\$8.15	\$0.00	\$0.00	\$8.15	\$20.57	\$0.64
2020			\$21.02	\$8.33	\$0.00	\$0.00	\$8.33	\$21.02	\$0.65
2021			\$21.52	\$8.53	\$0.00	\$0.00	\$8.53	\$21.52	\$0.67
2022			\$22.04	\$8.74	\$0.00	\$0.00	\$8.74	\$22.04	\$0.69
2023			\$22.57	\$8.95	\$0.00	\$0.00	\$8.95	\$22.57	\$0.71
2024			\$23.11	\$9.16	\$0.00	\$0.00	\$9.16	\$23.11	\$0.73
2025			\$23.64	\$9.37	\$0.00	\$0.00	\$9.37	\$23.64	\$0.75
2026			\$24.18	\$9.58	\$0.00	\$0.00	\$9.58	\$24.18	\$0.77
2027			\$24.74	\$9.81	\$0.00	\$0.00	\$9.81	\$24.74	\$0.79
2028			\$25.33	\$10.04	\$0.00	\$0.00	\$10.04	\$25.33	\$0.81
2029			\$25.94	\$10.28	\$0.00	\$0.00	\$10.28	\$25.94	\$0.83
2030			\$26.54	\$10.52	\$0.00	\$0.00	\$10.52	\$26.54	\$0.85
2031			\$27.15	\$10.76	\$0.00	\$0.00	\$10.76	\$27.15	\$0.87
2032			\$27.77	\$11.01	\$0.00	\$0.00	\$11.01	\$27.77	\$0.89
2033	\$1,195	\$92.23	\$28.41	\$47.82	\$0.00	\$0.00	\$47.82	\$120.64	\$0.91
2034		\$94.35	\$29.06	\$48.92	\$0.00	\$0.00	\$48.92	\$123.41	\$0.93
2035		\$96.43	\$29.70	\$49.99	\$0.00	\$0.00	\$49.99	\$126.13	\$0.95
2036		\$98.55	\$30.35	\$51.09	\$0.00	\$0.00	\$51.09	\$128.90	\$0.97
2037		\$100.72	\$31.02	\$52.22	\$0.00	\$0.00	\$52.22	\$131.74	\$0.99
2038		\$103.04	\$31.73	\$53.42	\$0.00	\$0.00	\$53.42	\$134.77	\$1.01
2039		\$105.41	\$32.46	\$54.65	\$0.00	\$0.00	\$54.65	\$137.87	\$1.03
2040		\$107.83	\$33.21	\$55.90	\$0.00	\$0.00	\$55.90	\$141.04	\$1.05
2041		\$110.31	\$33.97	\$57.19	\$0.00	\$0.00	\$57.19	\$144.28	\$1.07
2042		\$112.85	\$34.75	\$58.50	\$0.00	\$0.00	\$58.50	\$147.60	\$1.09

Sources, Inputs and Assumptions

Source:	(c)(f)	Plant Costs - 2017 IRP Update - Table 5.4 & 5.5
	(a)	Plant capacity cost
	(b)	= (a) x 0.0771966024070909
	(d)	= ((b) + (c)) / (8.76 x 28.8%)
	(g)	= (d) + (f)
	(h)	Plant Costs - 2017 IRP Update - Table 5.4 & 5.5

2017 IRP Update Oregon Solar Resource-2031 - 29% Capacity Factor	
Solar	Cost and Input Assumptions

2033 \$	\$1,195	Plant capacity cost	\$/kW-yr
2017 \$	\$19.72	Fixed O&M, plus on-going capital cost	\$/kW-yr
2017 \$	0.62	Integration Cost	\$/MWH
2017 \$	\$0.00	Variable O&M	\$/MWH
2017 \$		Tax Credit	\$/MWH
	7.720%	Payment Factor	
	28.8%	Capacity Factor	

Company Official Inflation Forecast Dated March 29, 2019					
--	--	--	--	--	--

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

Appendix B.1

**Avoided Cost Prices \$/MWh
Utah 2019.Q1 Sch 38**

Year	Thermal Avoided Cost at 85.0% CF (2)	Solar Tracking Avoided Cost at 31.1% CF (2)	Wind Avoided Cost at 31.0% CF (2)	Thermal UT 2018.Q4 Filing	Solar Tracking UT 2018.Q4 Filing	Wind UT 2018.Q4 Filing	Thermal Difference	Solar Tracking Difference	Wind Difference
2020	\$21.07	\$19.95	\$18.62	\$20.33	\$20.06	\$17.01	\$0.75	(\$0.12)	\$1.61
2021	\$17.47	\$13.99	\$16.89	\$15.26	\$12.09	\$14.12	\$2.21	\$1.90	\$2.77
2022	\$17.99	\$13.75	\$15.08	\$16.16	\$12.38	\$13.53	\$1.83	\$1.37	\$1.55
2023	\$17.84	\$14.19	\$15.47	\$20.62	\$14.78	\$20.10	(\$2.77)	(\$0.60)	(\$4.63)
2024	\$23.57	\$18.33	\$22.37	\$23.45	\$17.04	\$21.67	\$0.11	\$1.29	\$0.70
2025	\$24.45	\$19.35	\$22.85	\$25.19	\$17.96	\$23.13	(\$0.74)	\$1.39	(\$0.28)
2026	\$25.88	\$20.87	\$23.83	\$25.31	\$17.37	\$23.22	\$0.57	\$3.50	\$0.62
2027	\$26.50	\$19.54	\$24.99	\$25.99	\$17.74	\$23.30	\$0.51	\$1.81	\$1.68
2028	\$30.32	\$23.32	\$28.43	\$28.01	\$20.38	\$24.30	\$2.32	\$2.94	\$4.13
2029	\$35.12	\$26.70	\$33.16	\$32.47	\$23.65	\$31.82	\$2.64	\$3.05	\$1.34
2030	\$39.43	\$30.72	\$58.05	\$40.23	\$29.17	\$39.41	(\$0.80)	\$1.56	\$18.63
2031	\$42.21	\$32.98	\$57.23	\$42.65	\$31.55	\$41.07	(\$0.43)	\$1.43	\$16.16
2032	\$43.93	\$34.26	\$57.80	\$45.43	\$32.91	\$44.71	(\$1.50)	\$1.34	\$13.10
2033	\$50.00	\$43.64	\$60.12	\$49.79	\$34.85	\$50.95	\$0.21	\$8.80	\$9.17
2034	\$52.36	\$44.88	\$61.73	\$52.30	\$38.03	\$51.81	\$0.06	\$6.86	\$9.92

15-Year Levelized Prices (Nominal) @ 6.910% Discount Rate (1) (3)

2020-2034	\$/MWh	\$28.13	\$22.46	\$29.89	\$27.74	\$20.47	\$26.05	\$0.39	\$1.99	\$3.84
								1%	10%	15%

Footnotes:

- (2) Total Avoided Costs with Capacity, based on stated CF
- (3) 15-Years: 2020 - 2034, levelized monthly

Table 1
Avoided Cost Prices
Utah 2019.Q1_Wind - 80.0 MW and 31.0% CF

Year	Capacity Price \$/kW-yr	Energy Only Price \$/MWh ⁽²⁾	Total Price @ 31.0% Capacity Factor \$/MWh
2019	\$0.00	\$24.05	\$24.05
2020	\$0.00	\$18.62	\$18.62
2021	\$0.00	\$16.89	\$16.89
2022	\$0.00	\$15.08	\$15.08
2023	\$0.00	\$15.47	\$15.47
2024	\$0.00	\$22.37	\$22.37
2025	\$0.00	\$22.85	\$22.85
2026	\$0.00	\$23.83	\$23.83
2027	\$0.00	\$24.99	\$24.99
2028	\$0.00	\$28.43	\$28.43
2029	\$0.00	\$33.16	\$33.16
2030	\$149.93	\$2.84	\$58.05
2031	\$153.38	\$0.76	\$57.23
2032	\$156.90	\$0.09	\$57.80
2033	\$160.50	\$1.03	\$60.12
2034	\$164.19	\$1.27	\$61.73
2035	\$167.81	\$0.93	\$62.71
2036	\$171.50	(\$0.69)	\$62.40
2037	\$175.26	(\$0.63)	\$63.98
2038	\$179.28	(\$0.65)	\$65.45

15 Year Starting 2019

15 year Levelized Prices (Nominal) @ 6.91% Discount Rate (1)

\$/kW \$27.57

\$/MWh \$17.95 \$28.10

15 Year Starting 2020

15 year Levelized Prices (Nominal) @ 6.91% Discount Rate (1)

\$/kW \$36.07

\$/MWh \$16.61 \$29.89

Footnotes:

(1) Discount Rate - 2017 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.Q1_Wind - 80.0 MW and 31.0% CF

Year	Annual	Winter Season					Summer Season				Winter Season		
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Energy Only													
2019	24.05	21.45	39.08	21.09	18.97	14.82	15.38	35.27	45.91	19.61	16.20	16.76	21.29
2020	18.62	17.57	18.49	16.92	15.84	14.73	14.90	31.79	25.35	18.79	14.74	15.20	15.51
2021	16.89	20.49	16.98	14.02	13.98	13.15	12.60	23.29	20.68	16.63	13.37	16.88	18.08
2022	15.08	15.80	13.04	13.19	13.39	15.25	13.46	17.74	18.47	13.77	14.46	13.52	17.24
2023	15.47	15.61	11.85	12.78	13.58	14.67	13.10	18.97	20.06	14.93	14.77	14.09	18.30
2024	22.37	21.32	17.34	17.90	21.92	17.29	21.43	28.21	29.62	22.86	20.64	21.03	24.17
2025	22.85	20.46	19.14	16.95	19.53	17.75	19.86	31.13	34.58	23.01	21.76	20.83	22.91
2026	23.83	20.74	20.54	22.77	21.04	18.40	18.67	32.80	33.13	23.58	22.35	22.74	23.74
2027	24.99	21.83	21.25	22.14	21.50	19.86	23.80	33.39	35.38	24.76	22.47	23.69	24.08
2028	28.43	22.46	22.62	25.04	24.93	21.57	25.34	42.92	46.00	27.29	24.12	23.93	26.75
2029	33.16	28.01	26.34	25.34	25.63	24.10	27.94	50.33	60.95	33.08	26.70	26.71	30.85
2030	2.84	(1.41)	(11.12)	(7.26)	(4.84)	0.59	7.92	12.60	28.27	11.13	3.52	(10.79)	(6.02)
2031	0.76	(11.46)	(22.42)	(11.92)	(8.90)	0.21	8.03	15.06	26.76	10.90	3.91	(11.72)	(5.62)
2032	0.09	(11.07)	(21.91)	(22.07)	(8.47)	0.24	8.48	13.60	27.46	12.00	4.79	(11.79)	(6.78)
2033	1.03	(14.25)	(24.77)	(13.71)	(10.24)	(0.65)	9.81	18.02	32.15	13.54	4.56	(13.86)	(7.44)
2034	1.27	(14.15)	(26.44)	(14.54)	(10.70)	(0.01)	10.17	18.18	34.10	14.48	5.12	(14.38)	(6.75)
2035	0.93	(14.65)	(29.10)	(15.31)	(12.01)	1.45	9.19	17.16	38.70	15.20	4.08	(15.81)	(8.98)
2036	(0.69)	(15.22)	(30.63)	(15.60)	(11.90)	(0.62)	7.80	20.51	37.07	13.79	2.56	(22.18)	(14.10)

Table 4
Burnertip Natural Gas Price Forecast
Utah 2019.Q1_Wind - 80.0 MW and 31.0% CF

Year	PacifiCorp		
	Delivered IRP - Utah Greenfield Fuel Cost	Delivered IRP West Side Fuel Cost	Delivered IRP - Wyo NE Fuel Cost
2016	\$2.32	\$2.30	\$2.35
2017	\$2.65	\$3.31	\$2.66
2018	\$2.59	\$3.23	\$2.60
2019	\$2.75	\$4.37	\$2.43
2020	\$2.37	\$2.33	\$2.17
2021	\$2.25	\$2.14	\$2.13
2022	\$2.36	\$2.28	\$2.24
2023	\$2.53	\$2.49	\$2.41
2024	\$2.82	\$2.84	\$2.70
2025	\$3.19	\$3.18	\$3.06
2026	\$3.42	\$3.44	\$3.29
2027	\$3.56	\$3.60	\$3.44
2028	\$3.80	\$3.86	\$3.67
2029	\$3.94	\$4.02	\$3.81
2030	\$4.10	\$4.16	\$3.96
2031	\$4.40	\$4.45	\$4.27
2032	\$4.65	\$4.68	\$4.51
2033	\$5.04	\$5.03	\$4.89
2034	\$5.19	\$5.17	\$5.05
2035	\$5.35	\$5.27	\$5.20
2036	\$5.47	\$5.35	\$5.32
2037	\$5.87	\$5.76	\$5.72
2038	\$6.15	\$6.01	\$6.00
2039	\$6.40	\$6.25	\$6.25
2040	\$6.63	\$6.49	\$6.47
2041	\$6.86	\$6.75	\$6.70
2042	\$4.89	\$4.80	\$4.78

Official Forward Price Curve Forecast dated Mar 29, 2019

Table 5

**Utah 2019.Q1_Wind - 80.0 MW and 31.0% CF
January 2019 through December 2038
Nominal Avoided Costs Calculated Monthly**

Nominal NPV at 6.91% Discount Rate

15 Year Starting 2019 \$ 36,773,204 \$ 20,796,949 \$ 57,570,153 \$ 2,048,464 \$28.10
15 Year Starting 2020 \$ 34,025,636 \$ 27,206,143 \$ 61,231,779 \$ 2,048,500 \$29.89

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	31.0% CF	Dollars	MWH	31.0% CF
Jan-19	354,030	-	354,030	16,505	21.45
Feb-19	539,394	-	539,394	13,802	39.08
Mar-19	355,805	-	355,805	16,868	21.09
Apr-19	275,181	-	275,181	14,505	18.97
May-19	212,020	-	212,020	14,310	14.82
Jun-19	275,885	-	275,885	17,935	15.38
Jul-19	727,308	-	727,308	20,620	35.27
Aug-19	987,127	-	987,127	21,503	45.91
Sep-19	412,832	-	412,832	21,047	19.61
Oct-19	327,457	-	327,457	20,215	16.20
Nov-19	337,364	-	337,364	20,132	16.76
Dec-19	422,227	-	422,227	19,837	21.29
Jan-20	289,952	-	289,952	16,505	17.57
Feb-20	258,924	-	258,924	14,003	18.49
Mar-20	285,370	-	285,370	16,868	16.92
Apr-20	229,748	-	229,748	14,505	15.84
May-20	210,803	-	210,803	14,310	14.73
Jun-20	267,169	-	267,169	17,935	14.90
Jul-20	655,402	-	655,402	20,620	31.79
Aug-20	545,101	-	545,101	21,503	25.35
Sep-20	395,402	-	395,402	21,047	18.79
Oct-20	297,893	-	297,893	20,215	14.74
Nov-20	305,994	-	305,994	20,132	15.20
Dec-20	307,718	-	307,718	19,837	15.51
Jan-21	338,193	-	338,193	16,505	20.49
Feb-21	234,391	-	234,391	13,802	16.98
Mar-21	236,523	-	236,523	16,868	14.02
Apr-21	202,713	-	202,713	14,505	13.98
May-21	188,174	-	188,174	14,310	13.15
Jun-21	226,046	-	226,046	17,935	12.60
Jul-21	480,274	-	480,274	20,620	23.29
Aug-21	444,677	-	444,677	21,503	20.68
Sep-21	350,044	-	350,044	21,047	16.63
Oct-21	270,343	-	270,343	20,215	13.37
Nov-21	339,742	-	339,742	20,132	16.88
Dec-21	358,683	-	358,683	19,837	18.08
Jan-22	260,810	-	260,810	16,505	15.80
Feb-22	179,935	-	179,935	13,802	13.04
Mar-22	222,524	-	222,524	16,868	13.19
Apr-22	194,219	-	194,219	14,505	13.39
May-22	218,200	-	218,200	14,310	15.25
Jun-22	241,432	-	241,432	17,935	13.46
Jul-22	365,863	-	365,863	20,620	17.74
Aug-22	397,154	-	397,154	21,503	18.47
Sep-22	289,838	-	289,838	21,047	13.77
Oct-22	292,354	-	292,354	20,215	14.46
Nov-22	272,105	-	272,105	20,132	13.52
Dec-22	341,902	-	341,902	19,837	17.24

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	31.0% CF	Dollars	MWH	31.0% CF
Jan-23	257,634	-	257,634	16,505	15.61
Feb-23	163,591	-	163,591	13,802	11.85
Mar-23	215,490	-	215,490	16,868	12.78
Apr-23	197,023	-	197,023	14,505	13.58
May-23	209,872	-	209,872	14,310	14.67
Jun-23	234,968	-	234,968	17,935	13.10
Jul-23	391,193	-	391,193	20,620	18.97
Aug-23	431,273	-	431,273	21,503	20.06
Sep-23	314,207	-	314,207	21,047	14.93
Oct-23	298,663	-	298,663	20,215	14.77
Nov-23	283,689	-	283,689	20,132	14.09
Dec-23	362,933	-	362,933	19,837	18.30
Jan-24	351,835	-	351,835	16,505	21.32
Feb-24	242,827	-	242,827	14,003	17.34
Mar-24	301,911	-	301,911	16,868	17.90
Apr-24	317,893	-	317,893	14,505	21.92
May-24	247,398	-	247,398	14,310	17.29
Jun-24	384,390	-	384,390	17,935	21.43
Jul-24	581,591	-	581,591	20,620	28.21
Aug-24	636,876	-	636,876	21,503	29.62
Sep-24	481,187	-	481,187	21,047	22.86
Oct-24	417,151	-	417,151	20,215	20.64
Nov-24	423,362	-	423,362	20,132	21.03
Dec-24	479,512	-	479,512	19,837	24.17
Jan-25	337,603	-	337,603	16,505	20.46
Feb-25	264,232	-	264,232	13,802	19.14
Mar-25	285,942	-	285,942	16,868	16.95
Apr-25	283,259	-	283,259	14,505	19.53
May-25	253,949	-	253,949	14,310	17.75
Jun-25	356,234	-	356,234	17,935	19.86
Jul-25	641,976	-	641,976	20,620	31.13
Aug-25	743,652	-	743,652	21,503	34.58
Sep-25	484,249	-	484,249	21,047	23.01
Oct-25	439,942	-	439,942	20,215	21.76
Nov-25	419,244	-	419,244	20,132	20.83
Dec-25	454,487	-	454,487	19,837	22.91
Jan-26	342,301	-	342,301	16,505	20.74
Feb-26	283,541	-	283,541	13,802	20.54
Mar-26	384,071	-	384,071	16,868	22.77
Apr-26	305,128	-	305,128	14,505	21.04
May-26	263,342	-	263,342	14,310	18.40
Jun-26	334,799	-	334,799	17,935	18.67
Jul-26	676,260	-	676,260	20,620	32.80
Aug-26	712,440	-	712,440	21,503	33.13
Sep-26	496,393	-	496,393	21,047	23.58
Oct-26	451,753	-	451,753	20,215	22.35
Nov-26	457,747	-	457,747	20,132	22.74
Dec-26	470,837	-	470,837	19,837	23.74
Jan-27	360,217	-	360,217	16,505	21.83
Feb-27	293,350	-	293,350	13,802	21.25
Mar-27	373,534	-	373,534	16,868	22.14
Apr-27	311,928	-	311,928	14,505	21.50
May-27	284,236	-	284,236	14,310	19.86
Jun-27	426,937	-	426,937	17,935	23.80
Jul-27	688,426	-	688,426	20,620	33.39
Aug-27	760,883	-	760,883	21,503	35.38
Sep-27	521,181	-	521,181	21,047	24.76
Oct-27	454,263	-	454,263	20,215	22.47
Nov-27	476,889	-	476,889	20,132	23.69
Dec-27	477,728	-	477,728	19,837	24.08

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	31.0% CF	Dollars	MWH	31.0% CF
Jan-28	370,692	-	370,692	16,505	22.46
Feb-28	316,715	-	316,715	14,003	22.62
Mar-28	422,389	-	422,389	16,868	25.04
Apr-28	361,555	-	361,555	14,505	24.93
May-28	308,638	-	308,638	14,310	21.57
Jun-28	454,421	-	454,421	17,935	25.34
Jul-28	885,029	-	885,029	20,620	42.92
Aug-28	989,053	-	989,053	21,503	46.00
Sep-28	574,357	-	574,357	21,047	27.29
Oct-28	487,607	-	487,607	20,215	24.12
Nov-28	481,751	-	481,751	20,132	23.93
Dec-28	530,570	-	530,570	19,837	26.75
Jan-29	462,324	-	462,324	16,505	28.01
Feb-29	363,543	-	363,543	13,802	26.34
Mar-29	427,448	-	427,448	16,868	25.34
Apr-29	371,698	-	371,698	14,505	25.63
May-29	344,938	-	344,938	14,310	24.10
Jun-29	501,091	-	501,091	17,935	27.94
Jul-29	1,037,808	-	1,037,808	20,620	50.33
Aug-29	1,310,645	-	1,310,645	21,503	60.95
Sep-29	696,171	-	696,171	21,047	33.08
Oct-29	539,812	-	539,812	20,215	26.70
Nov-29	537,640	-	537,640	20,132	26.71
Dec-29	612,020	-	612,020	19,837	30.85
Jan-30	(23,293)	999,533	976,241	16,505	59.15
Feb-30	(153,535)	999,533	845,998	13,802	61.30
Mar-30	(122,395)	999,533	877,138	16,868	52.00
Apr-30	(70,165)	999,533	929,368	14,505	64.07
May-30	8,441	999,533	1,007,974	14,310	70.44
Jun-30	142,122	999,533	1,141,655	17,935	63.65
Jul-30	259,718	999,533	1,259,251	20,620	61.07
Aug-30	607,983	999,533	1,607,517	21,503	74.76
Sep-30	234,306	999,533	1,233,839	21,047	58.62
Oct-30	71,089	999,533	1,070,622	20,215	52.96
Nov-30	(217,241)	999,533	782,292	20,132	38.86
Dec-30	(119,369)	999,533	880,164	19,837	44.37
Jan-31	(189,171)	1,022,533	833,363	16,505	50.49
Feb-31	(309,504)	1,022,533	713,029	13,802	51.66
Mar-31	(200,991)	1,022,533	821,542	16,868	48.70
Apr-31	(129,114)	1,022,533	893,419	14,505	61.59
May-31	3,051	1,022,533	1,025,584	14,310	71.67
Jun-31	144,064	1,022,533	1,166,597	17,935	65.04
Jul-31	310,447	1,022,533	1,332,980	20,620	64.65
Aug-31	575,448	1,022,533	1,597,981	21,503	74.31
Sep-31	229,438	1,022,533	1,251,972	21,047	59.48
Oct-31	79,056	1,022,533	1,101,589	20,215	54.49
Nov-31	(235,897)	1,022,533	786,637	20,132	39.07
Dec-31	(111,538)	1,022,533	910,995	19,837	45.92
Jan-32	(182,674)	1,046,000	863,326	16,505	52.31
Feb-32	(306,852)	1,046,000	739,148	14,003	52.79
Mar-32	(372,245)	1,046,000	673,755	16,868	39.94
Apr-32	(122,822)	1,046,000	923,178	14,505	63.64
May-32	3,404	1,046,000	1,049,404	14,310	73.33
Jun-32	152,015	1,046,000	1,198,015	17,935	66.80
Jul-32	280,421	1,046,000	1,326,421	20,620	64.33
Aug-32	590,445	1,046,000	1,636,445	21,503	76.10
Sep-32	252,666	1,046,000	1,298,666	21,047	61.70
Oct-32	96,781	1,046,000	1,142,781	20,215	56.53
Nov-32	(237,310)	1,046,000	808,690	20,132	40.17
Dec-32	(134,503)	1,046,000	911,497	19,837	45.95

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	31.0% CF	Dollars	MWH	31.0% CF
Jan-33	(235,254)	1,070,000	834,746	16,505	50.58
Feb-33	(341,833)	1,070,000	728,167	13,802	52.76
Mar-33	(231,225)	1,070,000	838,775	16,868	49.73
Apr-33	(148,523)	1,070,000	921,477	14,505	63.53
May-33	(9,277)	1,070,000	1,060,723	14,310	74.12
Jun-33	175,974	1,070,000	1,245,974	17,935	69.47
Jul-33	371,483	1,070,000	1,441,483	20,620	69.91
Aug-33	691,379	1,070,000	1,761,379	21,503	81.91
Sep-33	285,070	1,070,000	1,355,070	21,047	64.38
Oct-33	92,202	1,070,000	1,162,202	20,215	57.49
Nov-33	(279,093)	1,070,000	790,907	20,132	39.29
Dec-33	(147,670)	1,070,000	922,330	19,837	46.50
Jan-34	(233,528)	1,094,600	861,072	16,505	52.17
Feb-34	(364,938)	1,094,600	729,662	13,802	52.87
Mar-34	(245,195)	1,094,600	849,405	16,868	50.36
Apr-34	(155,163)	1,094,600	939,437	14,505	64.77
May-34	(148)	1,094,600	1,094,452	14,310	76.48
Jun-34	182,476	1,094,600	1,277,076	17,935	71.20
Jul-34	374,853	1,094,600	1,469,453	20,620	71.27
Aug-34	733,262	1,094,600	1,827,862	21,503	85.00
Sep-34	304,848	1,094,600	1,399,448	21,047	66.49
Oct-34	103,576	1,094,600	1,198,176	20,215	59.27
Nov-34	(289,457)	1,094,600	805,143	20,132	39.99
Dec-34	(133,960)	1,094,600	960,640	19,837	48.43
Jan-35	(241,796)	1,118,733	876,938	16,505	53.13
Feb-35	(401,575)	1,118,733	717,158	13,802	51.96
Mar-35	(258,296)	1,118,733	860,437	16,868	51.01
Apr-35	(174,220)	1,118,733	944,514	14,505	65.12
May-35	20,701	1,118,733	1,139,434	14,310	79.62
Jun-35	164,755	1,118,733	1,283,489	17,935	71.56
Jul-35	353,832	1,118,733	1,472,565	20,620	71.42
Aug-35	832,221	1,118,733	1,950,954	21,503	90.73
Sep-35	320,016	1,118,733	1,438,750	21,047	68.36
Oct-35	82,403	1,118,733	1,201,136	20,215	59.42
Nov-35	(318,226)	1,118,733	800,508	20,132	39.76
Dec-35	(178,086)	1,118,733	940,647	19,837	47.42
Jan-36	(251,270)	1,143,333	892,063	16,505	54.05
Feb-36	(428,921)	1,143,333	714,413	14,003	51.02
Mar-36	(263,093)	1,143,333	880,240	16,868	52.18
Apr-36	(172,642)	1,143,333	970,691	14,505	66.92
May-36	(8,843)	1,143,333	1,134,491	14,310	79.28
Jun-36	139,817	1,143,333	1,283,150	17,935	71.54
Jul-36	422,905	1,143,333	1,566,239	20,620	75.96
Aug-36	797,162	1,143,333	1,940,495	21,503	90.24
Sep-36	290,147	1,143,333	1,433,480	21,047	68.11
Oct-36	51,748	1,143,333	1,195,081	20,215	59.12
Nov-36	(446,530)	1,143,333	696,804	20,132	34.61
Dec-36	(279,705)	1,143,333	863,629	19,837	43.54
Jan-37	(256,798)	1,168,400	911,602	16,505	55.23
Feb-37	(423,241)	1,168,400	745,159	13,520	55.12
Mar-37	(268,881)	1,168,400	899,519	16,868	53.33
Apr-37	(176,440)	1,168,400	991,960	14,505	68.39
May-37	(9,037)	1,168,400	1,159,363	14,310	81.02
Jun-37	142,893	1,168,400	1,311,293	17,935	73.11
Jul-37	432,209	1,168,400	1,600,609	20,620	77.63
Aug-37	814,699	1,168,400	1,983,099	21,503	92.22
Sep-37	296,530	1,168,400	1,464,930	21,047	69.60
Oct-37	52,886	1,168,400	1,221,286	20,215	60.42
Nov-37	(456,353)	1,168,400	712,047	20,132	35.37
Dec-37	(285,858)	1,168,400	882,542	19,837	44.49

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	31.0% CF	Dollars	MWH	31.0% CF
Jan-38	(262,704)	1,195,200	932,496	16,505	56.50
Feb-38	(432,976)	1,195,200	762,224	13,520	56.38
Mar-38	(275,065)	1,195,200	920,135	16,868	54.55
Apr-38	(180,499)	1,195,200	1,014,701	14,505	69.95
May-38	(9,245)	1,195,200	1,185,955	14,310	82.88
Jun-38	146,180	1,195,200	1,341,380	17,935	74.79
Jul-38	442,150	1,195,200	1,637,350	20,620	79.41
Aug-38	833,437	1,195,200	2,028,637	21,503	94.34
Sep-38	303,351	1,195,200	1,498,551	21,047	71.20
Oct-38	54,102	1,195,200	1,249,302	20,215	61.80
Nov-38	(466,849)	1,195,200	728,351	20,132	36.18
Dec-38	(292,433)	1,195,200	902,767	19,837	45.51

Table 3
2017 IRP Update Wyoming DJ Wind Resource
41% Capacity Factor

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

2017 IRP Update Wyoming DJ Wind Resource - 41% Capacity Factor

2016									
2017			\$37.57	\$10.38	\$0.65	\$0.00	\$11.03	\$39.92	\$0.59
2018			\$38.43	\$10.62	\$0.66	\$0.00	\$11.28	\$40.82	\$0.60
2019			\$39.20	\$10.84	\$0.67	\$0.00	\$11.51	\$41.62	\$0.61
2020			\$40.06	\$11.07	\$0.68	\$0.00	\$11.75	\$42.52	\$0.62
2021			\$41.02	\$11.34	\$0.70	\$0.00	\$12.04	\$43.55	\$0.63
2022			\$42.00	\$11.61	\$0.72	\$0.00	\$12.33	\$44.60	\$0.65
2023			\$43.01	\$11.89	\$0.74	\$0.00	\$12.63	\$45.69	\$0.67
2024			\$44.04	\$12.17	\$0.76	\$0.00	\$12.93	\$46.79	\$0.69
2025			\$45.05	\$12.45	\$0.78	\$0.00	\$13.23	\$47.87	\$0.71
2026			\$46.09	\$12.74	\$0.80	\$0.00	\$13.54	\$48.98	\$0.73
2027			\$47.15	\$13.03	\$0.82	\$0.00	\$13.85	\$50.12	\$0.75
2028			\$48.28	\$13.34	\$0.84	\$0.00	\$14.18	\$51.32	\$0.77
2029			\$49.44	\$13.67	\$0.86	\$0.00	\$14.53	\$52.55	\$0.79
2030	\$1,353	\$96.16	\$50.58	\$40.56	\$0.88	\$0.00	\$41.44	\$149.93	\$0.81
2031		\$98.38	\$51.74	\$41.49	\$0.90	\$0.00	\$42.39	\$153.38	\$0.83
2032		\$100.64	\$52.93	\$42.45	\$0.92	\$0.00	\$43.37	\$156.90	\$0.85
2033		\$102.95	\$54.15	\$43.42	\$0.94	\$0.00	\$44.36	\$160.50	\$0.87
2034		\$105.32	\$55.40	\$44.42	\$0.96	\$0.00	\$45.38	\$164.19	\$0.89
2035		\$107.64	\$56.62	\$45.40	\$0.98	\$0.00	\$46.38	\$167.81	\$0.91
2036		\$110.01	\$57.87	\$46.40	\$1.00	\$0.00	\$47.40	\$171.50	\$0.93
2037		\$112.43	\$59.14	\$47.42	\$1.02	\$0.00	\$48.44	\$175.26	\$0.95
2038		\$115.02	\$60.50	\$48.51	\$1.04	\$0.00	\$49.55	\$179.28	\$0.97
2039		\$117.67	\$61.89	\$49.63	\$1.06	\$0.00	\$50.69	\$183.39	\$0.99
2040		\$120.38	\$63.31	\$50.77	\$1.08	\$0.00	\$51.85	\$187.60	\$1.01
2041		\$123.15	\$64.77	\$51.94	\$1.10	\$0.00	\$53.04	\$191.90	\$1.03
2042		\$125.98	\$66.26	\$53.14	\$1.13	\$0.00	\$54.27	\$196.33	\$1.05

Sources, Inputs and Assumptions

Source:	(c)(f)	Plant Costs - 2017 IRP Update - Table 5.4 & 5.5
	(a)	Plant capacity cost
	(b)	= (a) x 0.0710599128799291
	(d)	= ((b) + (c)) / (8.76 x 41.3%)
	(g)	= (d) + (f)
	(i)	Plant Costs - 2017 IRP Update - Table 5.4 & 5.5

2017 IRP Update Wyoming DJ Wind Resource - 41% Capacity Factor

Wind Cost and Input Assumptions

2030 \$	\$1,353	Plant capacity cost	\$/kW-yr
2017 \$	\$37.57	Fixed O&M, plus on-going capital cost	\$/kW-yr
2017 \$	0.59	Integration Cost	\$/MWH
2017 \$	\$0.65	Variable O&M	\$/MWH
2017 \$		Tax Credit \$/MWh	\$/MWH

7.106% Payment Factor

43% Capacity Factor

41% Supply Side tables

Company Official Inflation Forecast Dated March 29, 2019

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

ROCKY MOUNTAIN POWER

STEP STUDY BETWEEN PRIOR FILING AND CURRENT FILING

2019.Q1 – April 2019

Nominal Levelized Payment at 6.910% Discount Rate

	2020 - 2034	2021 - 2035
2018.Q4 As Filed	\$27.76	\$29.60
OFPC	-\$1.78	-\$1.95
Generic	\$1.16	\$1.26
Queue	\$1.04	\$1.18
2019.Q1 As Filed	\$28.18	\$30.09

Appendix C

Utah Quarterly Compliance Filing Step Study between 2019.Q1 and 2018.Q4 Compliance Filing Avoided Cost Impact of Changing Assumptions \$/MWH (1)

Year	OFPC (2)	Generic	Queue	Total Impact
2019	\$ 3.65	\$ 0.92	\$ (0.70)	\$ 3.87
2020	\$ 0.92	\$ 0.02	\$ (0.19)	\$ 0.75
2021	\$ 1.20	\$ 0.50	\$ 0.50	\$ 2.21
2022	\$ (0.32)	\$ 0.96	\$ 1.19	\$ 1.83
2023	\$ (4.77)	\$ 1.21	\$ 0.78	\$ (2.77)
2024	\$ (5.50)	\$ 4.42	\$ 1.19	\$ 0.11
2025	\$ (2.13)	\$ 1.12	\$ 0.27	\$ (0.74)
2026	\$ (2.01)	\$ 0.87	\$ 1.72	\$ 0.57
2027	\$ (2.01)	\$ 1.05	\$ 1.46	\$ 0.51
2028	\$ 0.09	\$ 1.04	\$ 1.18	\$ 2.32
2029	\$ 0.28	\$ 0.66	\$ 1.70	\$ 2.64
2030	\$ (3.88)	\$ 1.40	\$ 1.67	\$ (0.80)
2031	\$ (3.23)	\$ 1.09	\$ 1.70	\$ (0.43)
2032	\$ (5.20)	\$ 1.94	\$ 1.77	\$ (1.50)
2033	\$ (1.51)	\$ 0.69	\$ 1.03	\$ 0.21
2034	\$ (1.75)	\$ 0.60	\$ 1.22	\$ 0.06
2035	\$ 1.29	\$ 0.51	\$ 1.30	\$ 3.10
2036	\$ 0.79	\$ 0.71	\$ 1.20	\$ 2.70

Nominal Levelized Payment at 6.910% Discount Rate (3)

2020 - 2034	\$ (1.78)	\$ 1.16	\$ 1.04	\$ 0.42
2021 - 2035	\$ (1.95)	\$ 1.26	\$ 1.18	\$ 0.49

- (1) Studies are sequential. The order of the studies would affect the price impact.
- (2) Official Forward Price Curve Dated March 2019
- (3) Discount Rate - 2017 IRP Update

Appendix C

Utah Quarterly Compliance Filing Step Study between 2019.Q1 and 2018.Q4 Compliance Filing Total Avoided Cost Prices \$/MWH (1) (4)

Year	2018.Q4 As Filed	OFPC (2)	Generic	Queue
2019	\$23.35	\$27.00	\$27.91	\$27.22
2020	\$20.33	\$21.24	\$21.26	\$21.07
2021	\$15.26	\$16.47	\$16.97	\$17.47
2022	\$16.16	\$15.84	\$16.80	\$17.99
2023	\$20.62	\$15.85	\$17.06	\$17.84
2024	\$23.45	\$17.95	\$22.38	\$23.57
2025	\$25.19	\$23.06	\$24.17	\$24.45
2026	\$25.31	\$23.30	\$24.17	\$25.88
2027	\$25.99	\$23.99	\$25.04	\$26.50
2028	\$28.01	\$28.10	\$29.14	\$30.32
2029	\$32.47	\$32.76	\$33.42	\$35.12
2030	\$40.23	\$36.35	\$37.75	\$39.43
2031	\$42.65	\$39.42	\$40.51	\$42.21
2032	\$45.43	\$40.23	\$42.17	\$43.93
2033	\$49.79	\$48.29	\$48.98	\$50.00
2034	\$52.30	\$50.55	\$51.15	\$52.36
2035	\$53.41	\$54.70	\$55.21	\$56.51
2036	\$55.63	\$56.41	\$57.13	\$58.32

Nominal Levelized Payment at 6.910% Discount Rate (3)

2019 - 2033	\$26.39	\$25.17	\$26.32	\$27.17
2020 - 2034	\$27.76	\$25.98	\$27.14	\$28.18
2021 - 2035	\$29.60	\$27.65	\$28.91	\$30.09

- (1) Studies are sequential. The order of the studies would affect the price impact.
- (2) Official Forward Price Curve Dated March 2019
- (3) Discount Rate - 2017 IRP Update
- (4) Capacity costs are allocated assuming an 100% capacity factor.

Appendix C

Utah Quarterly Compliance Filing Step Study between 2019.Q1 and 2018.Q4 Compliance Filing GRID Calculated Energy Avoided Cost Prices \$/MWH (1)

Year	2018.Q4 As Filed	OFPC	Generic	Queue
2019	\$23.35	\$27.00	\$27.91	\$27.22
2020	\$20.33	\$21.24	\$21.26	\$21.07
2021	\$15.26	\$16.47	\$16.97	\$17.47
2022	\$16.16	\$15.84	\$16.80	\$17.99
2023	\$20.62	\$15.85	\$17.06	\$17.84
2024	\$23.45	\$17.95	\$22.38	\$23.57
2025	\$25.19	\$23.06	\$24.17	\$24.45
2026	\$25.31	\$23.30	\$24.17	\$25.88
2027	\$25.99	\$23.99	\$25.04	\$26.50
2028	\$28.01	\$28.10	\$29.14	\$30.32
2029	\$32.47	\$32.76	\$33.42	\$35.12
2030	\$40.23	\$36.35	\$37.75	\$39.43
2031	\$42.65	\$39.42	\$40.51	\$42.21
2032	\$45.43	\$40.23	\$42.17	\$43.93
2033	\$49.79	\$48.29	\$48.98	\$50.00
2034	\$52.30	\$50.55	\$51.15	\$52.36
2035	\$53.41	\$54.70	\$55.21	\$56.51
2036	\$55.63	\$56.41	\$57.13	\$58.32

Nominal Levelized Payment at 6.91% Discount Rate (3) (4)

2019 - 2033	\$26.39	\$25.17	\$26.32	\$27.17
2020 - 2034	\$27.77	\$25.98	\$27.14	\$28.18
2021 - 2035	\$29.61	\$27.65	\$28.91	\$30.09

- (1) Studies are sequential. The order of the studies would affect the price impact.
- (2) Official Forward Price Curve Dated March 2019
- (3) Discount Rate - 2017 IRP Update

Appendix C

**Utah Quarterly Compliance Filing
Step Study between 2019.Q1 and 2018.Q4 Compliance Filing
Capacity Avoided Cost Prices**

Year	\$/kW-Year		\$/MWH (1)	
	2018.Q4 (3)	2019.Q1 (3)	2018.Q4 (3)	2019.Q1 (3)
2019	-	-	-	-
2020	-	-	-	-
2021	-	-	-	-
2022	-	-	-	-
2023	-	-	-	-
2024	-	-	-	-
2025	-	-	-	-
2026	-	-	-	-
2027	-	-	-	-
2028	-	-	-	-
2029	-	-	-	-
2030	-	-	-	-
2031	-	-	-	-
2032	-	-	-	-
2033	-	-	-	-
2034	-	-	-	-
2035	-	-	-	-
2036	-	-	-	-

Nominal Levelized Payment at 6.910% Discount Rate (2)

2019 - 2033	\$0.00	\$0.00	\$0.00	\$0.00
2020 - 2034	\$0.00	\$0.00	\$0.00	\$0.00
2021 - 2035	\$0.00	\$0.00	\$0.00	\$0.00

(1) Capacity costs are allocated assuming an 85% capacity factor.

(2) (3) Discount Rate - 2017 IRP Update

(3) No Capacity costs-All of the 2017 IRP Thermal resources are deferred due to the size of the Queue

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing **Quarterly Compliance Filing – Avoided Cost Input Changes** in Docket No. 19-035-18 was served upon the following by email on April 30, 2019.

Assistant Attorney General

Justin Jetter
Patricia Schmid
Robert Moore

jjetter@agutah.gov
Pschmid@agutah.gov
rmoore@agutah.gov

Office of Consumer Services

Cheryl Murray
Michele Beck
Bela Vastag

cmurray@utah.gov
mbeck@utah.gov
bvastag@utah.gov

Division of Public Utilities

Chris Parker
William Powell

ChrisParker@utah.gov
wpowell@utah.gov
dpudatarequest@utah.gov

Energy Strategies LLC

Kelly Francone
Neal Townsend
Gregory L. Probst

kfrancone@energystrat.com
ntownsend@energystrat.com
gprobst@earthlink.net

Callister Nebeker & McCullough

Stephen F. Mecham

sfmecham@cnmlaw.com

Hatch James & Dodge

Gary A. Dodge

gdodge@hjdllaw.com

E-Quant Consulting, Inc.

Roger Swenson

Roger.swenson@prodigy.net

Holland & Hart, LLP

James W. Holtkamp
Thor Nelson

jholtkamp@hollandhart.com
tnelson@hollandhart.com

Wasatch Wind LLC

Richard Collins & Tracy Livingston Mikell

rcollins@westminstercollege.edu

FEA

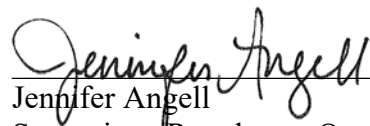
Lt. Col. Karen White

Karen.white@tyndall.af.mil

Utah Clean Energy

Kate Bowman

kate@utahcleanenergy.org


Jennifer Angell

Supervisor, Regulatory Operations