



1407 W. North Temple  
Salt Lake City, Utah 84116

December 21, 2017

***VIA ELECTRONIC FILING***

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

Attn: Gary Widerburg  
Commission Secretary

Re: **Docket 03-035-14 – Quarterly Compliance Filing – 2017.Q3 Avoided Cost Input Changes**  
**Docket 17-035-37 – 2017.Q3 Avoided Cost Input Changes Quarterly Compliance Filing**

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

Public Service Commission of Utah (Commission) orders dated October 31, 2005, and February 2, 2006, in Docket No. 03-035-14 require the Company to keep a record of any changes, including data inputs, made to the Proxy model and the Generation and Regulation Initiative Decision Tool (GRID) model used in calculating avoided costs. The orders further require the Company to notify the Commission and Division of Public Utilities (DPU) of updates made to the models used in the approved Proxy and Partial Displacement Differential Revenue Requirement (PDDRR) avoided cost methodologies. The Commission order dated June 9, 2015 in Docket 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.

Comments were filed challenging routine and non-routine changes identified in the Company's previous compliance filing, which was submitted to the Commission on June 21, 2017. Pending resolution of these issues in docket 17-035-37, the proposed non-routine updates are not being incorporated in avoided cost pricing.

**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 September 29, 2017 (1709 OFPC).

3. **Qualifying Facility (QF) Queue** – Update the QF queue to reflect current potential QFs. The QF queue was revised to include 5,825 MW nameplate in this filing. The potential queue was 5,775 MW nameplate in the 2017.Q2 filing.

**Non-Routine Updates**

The Company has not identified any non-routine updates in this 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. **Proxy / Partial Displacement Differential Revenue Requirement (PDDRR) Avoided Cost Methodology** – The proxy resources used in the PDDRR avoided cost methodology are consistent with the Company’s 2017 Integrated Resource Plan (IRP) filed with the Commission on April 4, 2017. The 2017 IRP preferred portfolio includes cost-effective solar and wind resources. The proxy thermal QF resource partially displaces summer and winter front office transactions (FOT) since all thermal resources in the 2017 preferred portfolio are fully displaced by the QF queue. The proxy tracking solar QF resource partially displaces summer and winter FOTs during 2017-2034 and the Utah South solar resource from the 2017 IRP preferred portfolio in 2035. The proxy wind QF resource partially displaces summer and winter FOTs during 2017-2035 and the Goshen wind resource in the 2017 IRP preferred portfolio in 2036.
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 \$0.30/MWh.
  - a. Avoided costs presented in **Appendix B.1** were calculated assuming a 100 MW 85 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 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

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

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

**ROCKY MOUNTAIN POWER**  
**DOCKET 03-035-14 AND DOCKET 17-035-37**  
**DESCRIPTION OF AVOIDED COST INPUT CHANGES**  
**2017.Q3 - DECEMBER 2017**

## Appendix A

### **PacifiCorp Avoided Cost (Partial Displacement Differential Revenue Requirement (PDDRR)) Model Updates through December 2017 Docket 03-035-14 / Docket 17-035-37**

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Assumptions that have changed since the 2017.Q2 compliance filing are in **bold and underline**.

#### **GRID Scenario Study Period**

- January 1, 2018 through December 31, 2032 - 15-year study.
- Avoided cost prices starting in January 2018.

#### **Official Forward Price Curve (OFPC) (Gas and Electric Market Prices)**

- **Updated to PacifiCorp's Sep. 29, 2017 OFPC (1709 OFPC)**
- OFPC reflecting the changes in forecasted prices inclusive of the impact of the United States (U.S.) Environmental Protection Agency's (EPA) Clean Power Plan final rule.

#### **Fuel Prices (Coal)**

- Average and incremental coal costs based on forecast dated August 2017.
- Coal burn expense reflects incremental coal costs and coal take or pay minimum burn levels.

#### **Integrated Resource Plan (IRP) Resources**

- 2017 IRP filed with the Public Service Commission of Utah (UPSC) on April 4, 2017.
- Resource additions, including generating resources, and front office transactions (FOT), consistent with 2017 IRP (Table 8.17).
- Existing plant retirement consistent with 2017 IRP (Table 5.3).
- 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.

#### **Hydro Resources**

- 2017 hydro forecast prepared March 2017.
- 2017 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**

- 6.57 percent discount rate - 2017 IRP
- Discount rate is consistent with UPSC's order in Docket 11-035-T06.

## **Inflation Rates**

- Company's inflation rate forecast dated September 2017.

## **Levelized Prices (Nominal) @ 6.57 percent Discount Rate**

- 15 years 2018 through 2032.
- Levelized prices are for illustrative purposes only.

## **Load Forecast (Retail)**

- 20-year load forecast from July 2017 (Fall 2017 Load Forecast).

## **Long-Term Contracts**

- Long-term contracts which have prices that are indexed to market are consistent with the 1709 OFPC.
- Contracts are modeled based on 48 months ended June 2017.
- Qualifying Facility (QF) power purchase agreements (PPA) are assumed to terminate and not renew at the end of their current PPA term.
- Incorporates signed QF PPAs.

## **Market Capacity**

- Capacity set at 48-month average of all short-term firm (STF) sales ended June 2017.
- 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 October 2017

## **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 NERC / WECC 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.

### Short-Term Firm (STF) Transactions

- Executed STF contracts as of October 2017.

### Size of the Avoided Cost Resource

- The avoided cost thermal resource is 100 MW with an 85 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 June 2017.

### Wind and Solar Resources

- Existing wind generation profiles modeled using 2016 actual generation shape.
- Wind generation shaped to hourly using 2016 actual generation shape<sup>1</sup>.
- Solar generation modeled using 12x24 profiles.
- Capacity contribution values used in this study reflect the values from the 2017 IRP, and are summarized below.

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<sup>1</sup> Starting in the 2013.Q4 Compliance filing, wind and solar 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.

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 **June 2017**.
- 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.
- Wyoming Central -> Wyoming Northeast transmission link included.

## IRP Partial Displacements (This Filing)

Provided in the table below are the QFs that have executed a PPA or are actively negotiating for a PPA. Signed resources are new and were not included in the 2017 IRP.

QF Queue						
No.	QF	Partial Displacement	Name plate	CF	Capacity Contribution	Start Date
1	Boswell Springs I Wind	12.64	80.00	40.7%	15.800%	2021 12 31
2	Boswell Springs II Wind	12.64	80.00	40.7%	15.800%	2021 12 31
3	Boswell Springs III Wind	12.64	80.00	40.7%	15.800%	2021 12 31
4	Boswell Springs IV Wind	12.64	80.00	40.7%	15.800%	2021 12 31
5	Glen Canyon A Solar QF	44.16	74.00	32.2%	59.700%	2019 09 29
6	Glen Canyon B Solar QF	12.53	21.00	34.9%	59.700%	2019 11 01
7	Sage I Solar QF	11.93	20.00	28.2%	59.700%	2019 10 01
8	Sage II Solar QF	11.93	20.00	28.2%	59.700%	2019 10 01
9	BYU-ID QF	4.20	5.60	79.0%	74.900%	2017 09 29
10	Sage III Solar QF	10.50	17.60	26.7%	59.700%	2019 10 01
11	Beatty Solar (Terminated)	-3.24	-5.00		64.800%	2016 12 01
Total Signed MW		142.57	473.20			

1	QF - 245 - WY - Wind	12.64	80.00	44.9%	15.800%	2018 11 01
2	QF - 246 - WY - Wind	12.64	80.00	42.0%	15.800%	2018 11 01
3	QF - 247 - WY - Wind	12.64	80.00	37.4%	15.800%	2018 11 01
4	QF - 249 - OR - Solar	25.92	40.00	29.1%	64.800%	2017 12 31
5	QF - 279 - OR - Solar	25.92	40.00	31.0%	64.800%	2018 06 30
6	QF - 280 - OR - Solar	25.92	40.00	27.9%	64.800%	2018 12 01
7	QF - 281 - OR - Solar	25.92	40.00	24.5%	64.800%	2018 12 01
8	QF - 254 - OR - Solar	35.64	55.00	24.6%	64.800%	2020 12 31
9	QF - 372 - WY - Solar	23.87	40.00	27.4%	59.700%	2019 06 30
10	QF - 380 - OR - Solar	32.40	50.00	25.8%	64.800%	2019 01 01
11	QF - 381 - OR - Solar	51.84	80.00	29.3%	64.800%	2021 01 01
12	QF - 397 - OR - Solar	12.96	20.00	29.3%	64.800%	2021 01 01
13	QF - 383 - OR - Solar	51.84	80.00	28.0%	64.800%	2019 12 01



14	QF - 384 - OR - Solar	51.84	80.00	28.0%	64.800%	2019 12 01
15	QF - 385 - OR - Solar	51.84	80.00	28.0%	64.800%	2019 12 01
16	QF - 388 - UT - Solar	61.35	80.00	27.8%	76.700%	2019 11 01
17	QF - 389 - WY - Wind	12.55	79.40	41.6%	15.800%	2019 01 01
18	QF - 390 - WY - Solar	11.93	20.00	26.9%	59.700%	2018 12 01
19	QF - 391 - WY - Solar	11.93	20.00	27.7%	59.700%	2018 12 01
20	QF - 394 - WY - Wind	12.64	80.00	52.1%	15.800%	2020 01 01
21	QF - 339 - WY - Wind	11.99	75.90	46.9%	15.800%	2019 01 01
22	QF - 304 - WY - Solar	17.90	30.00	27.4%	59.700%	2020 01 01
23	QF - 305 - WY - Solar	47.74	80.00	27.4%	59.700%	2020 01 01
24	QF - 292 - OR - Solar	25.92	40.00	28.3%	64.800%	2019 12 31
25	QF - 293 - OR - Solar	32.40	50.00	26.7%	64.800%	2019 12 31
26	QF - 396 - OR - Solar	18.53	28.60	28.9%	64.800%	2019 08 01
27	QF - 405 - OR - Solar	32.40	50.00	27.1%	64.800%	2019 12 01
28	QF - 406 - OR - Solar	51.84	80.00	27.1%	64.800%	2019 12 01
29	QF - 407 - OR - Solar	51.84	80.00	27.1%	64.800%	2019 12 01
30	QF - 408 - OR - Solar	51.84	80.00	26.7%	64.800%	2019 12 01
31	QF - 409 - OR - Solar	51.84	80.00	26.7%	64.800%	2019 12 01
32	QF - 410 - OR - Solar	51.84	80.00	26.7%	64.800%	2019 12 01
33	QF - 411 - OR - Solar	32.40	50.00	27.5%	64.800%	2019 12 01
34	QF - 418 - OR - Solar	34.99	54.00	22.7%	64.800%	2019 06 01
35	QF - 412 - WY - Wind	7.90	50.00	45.4%	15.800%	2018 12 01
36	QF - 426 - UT - Solar	15.16	40.00	23.6%	37.900%	2018 09 18
37	QF - 432 - WY - Solar	35.80	60.00	26.3%	59.7%	2018 12 01
38	QF - 432 - WY - Wind	7.61	55.00	27.3%	13.8%	2018 12 01
39	QF - 427 - WY - Wind	12.64	80.00	46.7%	15.800%	2019 09 01
40	QF - 413 - UT - Solar	58.02	80.00	27.7%	72.500%	2020 01 01
41	QF - 414 - OR - Solar	10.77	20.00	19.3%	53.900%	2018 11 01
42	QF - 415 - OR - Solar	19.39	36.00	20.3%	53.900%	2018 11 01
43	QF - 416 - OR - Solar	7.00	13.00	21.9%	53.800%	2018 11 01
44	QF - 417 - UT - Solar	20.89	35.00	29.0%	59.700%	2018 12 15
45	QF - 430 - WY - Wind	2.61	16.50	29.5%	15.800%	2018 07 01
46	QF - 419 - UT - Solar	44.75	75.00	30.6%	59.700%	2020 07 01
47	QF - 420 - WY - Solar	2.98	5.00	28.0%	59.600%	2018 06 01
48	QF - 421 - UT - Solar	11.93	20.00	31.6%	59.700%	2020 10 01
49	QF - 422 - UT - Solar	11.93	20.00	31.6%	59.700%	2020 10 01
50	QF - 423 - UT - Solar	11.93	20.00	31.6%	59.700%	2020 10 01
51	QF - 424 - UT - Solar	11.93	20.00	31.6%	59.700%	2020 10 01
52	QF - 425 - UT - Solar	47.74	80.00	31.6%	59.700%	2020 10 01
53	QF - 429 - WY - Solar	23.87	40.00	30.2%	59.700%	2020 01 01
54	QF - 428 - WY - Solar	23.87	40.00	30.2%	59.700%	2020 01 01
55	QF - 393 - OR - Solar	32.40	50.00	28.7%	64.800%	2018 12 01
56	QF - 433 - UT - Non firm	0.00	31.80	58.2%	0.000%	2018 01 01
57	QF - 434 - UT - Non firm	0.00	6.20	85.0%	0.000%	2018 01 01
58	QF - 435 - UT - Non firm	0.00	25.00	85.0%	0.000%	2018 01 01
59	QF - 308 - WY - Wind	12.64	80.00	46.6%	15.800%	2020 11 01
60	QF - 309 - WY - Wind	12.64	80.00	46.6%	15.800%	2020 11 01
61	QF - 310 - WY - Wind	12.64	80.00	46.6%	15.800%	2020 11 01
62	QF - 311 - WY - Wind	6.32	40.00	46.6%	15.800%	2020 11 01
63	QF - 313 - UT - Solar	47.74	80.00	29.6%	59.700%	2019 12 01
64	QF - 315 - UT - Solar	47.74	80.00	29.6%	59.700%	2019 12 01
65	QF - 317 - UT - Solar	47.74	80.00	29.6%	59.700%	2019 12 01
66	QF - 319 - UT - Solar	47.74	80.00	29.6%	59.700%	2019 12 01

67	QF - 321 - UT - Solar	47.74	80.00	29.6%	59.700%	2019 12 01
68	QF - 323 - UT - Solar	47.74	80.00	29.6%	59.700%	2019 12 01
69	QF - 325 - UT - Solar	47.74	80.00	29.6%	59.700%	2019 12 01
70	QF - 358 - UT - Solar	47.74	80.00	29.7%	59.700%	2019 12 01
71	QF - 359 - UT - Solar	47.74	80.00	29.7%	59.700%	2019 12 01
72	QF - 360 - UT - Solar	47.74	80.00	29.7%	59.700%	2019 12 01
73	QF - 361 - UT - Solar	47.74	80.00	29.7%	59.700%	2019 12 01
74	QF - 362 - UT - Solar	47.74	80.00	29.7%	59.700%	2019 12 01
75	QF - 363 - UT - Solar	47.74	80.00	29.7%	59.700%	2019 12 01
76	QF - 364 - UT - Solar	47.74	80.00	29.7%	59.700%	2019 12 01
77	QF - 431 - UT - Solar	47.74	80.00	29.6%	59.700%	2020 06 01
78	QF - 398 - OR - Solar	47.31	73.00	30.6%	64.800%	2021 01 01
79	QF - 399 - OR - Solar	47.31	73.00	30.6%	64.800%	2021 01 01
80	QF - 400 - OR - Solar	47.31	73.00	30.6%	64.800%	2021 01 01
81	QF - 401 - OR - Solar	47.31	73.00	30.6%	64.800%	2021 01 01
82	QF - 402 - OR - Solar	47.31	73.00	30.6%	64.800%	2021 01 01
83	QF - 403 - OR - Solar	47.31	73.00	30.6%	64.800%	2021 01 01
84	QF - 436 - WY - Solar	17.90	30.00	26.8%	59.700%	2020 01 01
85	QF - 437 - WY - Solar	47.74	80.00	29.0%	59.700%	2020 01 01
86	QF - 440 - OR - Solar	32.40	50.00	28.9%	64.800%	2019 06 01
87	QF - 328 - OR - Solar	29.81	46.00	28.7%	64.800%	2019 06 01
88	QF - 282 - WY - Solar	44.69	74.90	30.6%	59.700%	2019 03 01
89	QF - 337 - WY - Solar	7.95	13.33	26.7%	59.700%	2019 03 01
90	QF - 438 - OR - Solar	39.27	60.60	25.6%	64.800%	2020 11 01
91	QF - 439 - UT - Solar	34.61	58.00	31.6%	59.700%	2021 01 01
92	QF - 442 - WY - Solar	47.74	80.00	26.7%	59.700%	2020 01 01
Total Potential MW		2845.13	5352.23			
Total Partial Displacement		<b>2987.70</b>	<b>5825.43</b>			

The table below provides the partial displacement of the base case, adjusted for solar degradation. After accounting for the QF queue, the capacity displacement associated with the proxy avoided cost resources in this filing were as follows:

- Thermal: All 1,313 MW of thermal resources are displaced by the QF queue. The thermal proxy defers FOTs for entire term.
- Tracking Solar: 792 MW of solar resources are displaced by the QF queue. After degradation, the solar QF displaces 73 MW of Utah South tracking solar resources in 2035.
- Wind: 1031 MW of wind resources are displaced by the QF queue. The wind QF displaces 80 MW of Goshen wind resources in 2036.

Year	IRP Additions (Nameplate MW)				Displacement Adjusted for Capacity Contribution and Degradation				
	IRP Thermal	IRP Baseload Renewable	IRP Solar	IRP Wind	Thermal	Solar	Wind	FOT Summer	FOT Winter
2017	-	-	-	-	-	-	-	(3)	(3)
2018	-	-	-	-	-	-	-	193	193
2019	-	-	-	-	-	-	-	614	273
2020	-	-	-	-	-	-	-	807	307
2021	-	-	-	1,100	-	-	320	799	319
2022	-	-	-	1,100	-	-	320	916	308
2023	-	-	-	1,100	-	-	320	844	306
2024	-	-	-	1,100	-	-	320	885	287
2025	-	-	-	1,100	-	-	320	1,042	348
2026	-	-	-	1,100	-	-	320	978	351
2027	-	-	-	1,100	-	-	320	1,040	297
2028	-	-	11	1,100	-	11	320	1,575	413
2029	200	30	108	1,100	200	108	320	1,575	551
2030	636	30	108	1,100	636	108	320	1,566	516
2031	636	30	226	1,185	636	226	405	1,575	490
2032	636	30	463	1,185	636	463	405	1,575	451
2033	1,313	30	689	1,185	1,313	689	405	1,036	437
2034	1,313	30	737	1,185	1,313	737	405	1,003	477
2035	1,313	30	1,028	1,185	1,313	755	405	552	479
2036	1,313	30	1,040	1,959	1,313	755	1,031	188	188

## IRP Partial Displacements (Previous Filing)

Thermal partial displacement was 2,919.62 MW in the base case and 3,019.62 MW in the avoided cost case as shown in the table below, adjusted for solar degradation:

QF Queue						
No.	QF	Partial Displacement	Name plate	CF	Capacity Contribution	Start Date
1	Boswell Springs I Wind	12.64	80.00	40.7%	15.800%	2021 12 31
2	Boswell Springs II Wind	12.64	80.00	40.7%	15.800%	2021 12 31
3	Boswell Springs III Wind	12.64	80.00	40.7%	15.800%	2021 12 31
4	Boswell Springs IV Wind	12.64	80.00	40.7%	15.800%	2021 12 31
5	Glen Canyon A Solar QF	44.16	74.00	32.2%	59.700%	2019 09 29
6	Glen Canyon B Solar QF	12.53	21.00	34.9%	59.700%	2019 11 01
7	Sage I Solar QF	11.93	20.00	28.2%	59.700%	2019 10 01
8	Sage II Solar QF	11.93	20.00	28.2%	59.700%	2019 10 01
9	BYU-ID QF	4.20	5.60	79.0%	74.900%	2017 09 29
10	Sage III Solar QF	10.50	17.60	26.7%	59.700%	2019 10 01
11	Beatty Solar (Terminated)	-3.24	-5.00		64.800%	2016 12 01
Total Signed MW		142.57	473.20			

1	QF - 245 - WY - Wind	12.64	80.00	44.9%	15.800%	2018 11 01
2	QF - 246 - WY - Wind	12.64	80.00	42.0%	15.800%	2018 11 01
3	QF - 247 - WY - Wind	12.64	80.00	37.4%	15.800%	2018 11 01
4	QF - 249 - OR - Solar	25.92	40.00	29.1%	64.800%	2017 12 31
5	QF - 279 - OR - Solar	25.92	40.00	31.0%	64.800%	2018 06 30
6	QF - 280 - OR - Solar	25.92	40.00	27.9%	64.800%	2018 12 01
7	QF - 281 - OR - Solar	25.92	40.00	24.5%	64.800%	2018 12 01
8	QF - 336 - UT - Solar	34.61	58.00	33.9%	59.700%	2018 07 01
9	QF - 351 - OR - Solar	35.64	55.00	28.0%	64.800%	2019 01 01
10	QF - 254 - OR - Solar	35.64	55.00	24.6%	64.800%	2020 12 31
11	QF - 372 - WY - Solar	23.87	40.00	27.4%	59.700%	2019 06 30
12	QF - 380 - OR - Solar	32.40	50.00	25.8%	64.800%	2019 01 01
13	QF - 381 - OR - Solar	51.84	80.00	29.3%	64.800%	2021 01 01
14	QF - 397 - OR - Solar	12.96	20.00	29.3%	64.800%	2021 01 01
15	QF - 383 - OR - Solar	51.84	80.00	28.0%	64.800%	2019 12 01
16	QF - 384 - OR - Solar	51.84	80.00	28.0%	64.800%	2019 12 01
17	QF - 385 - OR - Solar	51.84	80.00	28.0%	64.800%	2019 12 01
18	QF - 388 - UT - Solar	61.35	80.00	27.8%	76.700%	2019 11 01
19	QF - 389 - WY - Wind	12.55	79.40	41.6%	15.800%	2019 01 01
20	QF - 390 - WY - Solar	11.93	20.00	26.9%	59.700%	2018 12 01
21	QF - 391 - WY - Solar	11.93	20.00	27.7%	59.700%	2018 12 01
22	QF - 337 - WY - Solar	7.95	13.33	26.7%	59.600%	2018 08 01
23	QF - 394 - WY - Wind	12.64	80.00	52.1%	15.800%	2020 01 01
24	QF - 365 - UT - Wind	12.64	80.00	31.4%	15.800%	2020 06 30
25	QF - 339 - WY - Wind	11.99	75.90	46.9%	15.800%	2019 01 01
26	QF - 304 - WY - Solar	17.90	30.00	27.4%	59.700%	2020 01 01
27	QF - 305 - WY - Solar	47.74	80.00	27.4%	59.700%	2020 01 01

28	QF - 292 - OR - Solar	25.92	40.00	28.3%	64.800%	2019 12 31
29	QF - 293 - OR - Solar	32.40	50.00	26.7%	64.800%	2019 12 31
30	QF - 396 - OR - Solar	18.53	28.60	28.9%	64.800%	2019 08 01
31	QF - 357 - UT - Solar	47.74	80.00	27.9%	59.700%	2020 09 01
32	QF - 405 - OR - Solar	32.40	50.00	27.1%	64.800%	2019 12 01
33	QF - 406 - OR - Solar	51.84	80.00	27.1%	64.800%	2019 12 01
34	QF - 407 - OR - Solar	51.84	80.00	27.1%	64.800%	2019 12 01
35	QF - 408 - OR - Solar	51.84	80.00	26.7%	64.800%	2019 12 01
36	QF - 409 - OR - Solar	51.84	80.00	26.7%	64.800%	2019 12 01
37	QF - 410 - OR - Solar	51.84	80.00	26.7%	64.800%	2019 12 01
38	QF - 411 - OR - Solar	32.40	50.00	27.5%	64.800%	2019 12 01
39	QF - 418 - OR - Solar	34.99	54.00	22.7%	64.800%	2019 06 01
40	QF - 412 - WY - Wind	7.90	50.00	45.4%	15.800%	2018 12 01
41	QF - 426 - UT - Solar	15.16	40.00	23.6%	37.900%	2018 09 18
42	QF - 432 - WY - Solar	35.80	60.00	26.3%	59.7%	2018 12 01
43	QF - 432 - WY - Wind	7.61	55.00	27.3%	13.8%	2018 12 01
44	QF - 427 - WY - Wind	12.64	80.00	46.7%	15.800%	2019 09 01
45	QF - 413 - UT - Solar	58.02	80.00	27.7%	72.500%	2020 01 01
46	QF - 414 - OR - Solar	10.77	20.00	19.3%	53.900%	2018 11 01
47	QF - 415 - OR - Solar	19.39	36.00	20.3%	53.900%	2018 11 01
48	QF - 416 - OR - Solar	7.00	13.00	21.9%	53.800%	2018 11 01
49	QF - 417 - UT - Solar	20.89	35.00	29.0%	59.700%	2018 12 15
50	QF - 430 - WY - Wind	2.61	16.50	29.5%	15.800%	2018 07 01
51	QF - 419 - UT - Solar	44.75	75.00	30.6%	59.700%	2020 07 01
52	QF - 420 - WY - Solar	2.98	5.00	28.0%	59.600%	2018 06 01
53	QF - 421 - UT - Solar	11.93	20.00	31.6%	59.700%	2020 10 01
54	QF - 422 - UT - Solar	11.93	20.00	31.6%	59.700%	2020 10 01
55	QF - 423 - UT - Solar	11.93	20.00	31.6%	59.700%	2020 10 01
56	QF - 424 - UT - Solar	11.93	20.00	31.6%	59.700%	2020 10 01
57	QF - 425 - UT - Solar	47.74	80.00	31.6%	59.700%	2020 10 01
58	QF - 429 - WY - Solar	23.87	40.00	30.2%	59.700%	2020 01 01
59	QF - 428 - WY - Solar	23.87	40.00	30.2%	59.700%	2020 01 01
60	QF - 393 - OR - Solar	32.40	50.00	28.7%	64.800%	2018 12 01
61	QF - 433 - UT - Non firm	0.00	31.80	58.2%	0.000%	2018 01 01
62	QF - 434 - UT - Non firm	0.00	6.20	85.0%	0.000%	2018 01 01
63	QF - 435 - UT - Non firm	0.00	25.00	85.0%	0.000%	2018 01 01
64	QF - 308 - WY - Wind	12.64	80.00	46.6%	15.800%	2020 11 01
65	QF - 309 - WY - Wind	12.64	80.00	46.6%	15.800%	2020 11 01
66	QF - 310 - WY - Wind	12.64	80.00	46.6%	15.800%	2020 11 01
67	QF - 311 - WY - Wind	6.32	40.00	46.6%	15.800%	2020 11 01
68	QF - 313 - UT - Solar	47.74	80.00	29.6%	59.700%	2019 12 01
69	QF - 315 - UT - Solar	47.74	80.00	29.6%	59.700%	2019 12 01
70	QF - 317 - UT - Solar	47.74	80.00	29.6%	59.700%	2019 12 01
71	QF - 319 - UT - Solar	47.74	80.00	29.6%	59.700%	2019 12 01
72	QF - 321 - UT - Solar	47.74	80.00	29.6%	59.700%	2019 12 01
73	QF - 323 - UT - Solar	47.74	80.00	29.6%	59.700%	2019 12 01
74	QF - 325 - UT - Solar	47.74	80.00	29.6%	59.700%	2019 12 01
75	QF - 358 - UT - Solar	47.74	80.00	29.7%	59.700%	2019 12 01
76	QF - 359 - UT - Solar	47.74	80.00	29.7%	59.700%	2019 12 01
77	QF - 360 - UT - Solar	47.74	80.00	29.7%	59.700%	2019 12 01
78	QF - 361 - UT - Solar	47.74	80.00	29.7%	59.700%	2019 12 01
79	QF - 362 - UT - Solar	47.74	80.00	29.7%	59.700%	2019 12 01
80	QF - 363 - UT - Solar	47.74	80.00	29.7%	59.700%	2019 12 01

81	QF - 364 - UT - Solar	47.74	80.00	29.7%	59.700%	2019 12 01
82	QF - 431 - UT - Solar	47.74	80.00	29.6%	59.700%	2020 06 01
83	QF - 398 - OR - Solar	47.31	73.00	30.6%	64.800%	2021 01 01
84	QF - 399 - OR - Solar	47.31	73.00	30.6%	64.800%	2021 01 01
85	QF - 400 - OR - Solar	47.31	73.00	30.6%	64.800%	2021 01 01
86	QF - 401 - OR - Solar	47.31	73.00	30.6%	64.800%	2021 01 01
87	QF - 402 - OR - Solar	47.31	73.00	30.6%	64.800%	2021 01 01
88	QF - 403 - OR - Solar	47.31	73.00	30.6%	64.800%	2021 01 01
89	QF - 436 - WY - Solar	17.90	30.00	26.8%	59.700%	2020 01 01
90	QF - 437 - WY - Solar	47.74	80.00	29.0%	59.700%	2020 01 01
91	QF - 328 - OR - Solar	29.81	46.00	28.7%	64.800%	2019 06 01
Total Potential MW		2777.05	5301.73			
Total Partial Displacement		<b>2919.62</b>	<b>5774.93</b>			

**ROCKY MOUNTAIN POWER**  
**DOCKET 03-035-14 AND DOCKET 17-035-37**  
**UPDATE IMPACT – UPDATED AVOIDED COST STUDY**  
**2017.Q3 - DECEMBER 2017**

**Appendix B.1**  
**Avoided Cost Prices \$/MWh**  
**Utah 2017.Q3 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 Difference	Solar Tracking Difference	Wind Difference
2018	\$20.69	\$20.46	\$19.01	(\$0.05)	\$0.07	(\$0.08)
2019	\$18.84	\$17.57	\$17.34	(\$1.89)	(\$1.95)	(\$1.80)
2020	\$16.93	\$11.99	\$15.75	(\$2.01)	(\$2.95)	(\$2.64)
2021	\$18.86	\$14.95	\$17.48	(\$0.35)	(\$0.07)	(\$0.54)
2022	\$19.91	\$16.98	\$18.44	(\$0.91)	(\$0.59)	(\$0.97)
2023	\$20.74	\$18.43	\$19.16	(\$1.01)	(\$0.05)	(\$1.34)
2024	\$24.26	\$21.19	\$22.36	\$1.88	\$2.31	\$1.36
2025	\$27.64	\$23.58	\$25.56	\$4.41	\$3.93	\$3.89
2026	\$27.39	\$24.04	\$24.99	\$2.79	\$3.37	\$2.32
2027	\$28.40	\$24.37	\$26.08	\$2.88	\$2.88	\$2.42
2028	\$30.41	\$25.22	\$28.57	\$2.72	\$1.71	\$2.92
2029	\$32.53	\$26.92	\$31.10	\$0.40	\$1.69	(\$0.15)
2030	\$34.99	\$28.27	\$33.79	(\$0.16)	\$0.89	(\$0.58)
2031	\$36.43	\$29.32	\$35.22	(\$0.49)	\$0.52	(\$0.94)
2032	\$37.70	\$30.12	\$36.50	(\$1.11)	\$0.22	(\$1.53)

15-Year Levelized Prices (Nominal) @ 6.570% Discount Rate (1) (3)

2018-2032	\$/MWh	\$24.66 (4)	\$20.87 (4)	\$23.041 (4)	\$0.30	\$0.50	\$0.005
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Footnotes:

- (2) Total Avoided Costs with Capacity, based on stated CF
- (3) 15-Years: 2018 - 2032
- (4) Levelized Monthly



**Table 1**  
**Avoided Cost Prices**  
**Utah 2017.Q3 - 100.0 MW and 85.0% CF**

Year	Capacity Price \$/kW-yr	Energy Only Price \$/MWh <sup>(2)</sup>	Total Price @ 85.0% Capacity Factor \$/MWh
2018	\$0.00	\$20.69	\$20.69
2019	\$0.00	\$18.84	\$18.84
2020	\$0.00	\$16.93	\$16.93
2021	\$0.00	\$18.86	\$18.86
2022	\$0.00	\$19.91	\$19.91
2023	\$0.00	\$20.74	\$20.74
2024	\$0.00	\$24.26	\$24.26
2025	\$0.00	\$27.64	\$27.64
2026	\$0.00	\$27.39	\$27.39
2027	\$0.00	\$28.40	\$28.40
2028	\$0.00	\$30.41	\$30.41
2029	\$0.00	\$32.53	\$32.53
2030	\$0.00	\$34.99	\$34.99
2031	\$0.00	\$36.43	\$36.43
2032	\$0.00	\$37.70	\$37.70
2033	\$0.00	\$40.59	\$40.59
2034	\$0.00	\$41.92	\$41.92
2035	\$0.00	\$45.02	\$45.02
2036	\$0.00	\$49.44	\$49.44

2018-2032	15-Year Levelized Prices (Nominal) @ 6.570% Discount Rate (1) (3)		
	\$/kW	\$0.00	
	\$/MWh		\$24.66 (3)
2020-2034	15 year Levelized Prices (Nominal) @ 6.57% Discount Rate (1) (3)		
	\$/kW	\$0.00	
	\$/MWh		\$27.14 (3)

Footnotes:

- (1) Discount Rate - 2017 IRP
- (2) 'Energy Only' is the GRID calculated costs and includes some capacity costs.
- (3) Levelized Monthly

**Table 2**  
**Avoided Energy Costs - Scheduled Hours (\$/MWh)**  
**Utah 2017.Q3 - 100.0 MW and 85.0% CF**

Year	Annual	Winter Season					Summer Season				Winter Season		
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Energy Only</b>													
2018	20.69	22.97	22.71	19.31	17.85	16.96	17.86	25.83	23.81	19.86	17.93	19.71	23.40
2019	18.84	20.29	19.72	19.44	16.69	16.68	15.10	22.34	22.04	18.73	17.16	18.30	19.43
2020	16.93	22.00	18.95	16.53	13.82	13.00	13.69	17.22	16.67	17.19	16.88	16.36	20.81
2021	18.86	21.33	20.33	18.03	15.75	15.92	15.43	18.14	20.12	20.11	19.29	19.03	22.85
2022	19.91	22.72	20.92	19.68	17.29	17.07	17.08	19.28	21.70	20.36	19.72	20.63	22.42
2023	20.74	20.56	21.81	20.50	16.98	17.42	17.18	20.34	22.53	21.36	20.36	24.59	25.23
2024	24.26	25.55	26.70	23.18	20.23	20.45	21.59	23.33	25.30	24.25	22.76	27.05	30.69
2025	27.64	29.51	29.77	25.81	24.50	23.18	25.58	28.33	28.40	29.02	28.44	27.90	31.36
2026	27.39	29.14	29.71	25.73	24.79	23.49	26.31	29.15	28.76	27.93	28.94	27.59	27.29
2027	28.40	29.90	30.00	26.13	25.69	23.89	26.86	30.61	29.29	29.69	30.06	29.23	29.53
2028	30.41	30.31	33.00	28.55	27.76	26.44	28.63	31.18	34.00	30.96	30.47	31.39	32.31
2029	32.53	32.47	32.48	31.22	30.01	28.60	30.14	34.61	38.01	35.39	32.72	31.65	32.99
2030	34.99	33.66	34.32	34.21	31.25	30.68	32.85	38.03	40.71	39.30	35.78	34.20	34.79
2031	36.43	35.98	36.58	34.18	32.79	32.73	33.69	40.27	42.39	41.24	36.30	34.05	36.78
2032	37.70	37.72	37.37	35.62	32.99	33.99	35.08	41.08	43.22	42.28	38.72	34.98	39.14
2033	40.59	39.63	42.13	37.05	36.31	35.37	37.43	45.67	46.01	45.11	40.75	38.44	43.20
2034	41.92	41.42	42.40	38.66	37.65	36.79	38.38	46.30	47.76	45.61	41.83	40.08	45.96
2035	45.02	44.66	44.08	40.72	38.49	37.32	35.90	65.17	52.83	46.42	43.12	42.86	48.00
2036	49.44	47.40	46.51	40.86	39.09	38.44	42.16	66.95	62.10	55.04	51.34	48.75	54.07

**Table 4**  
**Burnertip Natural Gas Price Forecast**  
**Utah 2017.Q3 - 100.0 MW and 85.0% CF**

Year	PacifiCorp		
	Delivered IRP - Utah Greenfield Fuel Cost	Delivered IRP West Side Fuel Cost	Delivered IRP - Wyo NE Fuel Cost
2016	\$2.32	\$2.29	\$2.35
2017	\$2.73	\$2.65	\$2.77
2018	\$2.67	\$2.50	\$2.66
2019	\$2.51	\$2.39	\$2.51
2020	\$2.47	\$2.38	\$2.45
2021	\$2.49	\$2.40	\$2.48
2022	\$2.51	\$2.42	\$2.50
2023	\$2.64	\$2.57	\$2.67
2024	\$3.34	\$3.30	\$3.37
2025	\$3.91	\$3.89	\$3.94
2026	\$3.91	\$3.88	\$3.94
2027	\$4.05	\$4.02	\$4.08
2028	\$4.24	\$4.20	\$4.27
2029	\$4.53	\$4.49	\$4.56
2030	\$4.83	\$4.78	\$4.86
2031	\$5.08	\$5.03	\$5.11
2032	\$5.25	\$5.19	\$5.28
2033	\$5.48	\$5.42	\$5.52
2034	\$5.71	\$5.65	\$5.74
2035	\$5.90	\$5.84	\$5.94
2036	\$6.25	\$6.19	\$6.29
2037	\$6.43	\$6.35	\$6.47
2038	\$6.71	\$6.62	\$6.75
2039	\$6.86	\$6.77	\$6.90
2040	\$7.03	\$6.95	\$7.08
2041	\$7.19	\$7.10	\$7.23
2042	\$4.91	\$4.86	\$4.94

**Table 5**  
**Utah 2017.Q3 - 100.0 MW and 85.0% CF**  
**January 2018 through December 2036**

**Nominal Avoided Costs Calculated Monthly**

15 year starting 2020	\$	194,890,532	\$	-	\$	194,890,532	7,182,064	\$27.14
<b>Nominal NPV at 6.57% Discount Rate</b>								
15 Year starting 2018	\$	177,075,637	\$	-	\$	177,075,637	7,181,378	\$24.66

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	85.0% CF	Dollars	MWH	85.0% CF
Jan-18	1,452,688	-	1,452,688	63,240	22.97
Feb-18	1,296,969	-	1,296,969	57,120	22.71
Mar-18	1,221,006	-	1,221,006	63,240	19.31
Apr-18	1,092,265	-	1,092,265	61,200	17.85
May-18	1,072,527	-	1,072,527	63,240	16.96
Jun-18	1,092,950	-	1,092,950	61,200	17.86
Jul-18	1,633,768	-	1,633,768	63,240	25.83
Aug-18	1,505,947	-	1,505,947	63,240	23.81
Sep-18	1,215,240	-	1,215,240	61,200	19.86
Oct-18	1,133,906	-	1,133,906	63,240	17.93
Nov-18	1,206,335	-	1,206,335	61,200	19.71
Dec-18	1,479,576	-	1,479,576	63,240	23.40
Jan-19	1,283,157	-	1,283,157	63,240	20.29
Feb-19	1,126,643	-	1,126,643	57,120	19.72
Mar-19	1,229,332	-	1,229,332	63,240	19.44
Apr-19	1,021,416	-	1,021,416	61,200	16.69
May-19	1,054,527	-	1,054,527	63,240	16.68
Jun-19	923,824	-	923,824	61,200	15.10
Jul-19	1,413,067	-	1,413,067	63,240	22.34
Aug-19	1,393,906	-	1,393,906	63,240	22.04
Sep-19	1,146,326	-	1,146,326	61,200	18.73
Oct-19	1,084,901	-	1,084,901	63,240	17.16
Nov-19	1,119,671	-	1,119,671	61,200	18.30
Dec-19	1,228,773	-	1,228,773	63,240	19.43
Jan-20	1,391,578	-	1,391,578	63,240	22.00
Feb-20	1,120,822	-	1,120,822	59,160	18.95
Mar-20	1,045,241	-	1,045,241	63,240	16.53
Apr-20	845,836	-	845,836	61,200	13.82
May-20	821,925	-	821,925	63,240	13.00
Jun-20	837,731	-	837,731	61,200	13.69
Jul-20	1,088,679	-	1,088,679	63,240	17.22
Aug-20	1,053,907	-	1,053,907	63,240	16.67
Sep-20	1,052,144	-	1,052,144	61,200	17.19
Oct-20	1,067,189	-	1,067,189	63,240	16.88
Nov-20	1,000,950	-	1,000,950	61,200	16.36
Dec-20	1,315,867	-	1,315,867	63,240	20.81
Jan-21	1,349,163	-	1,349,163	63,240	21.33
Feb-21	1,161,145	-	1,161,145	57,120	20.33
Mar-21	1,140,294	-	1,140,294	63,240	18.03
Apr-21	963,670	-	963,670	61,200	15.75
May-21	1,006,874	-	1,006,874	63,240	15.92
Jun-21	944,402	-	944,402	61,200	15.43
Jul-21	1,147,104	-	1,147,104	63,240	18.14
Aug-21	1,272,303	-	1,272,303	63,240	20.12
Sep-21	1,231,024	-	1,231,024	61,200	20.11
Oct-21	1,219,682	-	1,219,682	63,240	19.29
Nov-21	1,164,789	-	1,164,789	61,200	19.03
Dec-21	1,445,042	-	1,445,042	63,240	22.85
Jan-22	1,436,705	-	1,436,705	63,240	22.72
Feb-22	1,195,091	-	1,195,091	57,120	20.92
Mar-22	1,244,781	-	1,244,781	63,240	19.68

Apr-22	1,057,994	-	1,057,994	61,200	17.29
May-22	1,079,353	-	1,079,353	63,240	17.07
Jun-22	1,045,002	-	1,045,002	61,200	17.08
Jul-22	1,219,439	-	1,219,439	63,240	19.28
Aug-22	1,372,610	-	1,372,610	63,240	21.70
Sep-22	1,246,146	-	1,246,146	61,200	20.36
Oct-22	1,247,109	-	1,247,109	63,240	19.72
Nov-22	1,262,428	-	1,262,428	61,200	20.63
Dec-22	1,417,744	-	1,417,744	63,240	22.42
Jan-23	1,300,491	-	1,300,491	63,240	20.56
Feb-23	1,245,508	-	1,245,508	57,120	21.81
Mar-23	1,296,465	-	1,296,465	63,240	20.50
Apr-23	1,039,422	-	1,039,422	61,200	16.98
May-23	1,101,512	-	1,101,512	63,240	17.42
Jun-23	1,051,140	-	1,051,140	61,200	17.18
Jul-23	1,286,489	-	1,286,489	63,240	20.34
Aug-23	1,424,906	-	1,424,906	63,240	22.53
Sep-23	1,307,183	-	1,307,183	61,200	21.36
Oct-23	1,287,758	-	1,287,758	63,240	20.36
Nov-23	1,505,031	-	1,505,031	61,200	24.59
Dec-23	1,595,698	-	1,595,698	63,240	25.23
Jan-24	1,615,742	-	1,615,742	63,240	25.55
Feb-24	1,579,625	-	1,579,625	59,160	26.70
Mar-24	1,466,137	-	1,466,137	63,240	23.18
Apr-24	1,238,309	-	1,238,309	61,200	20.23
May-24	1,293,239	-	1,293,239	63,240	20.45
Jun-24	1,321,257	-	1,321,257	61,200	21.59
Jul-24	1,475,688	-	1,475,688	63,240	23.33
Aug-24	1,599,821	-	1,599,821	63,240	25.30
Sep-24	1,484,312	-	1,484,312	61,200	24.25
Oct-24	1,439,332	-	1,439,332	63,240	22.76
Nov-24	1,655,556	-	1,655,556	61,200	27.05
Dec-24	1,940,772	-	1,940,772	63,240	30.69
Jan-25	1,866,455	-	1,866,455	63,240	29.51
Feb-25	1,700,523	-	1,700,523	57,120	29.77
Mar-25	1,632,191	-	1,632,191	63,240	25.81
Apr-25	1,499,104	-	1,499,104	61,200	24.50
May-25	1,465,909	-	1,465,909	63,240	23.18
Jun-25	1,565,764	-	1,565,764	61,200	25.58
Jul-25	1,791,795	-	1,791,795	63,240	28.33
Aug-25	1,795,761	-	1,795,761	63,240	28.40
Sep-25	1,775,843	-	1,775,843	61,200	29.02
Oct-25	1,798,232	-	1,798,232	63,240	28.44
Nov-25	1,707,593	-	1,707,593	61,200	27.90
Dec-25	1,983,384	-	1,983,384	63,240	31.36
Jan-26	1,842,813	-	1,842,813	63,240	29.14
Feb-26	1,697,003	-	1,697,003	57,120	29.71
Mar-26	1,627,304	-	1,627,304	63,240	25.73
Apr-26	1,517,002	-	1,517,002	61,200	24.79
May-26	1,485,469	-	1,485,469	63,240	23.49
Jun-26	1,609,873	-	1,609,873	61,200	26.31
Jul-26	1,843,392	-	1,843,392	63,240	29.15
Aug-26	1,818,733	-	1,818,733	63,240	28.76
Sep-26	1,709,277	-	1,709,277	61,200	27.93
Oct-26	1,830,402	-	1,830,402	63,240	28.94
Nov-26	1,688,350	-	1,688,350	61,200	27.59
Dec-26	1,725,842	-	1,725,842	63,240	27.29
Jan-27	1,890,818	-	1,890,818	63,240	29.90
Feb-27	1,713,500	-	1,713,500	57,120	30.00
Mar-27	1,652,469	-	1,652,469	63,240	26.13
Apr-27	1,572,246	-	1,572,246	61,200	25.69
May-27	1,510,672	-	1,510,672	63,240	23.89

Jun-27	1,643,566	-	1,643,566	61,200	26.86
Jul-27	1,935,839	-	1,935,839	63,240	30.61
Aug-27	1,852,239	-	1,852,239	63,240	29.29
Sep-27	1,817,069	-	1,817,069	61,200	29.69
Oct-27	1,901,096	-	1,901,096	63,240	30.06
Nov-27	1,788,751	-	1,788,751	61,200	29.23
Dec-27	1,867,506	-	1,867,506	63,240	29.53
Jan-28	1,916,530	-	1,916,530	63,240	30.31
Feb-28	1,952,072	-	1,952,072	59,160	33.00
Mar-28	1,805,727	-	1,805,727	63,240	28.55
Apr-28	1,699,154	-	1,699,154	61,200	27.76
May-28	1,672,346	-	1,672,346	63,240	26.44
Jun-28	1,751,935	-	1,751,935	61,200	28.63
Jul-28	1,971,637	-	1,971,637	63,240	31.18
Aug-28	2,150,416	-	2,150,416	63,240	34.00
Sep-28	1,894,926	-	1,894,926	61,200	30.96
Oct-28	1,926,684	-	1,926,684	63,240	30.47
Nov-28	1,920,887	-	1,920,887	61,200	31.39
Dec-28	2,043,008	-	2,043,008	63,240	32.31
Jan-29	2,053,556	-	2,053,556	63,240	32.47
Feb-29	1,855,426	-	1,855,426	57,120	32.48
Mar-29	1,974,300	-	1,974,300	63,240	31.22
Apr-29	1,836,320	-	1,836,320	61,200	30.01
May-29	1,808,864	-	1,808,864	63,240	28.60
Jun-29	1,844,712	-	1,844,712	61,200	30.14
Jul-29	2,188,945	-	2,188,945	63,240	34.61
Aug-29	2,403,505	-	2,403,505	63,240	38.01
Sep-29	2,166,074	-	2,166,074	61,200	35.39
Oct-29	2,069,180	-	2,069,180	63,240	32.72
Nov-29	1,937,249	-	1,937,249	61,200	31.65
Dec-29	2,085,989	-	2,085,989	63,240	32.99
Jan-30	2,128,636	-	2,128,636	63,240	33.66
Feb-30	1,960,579	-	1,960,579	57,120	34.32
Mar-30	2,163,375	-	2,163,375	63,240	34.21
Apr-30	1,912,427	-	1,912,427	61,200	31.25
May-30	1,940,454	-	1,940,454	63,240	30.68
Jun-30	2,010,385	-	2,010,385	61,200	32.85
Jul-30	2,405,273	-	2,405,273	63,240	38.03
Aug-30	2,574,749	-	2,574,749	63,240	40.71
Sep-30	2,405,410	-	2,405,410	61,200	39.30
Oct-30	2,262,737	-	2,262,737	63,240	35.78
Nov-30	2,092,923	-	2,092,923	61,200	34.20
Dec-30	2,199,852	-	2,199,852	63,240	34.79
Jan-31	2,275,652	-	2,275,652	63,240	35.98
Feb-31	2,089,590	-	2,089,590	57,120	36.58
Mar-31	2,161,846	-	2,161,846	63,240	34.18
Apr-31	2,006,902	-	2,006,902	61,200	32.79
May-31	2,070,052	-	2,070,052	63,240	32.73
Jun-31	2,061,901	-	2,061,901	61,200	33.69
Jul-31	2,546,793	-	2,546,793	63,240	40.27
Aug-31	2,680,864	-	2,680,864	63,240	42.39
Sep-31	2,523,939	-	2,523,939	61,200	41.24
Oct-31	2,295,350	-	2,295,350	63,240	36.30
Nov-31	2,083,785	-	2,083,785	61,200	34.05
Dec-31	2,325,827	-	2,325,827	63,240	36.78
Jan-32	2,385,704	-	2,385,704	63,240	37.72
Feb-32	2,211,076	-	2,211,076	59,160	37.37
Mar-32	2,252,845	-	2,252,845	63,240	35.62
Apr-32	2,018,957	-	2,018,957	61,200	32.99
May-32	2,149,448	-	2,149,448	63,240	33.99
Jun-32	2,147,034	-	2,147,034	61,200	35.08
Jul-32	2,597,804	-	2,597,804	63,240	41.08

Aug-32	2,733,393	-	2,733,393	63,240	43.22
Sep-32	2,587,715	-	2,587,715	61,200	42.28
Oct-32	2,448,570	-	2,448,570	63,240	38.72
Nov-32	2,140,670	-	2,140,670	61,200	34.98
Dec-32	2,475,007	-	2,475,007	63,240	39.14
Jan-33	2,506,134	-	2,506,134	63,240	39.63
Feb-33	2,406,369	-	2,406,369	57,120	42.13
Mar-33	2,343,238	-	2,343,238	63,240	37.05
Apr-33	2,222,255	-	2,222,255	61,200	36.31
May-33	2,236,573	-	2,236,573	63,240	35.37
Jun-33	2,290,419	-	2,290,419	61,200	37.43
Jul-33	2,888,422	-	2,888,422	63,240	45.67
Aug-33	2,909,612	-	2,909,612	63,240	46.01
Sep-33	2,760,605	-	2,760,605	61,200	45.11
Oct-33	2,577,070	-	2,577,070	63,240	40.75
Nov-33	2,352,612	-	2,352,612	61,200	38.44
Dec-33	2,732,025	-	2,732,025	63,240	43.20
Jan-34	2,619,712	-	2,619,712	63,240	41.42
Feb-34	2,422,139	-	2,422,139	57,120	42.40
Mar-34	2,445,166	-	2,445,166	63,240	38.66
Apr-34	2,304,114	-	2,304,114	61,200	37.65
May-34	2,326,831	-	2,326,831	63,240	36.79
Jun-34	2,348,650	-	2,348,650	61,200	38.38
Jul-34	2,927,835	-	2,927,835	63,240	46.30
Aug-34	3,020,590	-	3,020,590	63,240	47.76
Sep-34	2,791,056	-	2,791,056	61,200	45.61
Oct-34	2,645,172	-	2,645,172	63,240	41.83
Nov-34	2,452,942	-	2,452,942	61,200	40.08
Dec-34	2,906,513	-	2,906,513	63,240	45.96
Jan-35	2,824,264	-	2,824,264	63,240	44.66
Feb-35	2,517,938	-	2,517,938	57,120	44.08
Mar-35	2,575,259	-	2,575,259	63,240	40.72
Apr-35	2,355,370	-	2,355,370	61,200	38.49
May-35	2,360,374	-	2,360,374	63,240	37.32
Jun-35	2,197,140	-	2,197,140	61,200	35.90
Jul-35	4,121,452	-	4,121,452	63,240	65.17
Aug-35	3,340,656	-	3,340,656	63,240	52.83
Sep-35	2,841,186	-	2,841,186	61,200	46.42
Oct-35	2,726,839	-	2,726,839	63,240	43.12
Nov-35	2,623,024	-	2,623,024	61,200	42.86
Dec-35	3,035,633	-	3,035,633	63,240	48.00
Jan-36	2,997,468	-	2,997,468	63,240	47.40
Feb-36	2,751,237	-	2,751,237	59,160	46.51
Mar-36	2,584,066	-	2,584,066	63,240	40.86
Apr-36	2,392,390	-	2,392,390	61,200	39.09
May-36	2,430,845	-	2,430,845	63,240	38.44
Jun-36	2,580,218	-	2,580,218	61,200	42.16
Jul-36	4,234,020	-	4,234,020	63,240	66.95
Aug-36	3,927,441	-	3,927,441	63,240	62.10
Sep-36	3,368,406	-	3,368,406	61,200	55.04
Oct-36	3,246,972	-	3,246,972	63,240	51.34
Nov-36	2,983,728	-	2,983,728	61,200	48.75
Dec-36	3,419,148	-	3,419,148	63,240	54.07




## Appendix B.2

### Avoided Cost Prices \$/MWh Utah 2017.Q3 Sch 38

Year	Utah 2017.Q3 Sch 38 Solar 31.1% CF (2)	Utah 2017.Q2 Sch 38 Solar 31.1% CF (2)	Difference
2018	\$20.46	\$20.39	\$0.07
2019	\$17.57	\$19.52	(\$1.95)
2020	\$11.99	\$14.94	(\$2.95)
2021	\$14.95	\$15.02	(\$0.07)
2022	\$16.98	\$17.57	(\$0.59)
2023	\$18.43	\$18.49	(\$0.05)
2024	\$21.19	\$18.87	\$2.31
2025	\$23.58	\$19.65	\$3.93
2026	\$24.04	\$20.67	\$3.37
2027	\$24.37	\$21.49	\$2.88
2028	\$25.22	\$23.51	\$1.71
2029	\$26.92	\$25.23	\$1.69
2030	\$28.27	\$27.38	\$0.89
2031	\$29.32	\$28.81	\$0.52
2032	\$30.12	\$29.89	\$0.22

2018-2032      15-Year Levelized Prices (Nominal) @ 6.570% Discount Rate (1) (3)  
                   \$/MWh            \$20.87 (4)            \$20.37 (4)            \$0.50

Footnotes:

- (2) Total Avoided Costs with Capacity, based on stated CF
- (3) 15-Years: 2018 - 2032
- (4) Levelized Monthly

**Table 1**  
**Avoided Cost Prices**  
**Utah 2017.Q3 Sch 38 Solar - 80.0 MW and 31.1% CF**

Year	Capacity Price \$/kW-yr	Energy Only Price \$/MWh <sup>(2)</sup>	Total Price @ 31.1% Capacity Factor \$/MWh
2018	\$0.00	\$20.46	\$20.46
2019	\$0.00	\$17.57	\$17.57
2020	\$0.00	\$11.99	\$11.99
2021	\$0.00	\$14.95	\$14.95
2022	\$0.00	\$16.98	\$16.98
2023	\$0.00	\$18.43	\$18.43
2024	\$0.00	\$21.19	\$21.19
2025	\$0.00	\$23.58	\$23.58
2026	\$0.00	\$24.04	\$24.04
2027	\$0.00	\$24.37	\$24.37
2028	\$0.00	\$25.22	\$25.22
2029	\$0.00	\$26.92	\$26.92
2030	\$0.00	\$28.27	\$28.27
2031	\$0.00	\$29.32	\$29.32
2032	\$0.00	\$30.12	\$30.12
2033	\$0.00	\$31.65	\$31.65
2034	\$0.00	\$32.13	\$32.13
2035	\$214.25	\$0.26	\$86.01
2036	\$218.97	\$0.31	\$88.21

2018-2032	15-Year Levelized Prices (Nominal) @ 6.570% Discount Rate (1) (3)		
	\$/kW	\$0.00	
	\$/MWh		\$20.87 (3)
2020-2034	15 year Levelized Prices (Nominal) @ 6.57% Discount Rate (1) (3)		
	\$/kW	\$0.00	
	\$/MWh		\$22.19 (3)

Footnotes:

- (1) Discount Rate - 2017 IRP
- (2) 'Energy Only' is the GRID calculated costs and includes some capacity costs.
- (3) Levelized Monthly

**Table 2**  
**Avoided Energy Costs - Scheduled Hours (\$/MWh)**  
**Utah 2017.Q2 - 100.0 MW and 85.0% CF**

Year	Annual	Winter Season					Summer Season				Winter Season		
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Energy Only</b>													
2018	20.46	22.74	22.32	19.46	17.51	16.03	17.19	29.82	24.18	18.77	17.21	18.50	24.07
2019	17.57	19.04	18.19	19.02	16.03	16.20	14.14	22.49	20.71	16.66	16.10	16.70	14.09
2020	11.99	15.86	10.72	13.63	11.85	9.98	10.28	12.51	12.40	13.92	10.85	10.39	13.99
2021	14.95	12.85	15.20	14.86	13.29	14.48	13.05	13.87	17.85	18.40	16.70	12.87	14.55
2022	16.98	17.81	17.96	17.03	15.21	15.04	14.57	16.91	20.08	19.99	18.78	17.52	12.05
2023	18.43	18.64	19.09	17.78	16.29	16.62	16.36	18.12	21.32	22.00	19.61	17.83	18.23
2024	21.19	19.16	21.13	19.90	17.93	19.13	19.86	21.54	24.94	26.24	22.75	19.27	20.39
2025	23.58	20.75	21.61	21.87	21.75	21.91	24.05	23.46	27.42	29.86	23.62	19.56	21.17
2026	24.04	20.32	22.64	21.85	22.07	22.20	24.77	24.67	27.69	30.51	24.48	19.36	20.91
2027	24.37	20.84	22.85	22.39	22.12	22.56	25.20	24.01	28.60	30.35	25.48	20.75	20.84
2028	25.22	22.01	24.13	23.11	23.39	23.87	25.56	24.90	29.27	31.16	25.81	21.32	21.94
2029	26.92	23.94	26.34	25.32	24.67	25.39	25.94	26.57	30.23	33.45	29.63	23.28	23.41
2030	28.27	25.20	27.82	26.97	26.40	26.45	27.44	28.04	31.03	35.00	29.71	25.51	25.39
2031	29.32	26.97	27.88	27.26	27.10	27.40	29.22	30.34	30.72	35.79	31.08	27.37	26.72
2032	30.12	27.75	28.47	28.61	27.67	28.03	32.20	30.30	31.37	35.96	31.27	27.58	27.24
2033	31.65	28.73	29.80	30.00	29.63	29.76	32.67	34.06	32.65	36.49	33.07	27.77	29.79
2034	32.13	29.96	30.83	30.63	29.92	30.56	32.85	33.56	33.85	35.73	32.91	27.73	34.31
2035	0.26	0.27	0.24	0.25	0.22	0.22	0.22	0.35	0.31	0.25	0.25	0.24	0.29
2036	0.31	0.31	0.26	0.25	0.22	0.23	0.26	0.40	0.43	0.36	0.31	0.31	0.35

**Table 3**  
**2017 IRP Utah Solar Resource**  
**31% Capacity Factor**

Year	Estimated Capital Cost \$/kW (a)	Capital Cost at Real Levelized Rate \$/kW-yr (b)	Fixed O&M \$/kW-yr (c)	Fixed Costs \$/MWh (d)	Variable O&M \$/MWh (e)	Tax Credit \$/MWh (f)	Total Resource Costs \$/MWh (g)	Total Resource Costs \$/kW-yr (h)	Wind Integration Cost \$/MWh (h)
2016	\$1,822	\$140.61	\$19.69	\$58.84	\$0.00	(\$2.45)	\$56.40	\$153.64	\$0.60
2017		\$143.28	\$20.07	\$59.96	\$0.00	(\$2.49)	\$57.47	\$156.57	\$0.61
2018		\$145.86	\$20.43	\$61.04	\$0.00	(\$2.53)	\$58.51	\$159.40	\$0.62
2019		\$149.21	\$20.90	\$62.44	\$0.00	(\$2.59)	\$59.85	\$163.05	\$0.63
2020		\$153.09	\$21.44	\$64.06	\$0.00	(\$2.66)	\$61.40	\$167.28	\$0.65
2021		\$156.76	\$21.95	\$65.60	\$0.00	(\$2.72)	\$62.88	\$171.30	\$0.67
2022		\$160.37	\$22.45	\$67.11	\$0.00	(\$2.78)	\$64.33	\$175.25	\$0.69
2023		\$164.06	\$22.97	\$68.65	\$0.00	(\$2.84)	\$65.81	\$179.29	\$0.71
2024		\$167.83	\$23.50	\$70.23	\$0.00	(\$2.91)	\$67.32	\$183.40	\$0.73
2025		\$171.69	\$24.04	\$71.84	\$0.00	(\$2.98)	\$68.86	\$187.61	\$0.75
2026		\$175.47	\$24.57	\$73.43	\$0.00	(\$3.05)	\$70.38	\$191.73	\$0.77
2027		\$179.33	\$25.11	\$75.04	\$0.00	(\$3.12)	\$71.92	\$195.94	\$0.79
2028		\$183.28	\$25.66	\$76.69	\$0.00	(\$3.19)	\$73.50	\$200.25	\$0.81
2029		\$187.31	\$26.22	\$78.38	\$0.00	(\$3.26)	\$75.12	\$204.65	\$0.83
2030		\$191.43	\$26.80	\$80.10	\$0.00	(\$3.33)	\$76.77	\$209.16	\$0.85
2031		\$195.64	\$27.39	\$81.87	\$0.00	(\$3.40)	\$78.47	\$213.77	\$0.87
2032		\$199.94	\$27.99	\$83.66	\$0.00	(\$3.47)	\$80.19	\$218.48	\$0.89
2033		\$204.34	\$28.61	\$85.51	\$0.00	(\$3.55)	\$81.96	\$223.28	\$0.91
2034		\$208.84	\$29.24	\$87.39	\$0.00	(\$3.63)	\$83.76	\$228.19	\$0.93
2035		\$213.43	\$29.88	\$89.31	\$0.00	(\$3.71)	\$85.60	\$233.20	\$0.95
2036		\$218.13	\$30.54	\$91.28	\$0.00	(\$3.79)	\$87.49	\$238.34	\$0.97
2037		\$222.93	\$31.21	\$93.28	\$0.00	(\$3.87)	\$89.41	\$243.60	\$0.99
2038		\$227.83	\$31.90	\$95.34	\$0.00	(\$3.96)	\$91.38	\$248.94	\$1.01
2039		\$232.84	\$32.60	\$97.43	\$0.00	(\$4.05)	\$93.38	\$254.41	\$1.03
2040		\$237.96	\$33.32	\$99.58	\$0.00	(\$4.14)	\$95.44	\$260.00	\$1.05
2041		\$243.20	\$34.05	\$101.77	\$0.00	(\$4.23)	\$97.54	\$265.73	\$1.07
2042		\$248.55	\$34.80	\$104.01	\$0.00	(\$4.32)	\$99.69	\$271.58	\$1.09

**Sources, Inputs and Assumptions**

Source:	(c)(f)	Plant Costs - 2017 IRP - Table 6.1 & 6.2	
	(a)	Plant capacity cost	
	(b)	= (a) x 0.0771567801772526	
	(d)	= ((b) + (c)) / (8.76 x 31.1%)	
	(g)	= (d) + (f)	
	(h)	Plant Costs - 2017 IRP - Table 6.1 & 6.2	

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

2016 \$	\$1,822	Plant capacity cost	\$/kW-yr
2016 \$	\$19.69	Fixed O&M, plus on-going capital cost	\$/kW-yr
2016 \$	0.60	Integration Cost	\$/MWh
2016 \$	\$0.00	Variable O&M	\$/MWh
2016 \$	(2.45)	Tax Credit	\$/MWh
	7.716%	Payment Factor	
	31.1%	Capacity Factor	

Company Official Inflation Forecast Dated September 29, 2017					
2017	1.9%	2026	2.2%	2035	2.2%
2018	1.8%	2027	2.2%	2036	2.2%
2019	2.3%	2028	2.2%	2037	2.2%
2020	2.6%	2029	2.2%	2038	2.2%
2021	2.4%	2030	2.2%	2039	2.2%
2022	2.3%	2031	2.2%	2040	2.2%
2023	2.3%	2032	2.2%	2041	2.2%
2024	2.3%	2033	2.2%	2042	2.2%

**Table 4**  
**Burnertip Natural Gas Price Forecast**  
**Utah 2017.Q3 Sch 38 Solar - 80.0 MW and 31.1% CF**

Year	PacifiCorp		
	Delivered IRP - Utah Greenfield Fuel Cost	Delivered IRP West Side Fuel Cost	Delivered IRP - Wyo NE Fuel Cost
2016	\$2.32	\$2.29	\$2.35
2017	\$2.73	\$2.65	\$2.77
2018	\$2.67	\$2.50	\$2.66
2019	\$2.51	\$2.39	\$2.51
2020	\$2.47	\$2.38	\$2.45
2021	\$2.49	\$2.40	\$2.48
2022	\$2.51	\$2.42	\$2.50
2023	\$2.64	\$2.57	\$2.67
2024	\$3.34	\$3.30	\$3.37
2025	\$3.91	\$3.89	\$3.94
2026	\$3.91	\$3.88	\$3.94
2027	\$4.05	\$4.02	\$4.08
2028	\$4.24	\$4.20	\$4.27
2029	\$4.53	\$4.49	\$4.56
2030	\$4.83	\$4.78	\$4.86
2031	\$5.08	\$5.03	\$5.11
2032	\$5.25	\$5.19	\$5.28
2033	\$5.48	\$5.42	\$5.52
2034	\$5.71	\$5.65	\$5.74
2035	\$5.90	\$5.84	\$5.94
2036	\$6.25	\$6.19	\$6.29
2037	\$6.43	\$6.35	\$6.47
2038	\$6.71	\$6.62	\$6.75
2039	\$6.86	\$6.77	\$6.90
2040	\$7.03	\$6.95	\$7.08
2041	\$7.19	\$7.10	\$7.23
2042	\$4.91	\$4.86	\$4.94

**Table 5**  
**Utah 2017.Q3 Sch 38 Solar - 80.0 MW and 31.1% CF**  
**January 2018 through December 2036**  
**Nominal Avoided Costs Calculated Monthly**

15 year starting 2020	\$	44,815,951	\$	-	\$	44,815,951	2,019,918	\$22.19
<b>Nominal NPV at 6.57% Discount Rate</b>								
15 Year starting 2018	\$	42,586,331	\$	-	\$	42,586,331	2,040,121	\$20.87

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	30.7% CF	Dollars	MWH	30.7% CF
Jan-18	239,549	-	239,549	10,534	22.74
Feb-18	263,084	-	263,084	11,789	22.32
Mar-18	357,232	-	357,232	18,361	19.46
Apr-18	371,297	-	371,297	21,207	17.51
May-18	393,553	-	393,553	24,549	16.03
Jun-18	448,300	-	448,300	26,080	17.19
Jul-18	704,025	-	704,025	23,606	29.82
Aug-18	571,638	-	571,638	23,644	24.18
Sep-18	391,313	-	391,313	20,842	18.77
Oct-18	290,757	-	290,757	16,897	17.21
Nov-18	210,521	-	210,521	11,381	18.50
Dec-18	211,321	-	211,321	8,780	24.07
Jan-19	199,588	-	199,588	10,481	19.04
Feb-19	213,350	-	213,350	11,730	18.19
Mar-19	347,514	-	347,514	18,269	19.02
Apr-19	338,335	-	338,335	21,101	16.03
May-19	395,678	-	395,678	24,426	16.20
Jun-19	366,902	-	366,902	25,950	14.14
Jul-19	528,157	-	528,157	23,488	22.49
Aug-19	487,268	-	487,268	23,526	20.71
Sep-19	345,471	-	345,471	20,738	16.66
Oct-19	270,689	-	270,689	16,813	16.10
Nov-19	189,154	-	189,154	11,324	16.70
Dec-19	123,109	-	123,109	8,736	14.09
Jan-20	165,387	-	165,387	10,429	15.86
Feb-20	129,571	-	129,571	12,089	10.72
Mar-20	247,756	-	247,756	18,178	13.63
Apr-20	248,815	-	248,815	20,996	11.85
May-20	242,565	-	242,565	24,304	9.98
Jun-20	265,471	-	265,471	25,820	10.28
Jul-20	292,374	-	292,374	23,371	12.51
Aug-20	290,208	-	290,208	23,409	12.40
Sep-20	287,136	-	287,136	20,634	13.92
Oct-20	181,474	-	181,474	16,729	10.85
Nov-20	117,114	-	117,114	11,268	10.39
Dec-20	121,648	-	121,648	8,693	13.99
Jan-21	133,352	-	133,352	10,377	12.85
Feb-21	176,577	-	176,577	11,614	15.20
Mar-21	268,812	-	268,812	18,087	14.86
Apr-21	277,549	-	277,549	20,891	13.29
May-21	350,274	-	350,274	24,183	14.48
Jun-21	335,314	-	335,314	25,691	13.05
Jul-21	322,497	-	322,497	23,254	13.87
Aug-21	415,665	-	415,665	23,292	17.85
Sep-21	377,726	-	377,726	20,531	18.40
Oct-21	277,952	-	277,952	16,645	16.70
Nov-21	144,319	-	144,319	11,211	12.87
Dec-21	125,882	-	125,882	8,649	14.55
Jan-22	183,932	-	183,932	10,325	17.81
Feb-22	207,591	-	207,591	11,555	17.96
Mar-22	306,469	-	306,469	17,997	17.03

Apr-22	316,058	-	316,058	20,786	15.21
May-22	361,884	-	361,884	24,062	15.04
Jun-22	372,322	-	372,322	25,563	14.57
Jul-22	391,201	-	391,201	23,137	16.91
Aug-22	465,298	-	465,298	23,175	20.08
Sep-22	408,443	-	408,443	20,429	19.99
Oct-22	311,102	-	311,102	16,562	18.78
Nov-22	195,410	-	195,410	11,155	17.52
Dec-22	103,682	-	103,682	8,606	12.05
Jan-23	191,504	-	191,504	10,273	18.64
Feb-23	219,447	-	219,447	11,498	19.09
Mar-23	318,342	-	318,342	17,907	17.78
Apr-23	336,891	-	336,891	20,682	16.29
May-23	397,899	-	397,899	23,941	16.62
Jun-23	416,166	-	416,166	25,435	16.36
Jul-23	417,095	-	417,095	23,022	18.12
Aug-23	491,612	-	491,612	23,059	21.32
Sep-23	447,276	-	447,276	20,327	22.00
Oct-23	323,086	-	323,086	16,479	19.61
Nov-23	197,885	-	197,885	11,099	17.83
Dec-23	156,062	-	156,062	8,563	18.23
Jan-24	195,876	-	195,876	10,222	19.16
Feb-24	250,341	-	250,341	11,849	21.13
Mar-24	354,581	-	354,581	17,817	19.90
Apr-24	369,080	-	369,080	20,579	17.93
May-24	455,601	-	455,601	23,822	19.13
Jun-24	502,498	-	502,498	25,308	19.86
Jul-24	493,351	-	493,351	22,907	21.54
Aug-24	572,320	-	572,320	22,944	24.94
Sep-24	530,789	-	530,789	20,225	26.24
Oct-24	372,959	-	372,959	16,397	22.75
Nov-24	212,778	-	212,778	11,044	19.27
Dec-24	173,711	-	173,711	8,520	20.39
Jan-25	211,004	-	211,004	10,171	20.75
Feb-25	246,011	-	246,011	11,383	21.61
Mar-25	387,713	-	387,713	17,728	21.87
Apr-25	445,388	-	445,388	20,476	21.75
May-25	519,272	-	519,272	23,703	21.91
Jun-25	605,732	-	605,732	25,181	24.05
Jul-25	534,722	-	534,722	22,792	23.46
Aug-25	625,983	-	625,983	22,829	27.42
Sep-25	600,871	-	600,871	20,124	29.86
Oct-25	385,368	-	385,368	16,315	23.62
Nov-25	214,913	-	214,913	10,989	19.56
Dec-25	179,440	-	179,440	8,477	21.17
Jan-26	205,676	-	205,676	10,120	20.32
Feb-26	256,414	-	256,414	11,326	22.64
Mar-26	385,418	-	385,418	17,639	21.85
Apr-26	449,606	-	449,606	20,374	22.07
May-26	523,555	-	523,555	23,584	22.20
Jun-26	620,583	-	620,583	25,055	24.77
Jul-26	559,477	-	559,477	22,678	24.67
Aug-26	628,989	-	628,989	22,715	27.69
Sep-26	610,933	-	610,933	20,023	30.51
Oct-26	397,438	-	397,438	16,233	24.48
Nov-26	211,689	-	211,689	10,934	19.36
Dec-26	176,390	-	176,390	8,435	20.91
Jan-27	209,836	-	209,836	10,069	20.84
Feb-27	257,463	-	257,463	11,269	22.85
Mar-27	393,029	-	393,029	17,551	22.39
Apr-27	448,324	-	448,324	20,272	22.12
May-27	529,454	-	529,454	23,466	22.56

Jun-27	628,137	-	628,137	24,930	25.20
Jul-27	541,734	-	541,734	22,565	24.01
Aug-27	646,513	-	646,513	22,602	28.60
Sep-27	604,640	-	604,640	19,923	30.35
Oct-27	411,494	-	411,494	16,152	25.48
Nov-27	225,729	-	225,729	10,879	20.75
Dec-27	174,944	-	174,944	8,393	20.84
Jan-28	220,501	-	220,501	10,019	22.01
Feb-28	280,279	-	280,279	11,614	24.13
Mar-28	403,500	-	403,500	17,463	23.11
Apr-28	471,732	-	471,732	20,170	23.39
May-28	557,277	-	557,277	23,349	23.87
Jun-28	633,904	-	633,904	24,805	25.56
Jul-28	559,139	-	559,139	22,452	24.90
Aug-28	658,180	-	658,180	22,489	29.27
Sep-28	617,671	-	617,671	19,823	31.16
Oct-28	414,806	-	414,806	16,071	25.81
Nov-28	230,754	-	230,754	10,825	21.32
Dec-28	183,178	-	183,178	8,351	21.94
Jan-29	238,687	-	238,687	9,969	23.94
Feb-29	293,828	-	293,828	11,157	26.34
Mar-29	439,895	-	439,895	17,376	25.32
Apr-29	495,199	-	495,199	20,069	24.67
May-29	589,828	-	589,828	23,232	25.39
Jun-29	640,242	-	640,242	24,681	25.94
Jul-29	593,568	-	593,568	22,340	26.57
Aug-29	676,325	-	676,325	22,376	30.23
Sep-29	659,771	-	659,771	19,724	33.45
Oct-29	473,750	-	473,750	15,991	29.63
Nov-29	250,712	-	250,712	10,771	23.28
Dec-29	194,516	-	194,516	8,309	23.41
Jan-30	249,970	-	249,970	9,919	25.20
Feb-30	308,879	-	308,879	11,101	27.82
Mar-30	466,344	-	466,344	17,289	26.97
Apr-30	527,090	-	527,090	19,969	26.40
May-30	611,302	-	611,302	23,116	26.45
Jun-30	673,872	-	673,872	24,558	27.44
Jul-30	623,330	-	623,330	22,228	28.04
Aug-30	690,788	-	690,788	22,264	31.03
Sep-30	686,837	-	686,837	19,626	35.00
Oct-30	472,637	-	472,637	15,911	29.71
Nov-30	273,363	-	273,363	10,717	25.51
Dec-30	209,914	-	209,914	8,268	25.39
Jan-31	266,175	-	266,175	9,869	26.97
Feb-31	307,986	-	307,986	11,046	27.88
Mar-31	468,987	-	468,987	17,203	27.26
Apr-31	538,525	-	538,525	19,869	27.10
May-31	630,242	-	630,242	23,000	27.40
Jun-31	714,111	-	714,111	24,435	29.22
Jul-31	671,025	-	671,025	22,117	30.34
Aug-31	680,457	-	680,457	22,153	30.72
Sep-31	698,972	-	698,972	19,528	35.79
Oct-31	491,974	-	491,974	15,831	31.08
Nov-31	291,850	-	291,850	10,663	27.37
Dec-31	219,773	-	219,773	8,226	26.72
Jan-32	272,542	-	272,542	9,820	27.75
Feb-32	324,024	-	324,024	11,383	28.47
Mar-32	489,662	-	489,662	17,117	28.61
Apr-32	547,072	-	547,072	19,770	27.67
May-32	641,496	-	641,496	22,885	28.03
Jun-32	782,948	-	782,948	24,313	32.20
Jul-32	666,901	-	666,901	22,006	30.30



Aug-32	691,443	-	691,443	22,042	31.37
Sep-32	698,683	-	698,683	19,430	35.96
Oct-32	492,613	-	492,613	15,752	31.27
Nov-32	292,567	-	292,567	10,610	27.58
Dec-32	222,928	-	222,928	8,185	27.24
Jan-33	280,724	-	280,724	9,771	28.73
Feb-33	325,893	-	325,893	10,936	29.80
Mar-33	510,949	-	510,949	17,031	30.00
Apr-33	582,851	-	582,851	19,671	29.63
May-33	677,590	-	677,590	22,771	29.76
Jun-33	790,366	-	790,366	24,191	32.67
Jul-33	745,738	-	745,738	21,896	34.06
Aug-33	716,163	-	716,163	21,932	32.65
Sep-33	705,373	-	705,373	19,333	36.49
Oct-33	518,344	-	518,344	15,674	33.07
Nov-33	293,181	-	293,181	10,557	27.77
Dec-33	242,623	-	242,623	8,144	29.79
Jan-34	291,253	-	291,253	9,722	29.96
Feb-34	335,501	-	335,501	10,881	30.83
Mar-34	519,137	-	519,137	16,946	30.63
Apr-34	585,669	-	585,669	19,573	29.92
May-34	692,485	-	692,485	22,657	30.56
Jun-34	790,654	-	790,654	24,070	32.85
Jul-34	731,218	-	731,218	21,787	33.56
Aug-34	738,718	-	738,718	21,822	33.85
Sep-34	687,234	-	687,234	19,236	35.73
Oct-34	513,182	-	513,182	15,595	32.91
Nov-34	291,264	-	291,264	10,504	27.73
Dec-34	278,007	-	278,007	8,103	34.31
Jan-35	2,612	1,428,337	1,430,949	9,674	147.92
Feb-35	2,574	1,428,337	1,430,911	10,826	132.17
Mar-35	4,136	1,428,337	1,432,472	16,861	84.96
Apr-35	4,320	1,428,337	1,432,657	19,475	73.56
May-35	5,034	1,428,337	1,433,371	22,544	63.58
Jun-35	5,242	1,428,337	1,433,579	23,950	59.86
Jul-35	7,500	1,428,337	1,435,837	21,678	66.24
Aug-35	6,822	1,428,337	1,435,159	21,713	66.10
Sep-35	4,728	1,428,337	1,433,065	19,140	74.87
Oct-35	3,945	1,428,337	1,432,281	15,517	92.30
Nov-35	2,551	1,428,337	1,430,888	10,451	136.91
Dec-35	2,299	1,428,337	1,430,636	8,063	177.43
Jan-36	2,955	1,459,819	1,462,774	9,625	151.97
Feb-36	2,941	1,459,819	1,462,761	11,157	131.11
Mar-36	4,185	1,459,819	1,464,004	16,777	87.26
Apr-36	4,357	1,459,819	1,464,176	19,377	75.56
May-36	5,205	1,459,819	1,465,024	22,431	65.31
Jun-36	6,251	1,459,819	1,466,070	23,830	61.52
Jul-36	8,576	1,459,819	1,468,395	21,569	68.08
Aug-36	9,194	1,459,819	1,469,013	21,605	68.00
Sep-36	6,845	1,459,819	1,466,664	19,044	77.01
Oct-36	4,778	1,459,819	1,464,597	15,440	94.86
Nov-36	3,231	1,459,819	1,463,050	10,399	140.69
Dec-36	2,818	1,459,819	1,462,637	8,023	182.31


### Appendix B.3

#### Avoided Cost Prices \$/MWh Utah 2017.Q3 Sch 38

Year	Utah 2017.Q3 Sch 38 Wind 31.0% CF (2)	Utah 2017.Q2 Sch 38 Wind 31.0% CF (2)	Difference
2018	\$19.01	\$19.10	(\$0.08)
2019	\$17.34	\$19.13	(\$1.80)
2020	\$15.75	\$18.39	(\$2.64)
2021	\$17.48	\$18.03	(\$0.54)
2022	\$18.44	\$19.41	(\$0.97)
2023	\$19.16	\$20.50	(\$1.34)
2024	\$22.36	\$21.01	\$1.36
2025	\$25.56	\$21.66	\$3.89
2026	\$24.99	\$22.67	\$2.32
2027	\$26.08	\$23.66	\$2.42
2028	\$28.57	\$25.64	\$2.92
2029	\$31.10	\$31.25	(\$0.15)
2030	\$33.79	\$34.37	(\$0.58)
2031	\$35.22	\$36.16	(\$0.94)
2032	\$36.50	\$38.03	(\$1.53)

15-Year Levelized Prices (Nominal) @ 6.570% Discount Rate (1) (3)  
 2018-2032 \$/MWh \$23.041 (4) \$23.036 (4) \$0.0050

Footnotes:

- (2) Total Avoided Costs with Capacity, based on stated CF
- (3) 15-Years: 2018 - 2032
- (4) Levelized Monthly

**Table 1**  
**Avoided Cost Prices**  
**Utah 2017.Q3 Sch 38 Wind - 80.0 MW and 31.0% CF**

Year	Capacity Price \$/kW-yr	Energy Only Price \$/MWh <sup>(2)</sup>	Total Price @ 31.0% Capacity Factor \$/MWh
2018	\$0.00	\$19.01	\$19.01
2019	\$0.00	\$17.34	\$17.34
2020	\$0.00	\$15.75	\$15.75
2021	\$0.00	\$17.48	\$17.48
2022	\$0.00	\$18.44	\$18.44
2023	\$0.00	\$19.16	\$19.16
2024	\$0.00	\$22.36	\$22.36
2025	\$0.00	\$25.56	\$25.56
2026	\$0.00	\$24.99	\$24.99
2027	\$0.00	\$26.08	\$26.08
2028	\$0.00	\$28.57	\$28.57
2029	\$0.00	\$31.10	\$31.10
2030	\$0.00	\$33.79	\$33.79
2031	\$0.00	\$35.22	\$35.22
2032	\$0.00	\$36.50	\$36.50
2033	\$0.00	\$39.43	\$39.43
2034	\$0.00	\$41.12	\$41.12
2035	\$0.00	\$44.58	\$44.58
2036	\$256.82	(\$7.67)	\$86.51

2018-2032	15-Year Levelized Prices (Nominal) @ 6.570% Discount Rate (1) (3)		
	\$/kW	\$0.00	
	\$/MWh		\$23.04 (3)
2020-2034	15 year Levelized Prices (Nominal) @ 6.57% Discount Rate (1) (3)		
	\$/kW	\$0.00	
	\$/MWh		\$25.57 (3)

Footnotes:

- (1) Discount Rate - 2017 IRP
- (2) 'Energy Only' is the GRID calculated costs and includes some capacity costs.
- (3) Levelized Monthly

**Table 2**  
**Avoided Energy Costs - Scheduled Hours (\$/MWh)**  
**Utah 2017.Q2 - 100.0 MW and 85.0% CF**

Year	Annual	Winter Season					Summer Season				Winter Season		
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Energy Only</b>													
2018	19.01	21.87	21.62	19.24	17.53	16.25	16.37	20.76	19.23	17.61	17.00	18.62	22.00
2019	17.34	19.02	18.55	19.14	16.40	15.64	13.00	18.13	19.08	16.97	16.25	17.43	18.06
2020	15.75	22.00	18.54	15.58	13.03	12.58	12.58	15.10	14.52	15.13	15.66	15.30	19.06
2021	17.48	20.11	19.37	17.48	14.89	13.96	13.93	16.66	17.88	18.36	17.70	18.89	19.49
2022	18.44	21.23	19.48	19.26	16.89	15.25	15.47	17.50	19.34	17.72	18.03	19.34	21.08
2023	19.16	18.67	20.22	20.21	16.39	14.41	14.56	18.29	19.84	19.03	19.66	23.38	23.10
2024	22.36	24.52	25.03	22.64	19.33	17.96	18.68	20.66	21.56	20.76	20.57	25.78	29.83
2025	25.56	29.94	28.29	24.85	23.46	20.35	21.95	25.90	24.57	24.41	25.67	26.25	30.26
2026	24.99	28.57	28.23	24.34	23.43	20.44	22.63	25.91	24.96	23.67	25.80	25.60	25.91
2027	26.08	28.79	28.84	24.71	24.06	20.70	23.24	28.44	24.86	25.65	27.16	27.57	27.68
2028	28.57	28.77	30.94	27.97	27.05	23.89	25.11	29.12	32.11	27.05	27.71	30.05	31.32
2029	31.10	33.01	28.13	31.60	29.74	26.43	27.39	33.46	36.47	31.65	29.81	30.23	32.21
2030	33.79	33.68	32.59	34.96	30.58	28.55	30.34	37.04	39.75	36.10	31.69	32.92	33.68
2031	35.22	36.99	35.20	34.09	32.69	31.47	30.77	39.11	41.65	38.57	33.08	31.09	35.06
2032	36.50	39.13	35.74	35.00	32.51	32.19	31.06	39.84	42.47	39.90	35.97	32.32	38.32
2033	39.43	39.50	40.47	37.01	36.52	32.66	33.92	43.56	45.62	43.67	38.08	36.48	41.51
2034	41.12	41.87	40.53	39.65	37.71	34.70	35.25	44.63	47.83	44.37	39.40	38.30	44.81
2035	44.58	45.97	43.02	42.99	39.91	36.93	37.02	54.31	50.95	46.61	41.85	42.19	47.64
2036	(7.67)	(5.64)	(26.38)	(23.05)	(27.26)	(16.65)	(9.95)	5.98	8.61	2.15	3.93	(8.72)	(12.88)

**Table 3**  
**2017 IRP ID Wind Resource**  
**38% Capacity Factor**

Year	Estimated Capital Cost \$/kW	Capital Cost at Real Levelized Rate \$/kW-yr	Fixed O&M \$/kW-yr	Fixed Costs \$/MWh	Variable O&M \$/MWh	Tax Credit \$/MWh	Total Resource Costs \$/MWh	Total Resource Costs \$/kW-yr	Wind Integration Cost \$/MWh
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(h)
<b>2017 IRP ID Wind Resource - 38% Capacity Factor</b>									
2016	\$1,811	\$127.99	\$37.57	\$49.74	\$0.00	-	\$49.74	\$165.56	\$0.57
2017		\$130.43	\$38.28	\$50.68	\$0.00	\$0.00	\$50.68	\$168.71	\$0.58
2018		\$132.78	\$38.97	\$51.60	\$0.00	\$0.00	\$51.60	\$171.75	\$0.59
2019		\$135.83	\$39.87	\$52.78	\$0.00	\$0.00	\$52.78	\$175.70	\$0.60
2020		\$139.36	\$40.91	\$54.15	\$0.00	\$0.00	\$54.15	\$180.27	\$0.62
2021		\$142.70	\$41.89	\$55.45	\$0.00	\$0.00	\$55.45	\$184.59	\$0.63
2022		\$145.98	\$42.85	\$56.73	\$0.00	\$0.00	\$56.73	\$188.83	\$0.64
2023		\$149.34	\$43.84	\$58.03	\$0.00	\$0.00	\$58.03	\$193.18	\$0.65
2024		\$152.77	\$44.85	\$59.37	\$0.00	\$0.00	\$59.37	\$197.62	\$0.66
2025		\$156.28	\$45.88	\$60.73	\$0.00	\$0.00	\$60.73	\$202.16	\$0.68
2026		\$159.72	\$46.89	\$62.07	\$0.00	\$0.00	\$62.07	\$206.61	\$0.69
2027		\$163.23	\$47.92	\$63.43	\$0.00	\$0.00	\$63.43	\$211.15	\$0.71
2028		\$166.82	\$48.97	\$64.83	\$0.00	\$0.00	\$64.83	\$215.79	\$0.73
2029		\$170.49	\$50.05	\$66.25	\$0.00	\$0.00	\$66.25	\$220.54	\$0.75
2030		\$174.24	\$51.15	\$67.71	\$0.00	\$0.00	\$67.71	\$225.39	\$0.77
2031		\$178.07	\$52.28	\$69.20	\$0.00	\$0.00	\$69.20	\$230.35	\$0.79
2032		\$181.99	\$53.43	\$70.72	\$0.00	\$0.00	\$70.72	\$235.42	\$0.81
2033		\$185.99	\$54.61	\$72.28	\$0.00	\$0.00	\$72.28	\$240.60	\$0.83
2034		\$190.08	\$55.81	\$73.87	\$0.00	\$0.00	\$73.87	\$245.89	\$0.85
2035		\$194.26	\$57.04	\$75.49	\$0.00	\$0.00	\$75.49	\$251.30	\$0.87
2036		\$198.53	\$58.29	\$77.15	\$0.00	\$0.00	\$77.15	\$256.82	\$0.89
2037		\$202.90	\$59.57	\$78.85	\$0.00	\$0.00	\$78.85	\$262.47	\$0.91
2038		\$207.36	\$60.88	\$80.58	\$0.00	\$0.00	\$80.58	\$268.24	\$0.93
2039		\$211.92	\$62.22	\$82.35	\$0.00	\$0.00	\$82.35	\$274.14	\$0.95
2040		\$216.58	\$63.59	\$84.17	\$0.00	\$0.00	\$84.17	\$280.17	\$0.97
2041		\$221.34	\$64.99	\$86.02	\$0.00	\$0.00	\$86.02	\$286.33	\$0.99
2042		\$226.21	\$66.42	\$87.91	\$0.00	\$0.00	\$87.91	\$292.63	\$1.01

**Sources, Inputs and Assumptions**

Source:	(c)(f)	Plant Costs - 2017 IRP - Table 6.1 & 6.2	
	(a)	Plant capacity cost	
	(b)	= (a) x 0.0706748586244695	
	(d)	= ((b) + (c)) / (8.76 x 38.0%)	
	(g)	= (d) + (f)	
	(h)	Plant Costs - 2017 IRP - Table 6.1 & 6.2	

2017 IRP ID Wind Resource - 38% Capacity Factor	
Wind	Cost and Input Assumptions

2016 \$	\$1,811	Plant capacity cost	\$/kW-yr
2016 \$	\$37.57	Fixed O&M, plus on-going capital cost	\$/kW-yr
2016 \$	0.57	Integration Cost	\$/MWh
2016 \$	\$0.00	Variable O&M	\$/MWh
2016 \$		Tax Credit	\$/MWh
	7.067%	Payment Factor	
	38%	Capacity Factor	

Company Official Inflation Forecast Dated September 29, 2017						
2017	1.9%	2026	2.2%	2035		2.2%
2018	1.8%	2027	2.2%	2036		2.2%
2019	2.3%	2028	2.2%	2037		2.2%
2020	2.6%	2029	2.2%	2038		2.2%
2021	2.4%	2030	2.2%	2039		2.2%
2022	2.3%	2031	2.2%	2040		2.2%
2023	2.3%	2032	2.2%	2041		2.2%
2024	2.3%	2033	2.2%	2042		2.2%

**Table 4**  
**Burnertip Natural Gas Price Forecast**  
**Utah 2017.Q3 Sch 38 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	\$2.29	\$2.35
2017	\$2.73	\$2.65	\$2.77
2018	\$2.67	\$2.50	\$2.66
2019	\$2.51	\$2.39	\$2.51
2020	\$2.47	\$2.38	\$2.45
2021	\$2.49	\$2.40	\$2.48
2022	\$2.51	\$2.42	\$2.50
2023	\$2.64	\$2.57	\$2.67
2024	\$3.34	\$3.30	\$3.37
2025	\$3.91	\$3.89	\$3.94
2026	\$3.91	\$3.88	\$3.94
2027	\$4.05	\$4.02	\$4.08
2028	\$4.24	\$4.20	\$4.27
2029	\$4.53	\$4.49	\$4.56
2030	\$4.83	\$4.78	\$4.86
2031	\$5.08	\$5.03	\$5.11
2032	\$5.25	\$5.19	\$5.28
2033	\$5.48	\$5.42	\$5.52
2034	\$5.71	\$5.65	\$5.74
2035	\$5.90	\$5.84	\$5.94
2036	\$6.25	\$6.19	\$6.29
2037	\$6.43	\$6.35	\$6.47
2038	\$6.71	\$6.62	\$6.75
2039	\$6.86	\$6.77	\$6.90
2040	\$7.03	\$6.95	\$7.08
2041	\$7.19	\$7.10	\$7.23
2042	\$4.91	\$4.86	\$4.94

**Table 5**  
**Utah 2017.Q3 Sch 38 Wind - 80.0 MW and 31.0% CF**  
**January 2018 through December 2036**  
**Nominal Avoided Costs Calculated Monthly**

15 year starting 2020	\$	53,534,569	\$	-	\$	53,534,569	2,093,965	\$25.57
<b>Nominal NPV at 6.57% Discount Rate</b>								
15 Year starting 2018	\$	48,242,104	\$	-	\$	48,242,104	2,093,750	\$23.04

Month	Energy	Capacity \$	Total	Total	AC Price
	Avoided \$	31.0% CF	Dollars	MWH	31.0% CF
Jan-18	361,089	-	361,089	16,514	21.87
Feb-18	298,720	-	298,720	13,817	21.62
Mar-18	324,741	-	324,741	16,879	19.24
Apr-18	254,224	-	254,224	14,505	17.53
May-18	232,623	-	232,623	14,311	16.25
Jun-18	293,960	-	293,960	17,961	16.37
Jul-18	429,014	-	429,014	20,667	20.76
Aug-18	413,481	-	413,481	21,506	19.23
Sep-18	371,552	-	371,552	21,102	17.61
Oct-18	343,723	-	343,723	20,214	17.00
Nov-18	375,782	-	375,782	20,178	18.62
Dec-18	436,782	-	436,782	19,857	22.00
Jan-19	314,107	-	314,107	16,514	19.02
Feb-19	256,254	-	256,254	13,817	18.55
Mar-19	323,070	-	323,070	16,879	19.14
Apr-19	237,849	-	237,849	14,505	16.40
May-19	223,814	-	223,814	14,311	15.64
Jun-19	233,425	-	233,425	17,961	13.00
Jul-19	374,701	-	374,701	20,667	18.13
Aug-19	410,254	-	410,254	21,506	19.08
Sep-19	358,207	-	358,207	21,102	16.97
Oct-19	328,550	-	328,550	20,214	16.25
Nov-19	351,768	-	351,768	20,178	17.43
Dec-19	358,673	-	358,673	19,857	18.06
Jan-20	363,223	-	363,223	16,514	22.00
Feb-20	268,023	-	268,023	14,458	18.54
Mar-20	262,999	-	262,999	16,879	15.58
Apr-20	189,021	-	189,021	14,505	13.03
May-20	180,062	-	180,062	14,311	12.58
Jun-20	226,009	-	226,009	17,961	12.58
Jul-20	312,114	-	312,114	20,667	15.10
Aug-20	312,167	-	312,167	21,506	14.52
Sep-20	319,364	-	319,364	21,102	15.13
Oct-20	316,571	-	316,571	20,214	15.66
Nov-20	308,736	-	308,736	20,178	15.30
Dec-20	378,388	-	378,388	19,857	19.06
Jan-21	332,080	-	332,080	16,514	20.11
Feb-21	267,642	-	267,642	13,817	19.37
Mar-21	295,124	-	295,124	16,879	17.48
Apr-21	215,982	-	215,982	14,505	14.89
May-21	199,734	-	199,734	14,311	13.96
Jun-21	250,114	-	250,114	17,961	13.93
Jul-21	344,278	-	344,278	20,667	16.66
Aug-21	384,599	-	384,599	21,506	17.88
Sep-21	387,477	-	387,477	21,102	18.36
Oct-21	357,714	-	357,714	20,214	17.70
Nov-21	381,067	-	381,067	20,178	18.89
Dec-21	387,088	-	387,088	19,857	19.49
Jan-22	350,550	-	350,550	16,514	21.23
Feb-22	269,105	-	269,105	13,817	19.48
Mar-22	325,163	-	325,163	16,879	19.26



Apr-22	244,923	-	244,923	14,505	16.89
May-22	218,237	-	218,237	14,311	15.25
Jun-22	277,867	-	277,867	17,961	15.47
Jul-22	361,578	-	361,578	20,667	17.50
Aug-22	415,979	-	415,979	21,506	19.34
Sep-22	374,007	-	374,007	21,102	17.72
Oct-22	364,383	-	364,383	20,214	18.03
Nov-22	390,241	-	390,241	20,178	19.34
Dec-22	418,652	-	418,652	19,857	21.08
Jan-23	308,251	-	308,251	16,514	18.67
Feb-23	279,356	-	279,356	13,817	20.22
Mar-23	341,196	-	341,196	16,879	20.21
Apr-23	237,739	-	237,739	14,505	16.39
May-23	206,238	-	206,238	14,311	14.41
Jun-23	261,484	-	261,484	17,961	14.56
Jul-23	378,016	-	378,016	20,667	18.29
Aug-23	426,750	-	426,750	21,506	19.84
Sep-23	401,549	-	401,549	21,102	19.03
Oct-23	397,317	-	397,317	20,214	19.66
Nov-23	471,669	-	471,669	20,178	23.38
Dec-23	458,646	-	458,646	19,857	23.10
Jan-24	404,985	-	404,985	16,514	24.52
Feb-24	361,871	-	361,871	14,458	25.03
Mar-24	382,167	-	382,167	16,879	22.64
Apr-24	280,346	-	280,346	14,505	19.33
May-24	256,984	-	256,984	14,311	17.96
Jun-24	335,554	-	335,554	17,961	18.68
Jul-24	427,031	-	427,031	20,667	20.66
Aug-24	463,737	-	463,737	21,506	21.56
Sep-24	438,011	-	438,011	21,102	20.76
Oct-24	415,899	-	415,899	20,214	20.57
Nov-24	520,097	-	520,097	20,178	25.78
Dec-24	592,241	-	592,241	19,857	29.83
Jan-25	494,447	-	494,447	16,514	29.94
Feb-25	390,955	-	390,955	13,817	28.29
Mar-25	419,507	-	419,507	16,879	24.85
Apr-25	340,335	-	340,335	14,505	23.46
May-25	291,294	-	291,294	14,311	20.35
Jun-25	394,207	-	394,207	17,961	21.95
Jul-25	535,241	-	535,241	20,667	25.90
Aug-25	528,483	-	528,483	21,506	24.57
Sep-25	515,132	-	515,132	21,102	24.41
Oct-25	518,848	-	518,848	20,214	25.67
Nov-25	529,702	-	529,702	20,178	26.25
Dec-25	600,807	-	600,807	19,857	30.26
Jan-26	471,717	-	471,717	16,514	28.57
Feb-26	390,035	-	390,035	13,817	28.23
Mar-26	410,835	-	410,835	16,879	24.34
Apr-26	339,849	-	339,849	14,505	23.43
May-26	292,478	-	292,478	14,311	20.44
Jun-26	406,464	-	406,464	17,961	22.63
Jul-26	535,490	-	535,490	20,667	25.91
Aug-26	536,875	-	536,875	21,506	24.96
Sep-26	499,436	-	499,436	21,102	23.67
Oct-26	521,596	-	521,596	20,214	25.80
Nov-26	516,614	-	516,614	20,178	25.60
Dec-26	514,510	-	514,510	19,857	25.91
Jan-27	475,422	-	475,422	16,514	28.79
Feb-27	398,500	-	398,500	13,817	28.84
Mar-27	417,087	-	417,087	16,879	24.71
Apr-27	349,038	-	349,038	14,505	24.06
May-27	296,302	-	296,302	14,311	20.70

Jun-27	417,321	-	417,321	17,961	23.24
Jul-27	587,847	-	587,847	20,667	28.44
Aug-27	534,634	-	534,634	21,506	24.86
Sep-27	541,206	-	541,206	21,102	25.65
Oct-27	548,996	-	548,996	20,214	27.16
Nov-27	556,334	-	556,334	20,178	27.57
Dec-27	549,667	-	549,667	19,857	27.68
Jan-28	475,157	-	475,157	16,514	28.77
Feb-28	447,326	-	447,326	14,458	30.94
Mar-28	472,092	-	472,092	16,879	27.97
Apr-28	392,431	-	392,431	14,505	27.05
May-28	341,855	-	341,855	14,311	23.89
Jun-28	451,059	-	451,059	17,961	25.11
Jul-28	601,874	-	601,874	20,667	29.12
Aug-28	690,497	-	690,497	21,506	32.11
Sep-28	570,764	-	570,764	21,102	27.05
Oct-28	560,176	-	560,176	20,214	27.71
Nov-28	606,405	-	606,405	20,178	30.05
Dec-28	621,922	-	621,922	19,857	31.32
Jan-29	545,193	-	545,193	16,514	33.01
Feb-29	388,717	-	388,717	13,817	28.13
Mar-29	533,328	-	533,328	16,879	31.60
Apr-29	431,308	-	431,308	14,505	29.74
May-29	378,193	-	378,193	14,311	26.43
Jun-29	491,997	-	491,997	17,961	27.39
Jul-29	691,586	-	691,586	20,667	33.46
Aug-29	784,230	-	784,230	21,506	36.47
Sep-29	667,818	-	667,818	21,102	31.65
Oct-29	602,506	-	602,506	20,214	29.81
Nov-29	609,967	-	609,967	20,178	30.23
Dec-29	639,569	-	639,569	19,857	32.21
Jan-30	556,151	-	556,151	16,514	33.68
Feb-30	450,252	-	450,252	13,817	32.59
Mar-30	590,175	-	590,175	16,879	34.96
Apr-30	443,626	-	443,626	14,505	30.58
May-30	408,534	-	408,534	14,311	28.55
Jun-30	544,987	-	544,987	17,961	30.34
Jul-30	765,492	-	765,492	20,667	37.04
Aug-30	854,909	-	854,909	21,506	39.75
Sep-30	761,694	-	761,694	21,102	36.10
Oct-30	640,663	-	640,663	20,214	31.69
Nov-30	664,330	-	664,330	20,178	32.92
Dec-30	668,713	-	668,713	19,857	33.68
Jan-31	610,898	-	610,898	16,514	36.99
Feb-31	486,311	-	486,311	13,817	35.20
Mar-31	575,492	-	575,492	16,879	34.09
Apr-31	474,192	-	474,192	14,505	32.69
May-31	450,306	-	450,306	14,311	31.47
Jun-31	552,695	-	552,695	17,961	30.77
Jul-31	808,335	-	808,335	20,667	39.11
Aug-31	895,681	-	895,681	21,506	41.65
Sep-31	814,017	-	814,017	21,102	38.57
Oct-31	668,664	-	668,664	20,214	33.08
Nov-31	627,243	-	627,243	20,178	31.09
Dec-31	696,141	-	696,141	19,857	35.06
Jan-32	646,144	-	646,144	16,514	39.13
Feb-32	516,689	-	516,689	14,458	35.74
Mar-32	590,816	-	590,816	16,879	35.00
Apr-32	471,527	-	471,527	14,505	32.51
May-32	460,646	-	460,646	14,311	32.19
Jun-32	557,854	-	557,854	17,961	31.06
Jul-32	823,286	-	823,286	20,667	39.84

Aug-32	913,404	-	913,404	21,506	42.47
Sep-32	842,064	-	842,064	21,102	39.90
Oct-32	727,182	-	727,182	20,214	35.97
Nov-32	652,245	-	652,245	20,178	32.32
Dec-32	760,826	-	760,826	19,857	38.32
Jan-33	652,310	-	652,310	16,514	39.50
Feb-33	559,131	-	559,131	13,817	40.47
Mar-33	624,773	-	624,773	16,879	37.01
Apr-33	529,675	-	529,675	14,505	36.52
May-33	467,388	-	467,388	14,311	32.66
Jun-33	609,157	-	609,157	17,961	33.92
Jul-33	900,308	-	900,308	20,667	43.56
Aug-33	981,104	-	981,104	21,506	45.62
Sep-33	921,615	-	921,615	21,102	43.67
Oct-33	769,799	-	769,799	20,214	38.08
Nov-33	736,136	-	736,136	20,178	36.48
Dec-33	824,293	-	824,293	19,857	41.51
Jan-34	691,498	-	691,498	16,514	41.87
Feb-34	559,957	-	559,957	13,817	40.53
Mar-34	669,316	-	669,316	16,879	39.65
Apr-34	547,034	-	547,034	14,505	37.71
May-34	496,603	-	496,603	14,311	34.70
Jun-34	633,124	-	633,124	17,961	35.25
Jul-34	922,413	-	922,413	20,667	44.63
Aug-34	1,028,543	-	1,028,543	21,506	47.83
Sep-34	936,400	-	936,400	21,102	44.37
Oct-34	796,549	-	796,549	20,214	39.40
Nov-34	772,885	-	772,885	20,178	38.30
Dec-34	889,724	-	889,724	19,857	44.81
Jan-35	759,168	-	759,168	16,514	45.97
Feb-35	594,461	-	594,461	13,817	43.02
Mar-35	725,626	-	725,626	16,879	42.99
Apr-35	578,885	-	578,885	14,505	39.91
May-35	528,447	-	528,447	14,311	36.93
Jun-35	664,901	-	664,901	17,961	37.02
Jul-35	1,122,528	-	1,122,528	20,667	54.31
Aug-35	1,095,712	-	1,095,712	21,506	50.95
Sep-35	983,555	-	983,555	21,102	46.61
Oct-35	845,906	-	845,906	20,214	41.85
Nov-35	851,384	-	851,384	20,178	42.19
Dec-35	945,929	-	945,929	19,857	47.64
Jan-36	(93,058)	1,712,133	1,619,075	16,514	98.04
Feb-36	(381,416)	1,712,133	1,330,717	14,458	92.04
Mar-36	(389,028)	1,712,133	1,323,105	16,879	78.39
Apr-36	(395,410)	1,712,133	1,316,723	14,505	90.78
May-36	(238,297)	1,712,133	1,473,836	14,311	102.99
Jun-36	(178,678)	1,712,133	1,533,455	17,961	85.38
Jul-36	123,572	1,712,133	1,835,706	20,667	88.82
Aug-36	185,064	1,712,133	1,897,198	21,506	88.22
Sep-36	45,364	1,712,133	1,757,498	21,102	83.28
Oct-36	79,530	1,712,133	1,791,664	20,214	88.63
Nov-36	(175,939)	1,712,133	1,536,194	20,178	76.13
Dec-36	(255,811)	1,712,133	1,456,322	19,857	73.34


**ROCKY MOUNTAIN POWER**

**DOCKET 03-035-14 AND DOCKET 17-035-37**

**STEP STUDY BETWEEN PRIOR FILING AND CURRENT FILING**

**2017.Q3 - DECEMBER 2017**

## Appendix C

### Utah Quarterly Compliance Filing Step Study between 2017.Q3 and 2017.Q2 Compliance Filing Avoided Cost Impact of Changing Assumptions \$/MWH (1)

Year	Generic Update	OFPC 1709	Queue	Total Impact
2018	\$ 0.61	\$ (0.59)	\$ (0.07)	\$ (0.06)
2019	\$ 0.03	\$ (1.78)	\$ (0.15)	\$ (1.89)
2020	\$ 0.83	\$ (2.63)	\$ (0.21)	\$ (2.01)
2021	\$ 0.60	\$ (0.99)	\$ 0.04	\$ (0.35)
2022	\$ 0.89	\$ (1.71)	\$ (0.09)	\$ (0.91)
2023	\$ 0.44	\$ (1.33)	\$ (0.12)	\$ (1.01)
2024	\$ 0.69	\$ 1.39	\$ (0.20)	\$ 1.88
2025	\$ 1.19	\$ 3.39	\$ (0.17)	\$ 4.41
2026	\$ 0.81	\$ 2.18	\$ (0.21)	\$ 2.79
2027	\$ 0.92	\$ 2.24	\$ (0.28)	\$ 2.88
2028	\$ 0.71	\$ 2.20	\$ (0.19)	\$ 2.72
2029	\$ 0.66	\$ (0.04)	\$ (0.22)	\$ 0.40
2030	\$ 0.72	\$ (0.41)	\$ (0.47)	\$ (0.16)
2031	\$ 0.61	\$ (0.55)	\$ (0.54)	\$ (0.49)
2032	\$ 0.30	\$ (1.21)	\$ (0.19)	\$ (1.11)

Nominal Levelized Payment at 6.570% Discount Rate (3)

2018 - 2032	\$ 0.66	\$ (0.18)	\$ (0.18)	\$ 0.30
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- (1) Studies are sequential. The order of the studies would affect the price impac
- (2) Official Forward Price Curve Dated September 2017
- (3) Discount Rate - 2017 IRP

## Appendix C

### Utah Quarterly Compliance Filing Step Study between 2017.Q3 and 2017.Q2 Compliance Filing Total Avoided Cost Prices \$/MWH (1) (4)

Year	2017.Q2 As Filed	Generic Update	OFPC 1709	Queue
2018	\$20.741	\$21.352	\$20.759	\$20.686
2019	\$20.727	\$20.761	\$18.982	\$18.836
2020	\$18.945	\$19.771	\$17.142	\$16.932
2021	\$19.212	\$19.813	\$18.823	\$18.863
2022	\$20.820	\$21.711	\$20.002	\$19.909
2023	\$21.751	\$22.191	\$20.860	\$20.738
2024	\$22.378	\$23.067	\$24.456	\$24.255
2025	\$23.237	\$24.424	\$27.816	\$27.642
2026	\$24.606	\$25.420	\$27.600	\$27.391
2027	\$25.517	\$26.438	\$28.674	\$28.399
2028	\$27.695	\$28.400	\$30.599	\$30.410
2029	\$32.133	\$32.790	\$32.754	\$32.533
2030	\$35.158	\$35.877	\$35.465	\$34.994
2031	\$36.912	\$37.518	\$36.965	\$36.426
2032	\$38.807	\$39.104	\$37.890	\$37.700

Nominal Levelized Payment at 6.570% Discount Rate (3)

2018 - 2032	\$24.370	\$25.026	\$24.848	\$24.668
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- (1) Studies are sequential. The order of the studies would affect the price impact.
- (2) Official Forward Price Curve Dated September 2017
- (3) Discount Rate - 2017 IRP
- (4) Capacity costs are allocated assuming an 85% capacity factor.

## Appendix C

### Utah Quarterly Compliance Filing Step Study between 2017.Q3 and 2017.Q2 Compliance Filing GRID Calculated Energy Avoided Cost Prices \$/MWH (1)

Year	2017.Q2 As Filed	Generic Update	OFPC 1709	Queue
2018	\$20.741	\$21.352	\$20.759	\$20.686
2019	\$20.727	\$20.761	\$18.982	\$18.836
2020	\$18.945	\$19.771	\$17.142	\$16.932
2021	\$19.212	\$19.813	\$18.823	\$18.863
2022	\$20.820	\$21.711	\$20.002	\$19.909
2023	\$21.751	\$22.191	\$20.860	\$20.738
2024	\$22.378	\$23.067	\$24.456	\$24.255
2025	\$23.237	\$24.424	\$27.816	\$27.642
2026	\$24.606	\$25.420	\$27.600	\$27.391
2027	\$25.517	\$26.438	\$28.674	\$28.399
2028	\$27.695	\$28.400	\$30.599	\$30.410
2029	\$32.133	\$32.790	\$32.754	\$32.533
2030	\$35.158	\$35.877	\$35.465	\$34.994
2031	\$36.912	\$37.518	\$36.965	\$36.426
2032	\$38.807	\$39.104	\$37.890	\$37.700

Nominal Levelized Payment at 6.57% Discount Rate (3) (4)

2018 - 2032	\$24.371	\$25.026	\$24.848	\$24.668
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- (1) Studies are sequential. The order of the studies would affect the price impact.
- (2) Official Forward Price Curve Dated September 2017
- (3) Discount Rate - 2017 IRP
- (4) 15-Year Nominal Levelized Payment (2018-2032)



## Appendix C

### Utah Quarterly Compliance Filing Step Study between 2017.Q3 and 2017.Q2 Compliance Filing Capacity Avoided Cost Prices

Year	\$/kW-Year		\$/MWH (1)	
	2017.Q2 (3)	2017.Q3 (3)	2017.Q2 (3)	2017.Q3 (3)
2018	-	-	-	-
2019	-	-	-	-
2020	-	-	-	-
2021	-	-	-	-
2022	-	-	-	-
2023	-	-	-	-
2024	-	-	-	-
2025	-	-	-	-
2026	-	-	-	-
2027	-	-	-	-
2028	-	-	-	-
2029	-	-	-	-
2030	-	-	-	-
2031	-	-	-	-
2032	-	-	-	-

Nominal Levelized Payment at 6.570% Discount Rate (2)

2018 - 2032	\$0.00	\$0.00	\$0.00	\$0.00
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- (1) Capacity costs are allocated assuming an 85% capacity factor.
- (2) Discount Rate - 2017 IRP
- (3) No Capacity costs-All of the 2017 IRP Thermal resources are deferred due to the size of the

## CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing **Quarterly Compliance Filing – Avoided Cost Input Changes** in Docket Nos. 03-035-14 and 17-035-37 was served upon the following by email on December 21, 2017.

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