

Rocky Mountain Power  
Docket No. 16-035-36  
Witness: Robert M. Meredith

BEFORE THE PUBLIC SERVICE COMMISSION  
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

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Surrebuttal Testimony of Robert M. Meredith

May 2017

1 **Q. Are you the same Robert M. Meredith that presented direct and rebuttal**  
2 **testimony in phase III of proceeding?**

3 A. Yes, I am.

4 **Purpose of Surrebuttal Testimony**

5 **Q. What is the purpose of your surrebuttal testimony?**

6 A. The purpose of my surrebuttal testimony is to summarize and respond to the positions  
7 of various parties concerning the energy charges and time of use periods for the Electric  
8 Vehicle Time of Use (“EV TOU”) Pilot proposed by the Company in Phase III of this  
9 proceeding, and to describe why the Company’s proposed rates and time periods for  
10 the pilot continue to be the most reasonable and well-suited to meet the objectives of  
11 the Sustainable Transportation and Energy Plan Act (“STEP Act”) among those offered  
12 up by other parties. Aspects of the EV TOU Pilot other than the rates and time periods  
13 have been agreed to by parties in the Stipulation and Partial Settlement Agreement of  
14 Phase III Issues, filed along with this surrebuttal testimony on May 16, 2017.

15 **Discussion of Rebuttal Testimony from Other Parties**

16 **Q. Do the rebuttal testimonies from other parties introduce any new issues related to**  
17 **the EV TOU Pilot?**

18 A. I do not think that rebuttal from other parties introduces any significant new issues  
19 related to the EV TOU Pilot which are different than those raised in direct testimony.

20 **Q. Do the rebuttal testimonies from other parties provide any new arguments for**  
21 **their positions regarding certain elements of the Company’s proposed pilot?**

22 A. While some parties have modified their positions and have provided arguments against  
23 some of the positions of parties other than the Company’s, I do not think that any new

24 arguments have been made to support the various positions which parties have taken  
25 against aspects of the Company's proposal.

26 **Positions of Other Parties**

27 **Q. Since the parties have reached a partial settlement that covers many design and**  
28 **tariff features of the EV TOU Pilot, what issues still remain in dispute?**

29 A. The following issues for the proposed pilot are still in dispute:

- 30 • Should the rates or one of the rate options for the EV TOU Pilot include inverted  
31 tier prices, such that energy is more expensive for higher monthly usage?
- 32 • What should be the difference in price for energy charges during the on-peak  
33 period as compared to the off-peak period(s)?
- 34 • What are the appropriate time periods for the EV TOU Pilot under which energy  
35 prices would vary?
- 36 • Should there be a rate option that includes a super off-peak energy charge for  
37 charging during the middle of the night?

38 **Q. Have you summarized the positions of the parties on these different issues?**

39 A. Yes. Exhibit RMP\_\_\_(RMM-1SR) summarizes the Company's understanding of the  
40 positions taken by the Division of Public Utilities ("DPU"), Office of Consumer  
41 Services ("OCS"), Western Resource Advocates ("WRA"), and Utah Clean Energy  
42 ("UCE") on these different items.

43 **Q. What observations do you have from Exhibit RMP\_\_\_(RMM-1SR)?**

44 A. There is a wide diversity of opinions among the parties. None of the parties are fully  
45 aligned on all of the items. Every party holds a different position from the Company on  
46 at least one of the issue. Also for all items, there is at least one party that supports the

47 Company's position. From my perspective, Exhibit RMP\_\_\_(RMM-1SR)  
48 demonstrates that trying to achieve consensus on these various items is very  
49 challenging. I also think that Exhibit RMP\_\_\_(RMM-1SR) shows the Company's  
50 proposed pilot is reasonable because it balances many of the interests of the parties.

51 **Proposed EV TOU Pilot**

52 **Q. Please describe how the Company's proposed time periods and rates for an EV**  
53 **TOU Pilot would be valuable for customers.**

54 A. Plug-in electric vehicles ("PEV") are a relatively nascent market. PEV charging also  
55 presents a new type of load that may be very flexible. If this charging occurs largely  
56 outside of times when the Company's system peaks, this load has the potential to put  
57 downward pressure on rates over time. If enough of this charging occurs when the  
58 Company's system peaks, this load could make Company investments occur earlier  
59 than they would otherwise, potentially putting upward pressure on rates over time. One  
60 key way to encourage PEV adoption that occurs outside of those times when the  
61 Company's system peaks is to offer time of use pricing. Recognizing this opportunity,  
62 the legislature included a provision in the STEP Act that the Commission would  
63 authorize a program that promotes customer choice in electric vehicle charging  
64 equipment and service that includes "time of use pricing for electric vehicle charging."

65 The Company's proposed EV TOU Pilot includes two very simple, easy to  
66 understand rate options. One option would have a moderate difference in price between  
67 two time periods and another would have a more pronounced difference in price. For  
68 the proposed pilot, a load research study would be conducted on both rate options as  
69 well as a control group. Up to 1,000 customers could also opt-in to one of the rate

70 options separately from the load research study. From the load research study, the  
71 Company would hope to obtain valuable information about when PEV charging  
72 naturally occurs absent a time-based price signal as well as how customers respond  
73 when on one of these two rate options. Along with customer perceptions of the rates,  
74 the Company would also hope to learn from the pilot what impact, if any, the time of  
75 use options would have on PEV adoption. From the information gleaned from the  
76 proposed pilot, a more broadly available time of use rate offering, targeted to customers  
77 with PEVs, could be developed which would be informed by the pilot.

78 **Q. Why do you think that the Company's proposed pilot plans and rates are more**  
79 **reasonable than the counter proposals from other parties?**

80 A. The different parties generally agree that the EV TOU Pilot should include two different  
81 rate options. Offering more than two options could be confusing for customers and  
82 could make it challenging to draw clear conclusions. From these two rate options, the  
83 advantages and disadvantages of both can be studied. With two different rates, there  
84 are many different ideas which could be tested. In their direct and rebuttal testimonies,  
85 other parties suggest that the two options could test energy price tiers, different time  
86 periods, and having three pricing periods instead of two. The Company believes that  
87 testing how large of a difference in price exists between two time periods would be the  
88 most important variable to study. Ultimately, consumers, if they are able, respond and  
89 change behavior relative to the prices that they see.

90 Exhibit RMP\_\_\_(RMM-ISR), which I presented earlier in this testimony,  
91 shows the various positions of parties on a few aspects of the rates and time periods of

92 an EV TOU Pilot. I will now address each of these aspects and explain why I think the  
93 Company's position will best serve the interests of customers.

94 **Inverted Tier Energy Prices**

95 **Q. Why do the Company's proposed rate options not include energy price tiers,**  
96 **where energy is more expensive with higher overall monthly usage?**

97 A. Including both tiered rates and time of use pricing could be potentially very confusing  
98 for customers. Keeping rate options simple and easy to evaluate will help customers be  
99 able to make the choice to participate and will better reflect an economic price signal  
100 than tiers, which just encourage a reduction in total monthly energy consumption. In  
101 this pilot, tiers would distract from the primary message for customers to manage their  
102 hourly energy consumption with time of use.

103 Furthermore, tiered prices may discourage PEV adoption, since PEVs are often  
104 a new and significant load for customers, and would likely push monthly consumption  
105 into the more costly tiers. While tiers have been generally instituted to encourage  
106 energy efficiency for policy reasons, they can be a barrier for customers seeking to buy  
107 or lease a PEV. PEV adoption can provide potential benefits, so it makes sense to  
108 exclude tiers from this pilot which is specifically targeted for customers who drive  
109 PEVs.

110 **Q. Do you think that an EV TOU Pilot should include one rate option with tiers and**  
111 **another without tiers?**

112 A. No. In their rebuttal testimonies, the DPU<sup>1</sup> and UCE<sup>2</sup> both recommend including one  
113 option that has tiers and one that does not. The OCS also recommends in rebuttal

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<sup>1</sup> See lines 143 through 145 of DPU witness Mr. Robert A. Davis' Rebuttal Testimony.

<sup>2</sup> See lines 109 through 114 of UCE witness Ms. Sarah Wright's Rebuttal Testimony.

114 testimony that this may be a good option.<sup>3</sup> I do not think that including one option with  
115 tiers and another without tiers fits well with objectives and core principles discussed at  
116 the workshops and in my testimony. While understanding the impact that energy price  
117 tiers may have on customer behavior could be interesting, the purpose of having an EV  
118 TOU Pilot is not to put tiered pricing on trial. I think the purpose of an EV TOU Pilot  
119 should be to better understand how customers who drive PEVs respond to time of use  
120 prices, not necessarily tiered energy rates.

121 I also question what inferences could be drawn from such an evaluation of tiered  
122 rate as compared to rates without tiers. For customers outside the load research study,  
123 I think that larger energy users will simply select the option that does not have tiers and  
124 smaller energy users will select the one that does. It could also be more difficult to fully  
125 recruit participants for each stratum in the load research study, because larger energy  
126 users may know about the different options and hesitate to participate in a tiered option  
127 if they were randomly selected for it.

128 **Q. UCE witness Ms. Wright expresses concerns that the Company's proposed rates**  
129 **would reward large users for going on the rate even if they don't shift any usage.<sup>4</sup>**  
130 **Do you think that the Company's proposed rates would unduly reward large**  
131 **users?**

132 A. No. The billing comparisons that I presented in Exhibit RMP\_\_\_(RMM-4) show what  
133 the impacts that the Company's proposed rate options would be for customers with  
134 different energy usage levels who have the *average* energy profile. It is important to  
135 keep in mind that many customers have energy profiles which have more on-peak

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<sup>3</sup> See lines 177 through 183 of UCE witness Ms. Cheryl Murray's Rebuttal Testimony.

<sup>4</sup> See lines 115 through 123 of UCE witness Ms. Sarah Wright's Rebuttal Testimony.

136 energy use than the average customer. While a large energy user might have more to  
137 gain from enrolling in one of the Company's proposed rate options, that customer also  
138 takes on much more risk for the potential of very high bills with time of use prices. I  
139 think that it is inaccurate to portray a large energy user who enrolls and receives a lower  
140 bill as having done nothing to merit those bill savings. That particular high usage  
141 customer has chosen to be subject to time-based rates which present the possibility of  
142 far more risk in absolute dollar terms than for smaller energy users. I think that it is fair  
143 for both large energy users and smaller energy users to face the same cost-based price  
144 signal irrespective of their size.

145 **Q. In Ms. Wright's testimony she recommends including tiered prices that are about**  
146 **2.5 cents per kilowatt hour higher for monthly usage greater than 700 kilowatt**  
147 **hours.<sup>5</sup> What difference could 2.5 cents per kilowatt hour make for a customer**  
148 **who is thinking about whether to buy or lease a PEV?**

149 A. A price that is 2.5 cents higher per kilowatt hour can make a surprisingly large  
150 difference for the economics of a PEV. Please refer to Exhibit RMP\_\_\_\_(RMM-2SR)  
151 for an examination that I prepared of the potential impact of increasing the cost of  
152 charging by 2.5 cents per kilowatt hour. In Exhibit RMP\_\_\_\_(RMM-2SR), I used the  
153 same assumptions as those I presented in Exhibit RMP\_\_\_\_(RMM-5) and examined the  
154 incremental "fuel" savings from charging a PEV off-peak on the Company's proposed  
155 rate option 1 versus charging for 2.5 cents per kilowatt hour more. Exhibit  
156 RMP\_\_\_\_(RMM-2SR) shows that the monthly incremental cost from 2.5 cents per  
157 kilowatt hour is about \$9 a month. From online searches, I have found that right now a

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<sup>5</sup> See Table 1 on UCE witness Ms. Sarah Wright's Rebuttal Testimony.



158 used Nissan Leaf can sell for as low as about \$6,000. Assuming a PEV can be bought  
159 for about \$6,000, or that the incremental costs of a PEV would be \$6,000, Exhibit  
160 RMP\_\_\_(RMM-2SR) shows a simple payback of 10.7 years for charging off-peak on  
161 the Company's proposed option 1 rates and 13.2 years for a rate that is 2.5 cents per  
162 kilowatt hour higher. In other words, an additional 2.5 cents per kilowatt hour could  
163 mean a simple payback period that is about 2.5 years longer. For many customers, the  
164 added cost of tiered rates may keep them from choosing to buy or lease a PEV.

165 **Price Difference between Time Period(s)**

166 **Q. How did the Company select its proposed price differentials between the on- and**  
167 **off-peak periods?**

168 A. The Company first developed Rate Option 2 such that the off-peak energy charge would  
169 be based upon the level of costs from the cost of service study in the last general rate  
170 case that were considered energy-related. By constructing Rate Option 2 in this way,  
171 an off-peak energy charge that is substantially lower than existing residential energy  
172 charges would be used that still covers what the cost of service study indicates as being  
173 energy-related. With setting the off-peak energy rate at this level, the on-peak energy  
174 charge then must be set at a price that is about 10 times higher in order to recover the  
175 revenue requirement.

176 Rate Option 1 was set such that the off-peak energy charge was set halfway  
177 between current average energy charges for residential customers and the off-peak  
178 charge from Rate Option 2. Setting an off-peak energy charge at this level resulted in  
179 an on-peak energy charge that was about three times larger than the off-peak energy  
180 charge. This method of developing prices for Rate Option 1 was used, because the

181 difference between on- and off-peak prices was sufficiently different from Rate Option  
 182 2, as well as, the Company’s current residential time of use tariff Schedule 2. See Table  
 183 1 below for the differences between the on- and off-peak price differential as well as  
 184 the incremental cost to “fuel” a PEV for a Rate Option 1, Rate Option 2, a smaller user  
 185 on Schedule 2, and a larger user on Schedule 2.

186 **Table 1. Time of Use Price Differential and Incremental Cost  
 to “Fuel” a PEV<sup>6</sup> of Different Rate Options**

	Schedule 2		Proposed Schedule 2E	
	Monthly kWh Usage		Rate Option 1	Rate Option 2
	300	3,000		
On-Peak Energy Price (¢ per kWh)	13.2058	17.4784	22.2755	34.3753
Off-Peak Energy Price (¢ per kWh)	7.2164	11.489	6.7881	3.4003
Ratio of On-Off Peak Prices	1.8 : 1	1.5 : 1	3 : 1	10 : 1
<b>Incremental Cost to "Fuel" a PEV</b>	\$35.75	\$42.53	\$24.90	\$12.47

187 As can be seen on Table 1, the price differential between on- and off-peak energy  
 188 charges varies considerably among the Company’s proposed rate options and existing  
 189 Schedule 2. Consequently, Table 1 shows that the potential savings from charging a  
 190 PEV during the off-peak period also varies considerably with the Company’s proposed  
 191 rate options and with Schedule 2.

192 I think that utilizing two options that represent rates which are spread out from  
 193 each other in terms of price differential will yield the most useful information for an  
 194 EV TOU Pilot. Customers respond to price and an EV TOU Pilot is primarily concerned  
 195 with varying price on different time periods. Testing two different extremes with  
 196 respect to price differential will allow the Company to draw a line between both options

<sup>6</sup> The incremental cost to “fuel” a PEV for Table 1 uses the same assumptions as those presented in Revised Exhibit RMP\_\_\_\_(RMM-5).

197 in terms of how they might perform relative to different metrics. What is the typical  
198 retention rate of one option compared to another? How close will Rate Option 1 be to  
199 paying full cost of service relative to Rate Option 2? Might one option encourage PEV  
200 adoption more than another? These are all questions that could be answered by the  
201 Company's proposed pilot. Since what is currently being discussed is a pilot with a  
202 limited duration for a limited number of customers from which useful information is to  
203 be learned, customers are not served by trying to pick at this time a "goldilocks" price  
204 differential that is just right. Rather, including two different extremes for price  
205 differential should be tested and then data-driven conclusions can be made from those  
206 prices to inform a more optimal permanent program.

207 **Q. If only very moderate differentials between on- and off-peak energy charges were**  
208 **tested, what opportunity could be missed?**

209 A. If prices with only very moderate price differentials were tested or if something else  
210 were to be tested with a moderate rate differential, such as the influence of different  
211 periods or of tiers, I think a substantial opportunity would be missed. I think that testing  
212 the price itself will yield the most information and using two differentials that are far  
213 apart from one another will make it easier to draw clear conclusions.

#### 214 **On-Peak Time Period**

215 **Q. Why did the Company propose the time period that it did for on-peak?**

216 A. The Company proposed the time periods for the on- and off-peak period that it did,  
217 because they capture 94 percent of system coincident and distribution coincident  
218 peaks.<sup>7</sup> The purpose of using an on-peak period that aligns with the times of the

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<sup>7</sup> See lines 227 through 239 of Company witness Mr. Robert M. Meredith's Direct Testimony.

219 Company's peaks is to encourage peak demand reductions. Specifically targeting those  
220 times also enables a large differential between prices for usage in both periods to be  
221 based upon cost. The times for the late afternoon/early evening on-peak periods could  
222 be set to 3pm to 7pm for the summer months and 4pm to 8pm for the winter months  
223 with minimal impact to the percentage of peaks captured relative to the Company's  
224 proposed times. The Company instead opted for a consistent 3pm to 8pm for the late  
225 afternoon/early evening on-peak period in both summer and winter months to avoid  
226 customer confusion. For the winter months, the on-peak period includes a two hour  
227 morning period from 8am to 10am, because a significant number of system coincident  
228 peaks occur during those hours.<sup>8</sup>

229 **Q. What value do you think there is in testing other on-peak periods?**

230 A. While testing different on- and off-peak periods could be of some interest, but I do not  
231 think that the timing of the Company's peaks would support time periods that are very  
232 different from those that the Company proposed. Simply testing two similar time  
233 periods would not be as informative as testing price differential.

### 234 **Three Time of Use Periods**

235 **Q. Why does the Company only recommend two time of use periods?**

236 A. Having an option with three time of use periods like UCE originally proposed<sup>9</sup> could  
237 be confusing for customers. Also, having a super off-peak period that has a  
238 substantially lower price than an off-peak period lacks support or any basis in cost.<sup>10</sup>

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<sup>8</sup> See Exhibit RMP\_\_\_(RMM-3).

<sup>9</sup> See lines 309 through 392 of UCE witness Ms. Sarah Wright's Direct Testimony.

<sup>10</sup> See lines 624 through 653 of Company witness Mr. Robert M. Meredith's Rebuttal Testimony.

239 Using the two time of use periods recommended by the Company is supportable and  
240 easier for customers to understand.

241 **Conclusion**

242 **Q. Please summarize your surrebuttal testimony.**

243 A. The Company's proposed EV TOU Pilot, which includes plans to evaluate two rate  
244 options that are the same in all ways except for price differential, will yield the most  
245 useful information relating to customers with PEVs and potential time of use pricing.  
246 Alternatives to the Company's proposed rate options that would test energy price tiers  
247 or different time periods would not provide information that is as useful for ratepayers.

248 **Q. What is your recommendation for the Commission?**

249 A. The Company recommends that the Commission approve the Company's proposed EV  
250 TOU Pilot as modified in my rebuttal testimony along with its proposed Schedule 2E  
251 and Schedule 121.

252 **Q. Does this conclude your surrebuttal testimony?**

253 A. Yes.