

**BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH**

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<b>Application of Rocky</b>	)	<b>DOCKET NO. 17-035-61</b>
<b>Mountain Power to</b>	)	<b>Exhibit No. DPU 2.0 R PH-I</b>
<b>Establish Export Credits for</b>	)	
<b>Customer Generated</b>	)	<b>Rebuttal Testimony of</b>
<b>Electricity</b>	)	<b>Charles E. Peterson</b>
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**THE DIVISION OF PUBLIC UTILITIES  
DEPARTMENT OF COMMERCE  
STATE OF UTAH**

**Rebuttal Testimony – Phase One**

**of**

**Charles E. Peterson**

**April 10, 2018**

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**Rebuttal Testimony of Charles E. Peterson—Phase One**

**I. INTRODUCTION**

**Q. Please state your name, business address and title.**

A. My name is Charles E. Peterson. My business address is 160 East 300 South, Salt Lake City, Utah 84114. I am a Technical Consultant in the Utah Division of Public Utilities (Division, or DPU).

**Q. On whose behalf are you testifying?**

A. The Division.

**Q. Did you previously file direct testimony in this matter?**

A. Yes.

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

A. I briefly comment on some of the points made by Ms. Kate Bowman, witness for Utah Clean Energy; Mr. Christopher Worley, witness for Vivint Solar, Inc.; and Mr. Rick Gilliam witness for Vote Solar (collectively referred to as the “intervenor witnesses”). Generally I comment on the sample size and design study issues raised by these witnesses regarding the proposed research by Rocky Mountain Power (Company) of its grandfathered rooftop solar customers.

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26 Any positions or issues of these intervenor witnesses that I do not address should not be  
27 construed as agreement or disagreement with those positions.

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29

30 **II. CRITICISMS OF PROPOSED SAMPLE DESIGN AND SAMPLE SIZE**

31

32 **Q. Please summarize what the Company is proposing in its load research study of its**  
33 **Schedule 135 customers; i.e. its grandfathered roof top solar customers.**

34 A. The sample design is a two stage design wherein the first stage is to stratify the target  
35 population into four strata. The next stage is to perform a systematic random sample within  
36 each strata in order to assure that there is coverage of the range of values within each strata.  
37 In determining a sample size, the Company has selected a confidence level of 95 percent at a  
38 precision of plus or minus 10 percent. Given these parameters, a sample size of 54 was  
39 determined. The Company is repurposing the sample of 36 customers that was studied in  
40 Docket No. 14-035-114 to be part of the sample in this docket. This results in an over-  
41 sampling of strata 1 (the strata with the smallest system sizes) by 16, resulting in an overall  
42 sample size of 70 spread across four strata based on system size.

43

44 As discussed in my direct testimony, the Division believes that this sample design is  
45 reasonable and should give information on the average net system impacts of these Schedule  
46 135 customers, within the selected precision and confidence levels.

47

48 **Q. What are the principal criticisms of the intervenor witnesses to the Company’s**  
49 **proposal?**

50 A. As they relate to the sampling design and sample size, the intervening witnesses offer similar  
51 criticisms. Ms. Bowman’s criticisms, which are broadly representative of the other two  
52 witnesses as well, include that the Company’s proposal fails to adequately research the  
53 “orientation, tilt, and shading of each solar installation;” the Company’s proposal will not  
54 provide the data she wants, i.e. “information that characterizes Load Research Study  
55 customers’ energy usage” by which she means gathering information about each customer’s  
56 possession and usage of various appliances “including (but not limited to) whether the  
57 customer has air conditioning, evaporative cooling, an electric vehicle, LED lighting, battery  
58 storage, smart thermostats, or other relevant appliances or devices;”<sup>1</sup> and she claims that the  
59 Company’s proposal will not provide “relevant information about the Load Research Study  
60 customers’ location on the distribution system;” she believes that “residential and  
61 commercial customers should be sampled and stratified separately;” and finally that “Load  
62 Research Study customers should be stratified based on total energy usage, not system  
63 size....”<sup>2</sup>

64  
65 **Q. Does Mr. Worley have recommendations and criticisms that are additional to those by**  
66 **Ms. Bowman you outlined above?**

67 A. Yes. Mr. Worley adds some recommendations that include that the Company use simple  
68 random sampling rather than stratified sampling; “sampling based on RMP’s distribution

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<sup>1</sup> Direct Testimony of Kate Bowman for UCE, page 17, lines 240-242.

<sup>2</sup> Ibid., page 10, lines 104-107 and 111-113.

69 system topology rather than county-level sampling; and collecting generation, load, and  
70 export data from study participants rather than generation from some and load and export  
71 data from others.”<sup>3</sup>

72  
73 Mr. Worley also proposes that, in order to save money, the Company should select from  
74 what he claims are revenue grade meters he found for sale on the internet that should cost  
75 significantly less money than what the Company is proposing to use and are “roughly the  
76 size of a coffee can.”<sup>4</sup> He further claims that it should take an electrician four hours to install  
77 these meters, although he does not directly state an installation cost.<sup>5</sup>

78  
79 As an alternative to using the Company’s proposed revenue grade meters, or the less  
80 expensive meters he suggested, Mr. Worley says that the Company could acquire inverter  
81 data from system installers once the appropriate permissions are obtained. Although Mr.  
82 Worley admits that data from this source is much less accurate (+/- 5.0 percent versus +/- 0.2  
83 percent for the revenue-grade meters), he opines that this would not affect the accuracy of the  
84 Company’s proposal since it will only be accurate to +/- 10 percent.<sup>6</sup>

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<sup>3</sup> Direct Testimony of Christopher Worley, page 1, lines 19-23.

<sup>4</sup> Ibid., page 6, lines 118-127.

<sup>5</sup> Ibid., page 7, lines 130-131.

<sup>6</sup> Ibid., page 7, lines 132-145.

88 **Q. Does Mr. Gilliam have recommendations that are additional to those by Ms. Bowman**  
89 **and Mr. Worley outlined above?**

90 Yes. Mr. Gilliam asserts that "...because grandfathered customers installed their systems  
91 under a different set of economic conditions from transition customers, data from each group  
92 should remain separated...other electrical devices on customer premises can impact both the  
93 timing and magnitude of net exports and should be documented as part of the research plan."<sup>7</sup>  
94 He suggests that "RMP should retain, and make available, usage data for the sampled  
95 transition customers for a minimum of twelve months prior to the installation of the rooftop  
96 solar system. This will allow comparisons of before and after total consumption patterns and  
97 will help identify changes that may have occurred due to changed incentives."<sup>8</sup> Finally, he  
98 admits that there are added costs associated with his requests.<sup>9</sup>

99

100

101 **III. RESPONSE TO INTERVENOR CRITICISMS OF THE COMPANY'S**  
102 **RESEARCH PROPOSAL.**

103

104 **Q. Please summarize your response to the intervenor witnesses' criticisms of the**  
105 **Company's research proposal?**

106 A. The issues boil down to "how many different ways do you need to characterize Schedule 135  
107 customers and then collect data on those characteristics?" and "how much ratepayers' money  
108 are you willing to spend?" The Division does not believe the range of data requested by the

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<sup>7</sup> Direct Testimony of Rick Gilliam, page 12, lines 213-217.

<sup>8</sup> Ibid., page 21, lines 369-372.

<sup>9</sup> Ibid., pages 26-27, lines 482-484.

109 intervenor witnesses is necessary to determine a reasonable amount for the export credit,  
110 which is the ultimate purpose of this study. With respect to sample size issues, the Division  
111 notes that additional information will be gathered from transition customers who sign up this  
112 year, which will supplement the statistical study of Schedule 135 customers.

113

114 **Q. Have the intervenor witnesses quantified the sample sizes they think will be necessary to**  
115 **adequately gather the data they want?**

116 A. Mr. Worley claims that his proposed simple random sample would require a sample size of  
117 379.<sup>10</sup> Mr. Worley does not show how he arrived at that number. This number conflicts with  
118 the Company's estimate of 2,927 found in Workshop Attachment 11. While the Company  
119 had difficulty getting the original 36 participants for the Docket No. 14-035-114 load  
120 research study, assuming Mr. Worley's number is correct, obtaining a sample size of 379,  
121 while more costly than the Company's proposal, should be easier given the requirement of  
122 Schedule 135 customers to participate in load research studies.<sup>11</sup>

123

124 **Q. Have the intervenor witnesses proposed a budget that the Company should have in**  
125 **order to implement intervenor's research proposals?**

126 A. No.

127

128

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<sup>10</sup> Worley, page 13, line 257.

<sup>11</sup> Electric Service Schedule No. 135, paragraph 10.



129 **Q. Generally, what do you believe the effects of implementing the intervenor witnesses’**  
130 **proposals will be?**

131 A. Implementing the intervenor witnesses’ proposals will greatly expand the scope, complexity,  
132 and cost of the Company’s studies, which I understand ultimately will be paid for by  
133 ratepayers. The intervenor witnesses leave the budget aspect of the study open-ended (which  
134 is always a factor in any study). This allows them to give “the sky’s the limit” wish lists. If  
135 the Commission gives consideration to a study expansion beyond the Company’s proposal, it  
136 should, at a minimum, set the budgetary limits first and then determine what can be done  
137 within that budget.

138  
139 The “wish lists” of the intervenor witnesses, in principle, could be satisfied with much larger  
140 samples and their concurrent higher costs, perhaps with some adjustments to survey designs.  
141 Again, as explained further in Division witness Mr. Robert Davis’ rebuttal testimony, the  
142 Division does not believe this information is necessary for the purpose of this docket and that  
143 the intervenor witnesses have failed to demonstrate the necessity of gathering the additional  
144 data.

145  
146 **Q. But didn’t you mention earlier that Mr. Worley made a proposal to use cheaper**  
147 **revenue-grade meters that he found on the internet, or, alternatively, use inverter data,**  
148 **to mitigate the costs?**

149 A. Yes. Mr. Worley’s proposal could reduce some costs, perhaps significantly. The Division  
150 would support Mr. Worley’s proposal of using less expensive meters and four hours of an  
151 electricians’ time if Mr. Worley’s suggestion could be proven to work and save money. Such

152 cost savings could be directed to, for example, an increase in the sample size that could  
153 improve the precision of the sample data. However, the Division understands that there are  
154 additional cost implications related to interfacing Mr. Worley's proposed equipment with the  
155 Company's system generally, which may eliminate any cost savings. Mr. Davis comments  
156 further on this latter point.

157  
158 Mr. Worley's alternative suggestion to use inverter data is more problematic. It is not clear  
159 that that data could be obtained and audited. Furthermore, I disagree with his statement that  
160 decreasing the reliability of the data by 25 times has no implications on the sample size and  
161 the precision of the study (+/- 5.0 percent for the inverter data vs. +/- 0.2 percent for revenue-  
162 grade meters, or 25 times lower precision than the Company's equipment).<sup>12</sup> Mr. Worley's  
163 claim needs more support than just asserting that plus or minus 5 percent is less than plus or  
164 minus 10 percent.

165  
166 Significantly increasing the variability via less reliable data will increase the sample  
167 variance, which in turn would, by itself, increase the needed sample size to meet whatever  
168 confidence and precision criteria is desired. The larger sample size would offset some of the  
169 cost savings by using inverter data.

170

171 **Q. Do you have responses to Mr. Gilliam's comments that you cited above?**

172 A. While I don't find it necessarily inappropriate to consider the data from the grandfathered  
173 customers' survey and the transition customers together, those data should be available

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<sup>12</sup> See Worley, page 7, lines 141-145.

174 separately as well for separate analysis and comparison. Likewise, if available, it is  
175 reasonable to have for comparison and analysis the “before and after” data on the transition  
176 customers.

177

#### 178 **IV. CONCLUSIONS AND RECOMMENDATIONS**

179

##### 180 **Q. What are your conclusions and recommendations to the Commission?**

181 A. The Division continues to believe that the Company’s sample design is reasonable and is  
182 expected to yield the average net impact on the Company’s system in Utah of the Schedule  
183 135 grandfathered customers at the expected confidence level and precision of the sample  
184 size and design. If the Commission desires more precision, it will come at the price of a  
185 much larger sample size and higher costs. If the Commission expects that additional  
186 characteristics of the grandfathered customers should be measured at reasonable confidence  
187 and precision levels as suggested by the intervenor witnesses, then the sample size will have  
188 to be greatly increased with a concurrent increase in the cost of the study. These additional  
189 costs will ultimately be borne by Utah ratepayers.

190

191 The increased variance that would likely be introduced with the suggestion that inverter data  
192 might be obtainable and used, will also require an increased sample size. While there might  
193 be cost savings associated with the meter equipment proposed by Mr. Worley, the Division  
194 understands that there would be additional costs placed on the Company’s system that could  
195 reduce or eliminate any cost advantages associated with Mr. Worley’s proposals.

196

197 As discussed in detail by Mr. Davis, the Division continues to believe that the sample size  
198 and study design proposed by Company is reasonable and will likely obtain the required  
199 information needed from the study at the specified confidence and precision levels.

200

201 **Q. Does that conclude your rebuttal testimony?**

202 A. Yes.