

BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

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| |) | |
| |) | Docket No. 17-035-61 Phase II |
| In the Matter of the Application of |) | |
| Rocky Mountain Power to |) | Surrebuttal Testimony |
| Establish Export Credits for |) | of Philip Hayet |
| Customer Generated Electricity |) | On behalf of the |
| |) | Office of Consumer Services |
| |) | (Corrected Version) |

Corrected (Red Line) Version:

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1 **Introduction and Summary of Positions**

2 **Q. WHAT IS YOUR NAME, OCCUPATION AND BUSINESS ADDRESS?**

3 A. My name is Philip Hayet and I am a Vice President and Principal of J. Kennedy
4 and Associates, Inc. (“Kennedy and Associates”). My business address is 570
5 Colonial Park Drive, Suite 305, Roswell, Georgia, 30075.

6 **Q. HAVE YOU PREVIOUSLY FILED TESTIMONY IN THIS CASE?**

7 A. Yes, I filed rebuttal testimony on July 15, 2020.

8 **Q. WHAT IS THE PURPOSE OF YOUR SURREBUTTAL TESTIMONY?**

9 A. I respond to some of the issues that Rocky Mountain Power (“RMP”) witness
10 Daniel MacNeil raised in his rebuttal testimony related to the RMP’s proposed
11 calculation of avoided energy costs and the overall Export Credit Rate (“ECR”).

12 I also respond to certain issues that Vote Solar witnesses Dr. Michael
13 Milligan and Dr. Albert Lee addressed in their respective rebuttal testimonies.
14 Finally, I respond to issues raised by Dr. Christopher Worley in his rebuttal
15 testimony on behalf of Vivint Solar.

16 **Q. AS A PRELIMINARY MATTER, HAVE YOU MODIFIED ANY OF YOUR**
17 **POSITIONS SINCE YOU FILED REBUTTAL TESTIMONY?**

18 A. Yes, I have. As I will discuss below, after having considered RMP and intervenor
19 rebuttal testimony, I now believe the Energy Imbalance Market (“EIM”) could be
20 used as part of a method for developing avoided energy costs for the ECR. While
21 I still believe there are desirable reasons for using a GRID or Aurora modeling
22 approach, I would agree that for short-term avoided energy costs (in this case one
23 year), it would be reasonable to use actual EIM price data to calculate avoided

24 energy costs for the ECR. I would also agree with RMP witness MacNeil and
25 Vivint witness Worley that the use of EIM data to calculate the ECR would most
26 likely avoid the kind of controversies that sometimes arise when models are
27 employed to develop avoided energy costs. However, I would stress, that this
28 position is dependent on the PSC adopting a single year ECR calculation approach
29 with annual updates, rather than adopting a long-term levelized ECR calculation
30 approach, as advocated by Vote Solar, Vivint and other parties. For a long-term
31 projection of avoided energy costs, clearly a modeling approach using GRID or
32 Aurora would be more preferable.

33 In addition, though I do not agree unconditionally with the notion of
34 including a long-term, levelized avoided capacity cost component in the ECR as
35 advocated by Vote Solar, Vivint and Utah Clean Energy (“UCE”), I do
36 acknowledge that rooftop solar exported customer generation (“CG”) could
37 possibly avoid some small amount of generation capacity cost. In other words, I
38 accept the notion that the avoided generation capacity cost associated with solar
39 exported CG may have a non-zero value. While I would not be opposed to
40 including some small, avoided generation capacity cost value in the ECR, I
41 continue to oppose a full long-term levelized generation capacity cost component
42 for the reasons that I discussed in my rebuttal testimony. Furthermore, I do not
43 believe that any of the parties in this proceeding who have advocated for the
44 inclusion of such an avoided generation capacity cost component (Vote Solar,
45 Vivint and UCE) have met their burden of proof in offering a reasonable value that
46 could be relied on.

47

48 **Response to RMP Witness Daniel MacNeil**

49 **Q. RMP WITNESS MACNEIL ADDRESSES VIVINT SOLAR WITNESS**
50 **WORLEY'S PROPOSAL TO CALCULATE AVOIDED ENERGY COSTS**
51 **BASED ON EIM DATA. WHAT IS YOUR RESPONSE TO MR.**
52 **MACNEIL'S TESTIMONY ON THIS ISSUE?**

53 A. In his rebuttal to Dr. Worley, Mr. MacNeil discusses his willingness to adopt
54 Vivint's recommendation to use EIM data to calculate avoided energy costs.
55 However, Mr. MacNeil points out what he considers to be flaws in Dr. Worley's
56 specific approach and offers three corrections that would make use of an EIM
57 approach acceptable to RMP. As I mentioned above, I have considered RMP and
58 Dr. Worley's rebuttal testimony concerning this matter, and I am also willing to
59 adopt Dr. Worley's recommendations, but with similar conditions to those RMP
60 identified.

61 **Q. WHAT ARE THE CONDITIONS THAT WOULD MAKE AN EIM**
62 **APPROACH ACCEPTABLE TO YOU?**

63 A. First, I agree with Mr. MacNeil that Dr. Worley's calculation using a simple
64 average of EIM prices over the period of 9:00 am to 7:00 pm and then averaging
65 those values across the twelve months of the year is not the way that EIM prices
66 should be used in the avoided energy cost calculation. Hours with high cost EIM
67 prices could drag up the simple average EIM price calculation, yet the pattern of
68 exported CG may not correlate well with the high cost EIM hours and therefore the
69 simple average approach would overstate the avoided energy cost value. A better

70 approach would be to match EIM prices to exported CG in the same time periods.
71 At present, historic load research data could be used for this purpose, though in the
72 future this data should be updated using actual Schedule 137 customer usage data.
73 This way, time differentiated EIM prices would be used to derive avoided energy
74 costs to price exported CG.

75 **Q. WHAT ARE THE OTHER CONDITIONS THAT YOU RECOMMEND?**

76 A. The second condition is that the Utah nodal EIM prices should not be adjusted to
77 remove the greenhouse gas, congestion, and line loss adders, as Mr. Worley has
78 proposed. I agree with RMP that these should remain a part of the EIM prices used
79 in the avoided energy cost calculation. The greenhouse gas adder is in fact a
80 negative value at the Salt Lake City node because greenhouse gas values are added
81 in for CAISO market participants but removed for EIM customers outside of the
82 CAISO. Since Utah does not have a greenhouse gas requirement like California, a
83 negative Greenhouse Gas adder should be part of the EIM price used to compute
84 the avoided energy costs. Likewise, the congestion and line loss adders are
85 necessary to derive the appropriate EIM price at the Salt Lake City node and should
86 not be removed as Mr. Worley recommends. Because of congestion and losses,
87 hourly nodal EIM prices are differentiated by location, and it would be
88 inappropriate to remove the components of the EIM prices that cause the nodal EIM
89 prices to be different throughout the EIM market.

90 **Q. ARE THERE ANY OTHER ADJUSTMENTS TO DR. WORLEY'S EIM**
91 **BASED AVOIDED ENERGY COST CALCULATION THAT SHOULD BE**
92 **MADE?**

93 A. Yes, Mr. MacNeil notes that Dr. Worley did not account for integration costs and
94 did not fully account for avoided line losses as he had intended. Regarding
95 integration costs, in my rebuttal testimony, I found RMP's proposed amount of
96 \$0.15/MWh, determined in RMP's most recent Flexible Reserves Study and
97 presented in the 2019 IRP, to be acceptable and I found that it was a fairly small
98 cost component of the overall avoided energy cost calculation. I continue to
99 recommend that it be included as a reduction to the avoided energy cost calculation.

100 **Q. PLEASE EXPLAIN THE LINE LOSS ADJUSTMENT THAT RMP**
101 **RECOMMENDS BE APPLIED TO VIVINT'S EIM BASED AVOIDED**
102 **ENERGY COST CALCULATION.**

103 A. As mentioned above, Dr. Worley recognized that avoided line losses should be
104 included as a component of the energy cost calculation, however he assumed that
105 by removing the EIM line loss component (a negative value) he was in effect adding
106 back in an appropriate amount for avoided line losses. This is not the case, as the
107 EIM line loss component is a marginal line loss value that accounts for losses
108 between different points on the transmission system and would not account for the
109 line loss benefit that exported CG provides. As mentioned, along with the
110 congestion cost component, the line loss component is a necessary part of the
111 calculation that allows EIM prices to be differentiated by location across the EIM
112 market.

113 I agree with RMP that additional avoided line loss value should be included
114 in the avoided energy cost calculation. However, as I discussed in my rebuttal
115 testimony, I recommend that secondary line losses should be accounted for in

116 addition to the line losses that RMP recommends. ~~At line 506 of my rebuttal~~
117 ~~testimony, I indicated that t~~The inclusion of secondary lines losses would add
118 approximately \$0.~~2843~~/MWh to RMP's avoided energy cost.

119 **Q. WHAT IS YOUR ESTIMATE OF AVOIDED ENERGY COSTS BASED ON**
120 **THE EIM APPROACH?**

121 A. Assuming the PSC adopts RMP's exported CG profile that it derived based on its
122 load research study, then my estimate of avoided energy cost using an EIM
123 calculation is the same as Mr. MacNeil's, but with the addition of \$0.~~2843~~/MWh
124 to include secondary line losses. Mr. MacNeil's analysis produces an avoided
125 energy cost of \$22.09/MWh for 2021, and with the addition of \$0.~~2843~~/MWh, the
126 avoided energy cost that I recommend is \$22.~~3752~~/MWh. This amount is
127 \$4.~~6580~~/MWh greater than the avoided energy cost I proposed in my rebuttal
128 testimony that was based on a GRID approach (\$17.72/MWh), and is \$7.~~4126~~
129 greater than the avoided energy cost that RMP proposed in its rebuttal testimony
130 using its GRID approach (\$15.26/MWh).¹

131 **Q. DOES MR. MACNEIL OFFER ANY INSIGHT TO EXPLAIN WHY THE**
132 **GRID BASED AVOIDED ENERGY COSTS ARE LOWER THAN THE EIM**
133 **DERIVED AVOIDED ENERGY COSTS?**

134 A. Yes. Mr. MacNeil believes the difference is predominantly attributable to the fact
135 that 459 MW of new solar resource additions will have been added to the system
136 just prior to 2021, and therefore PacifiCorp reflected that zero cost renewable
137 capacity in the GRID study performed for the 2021 test period. However, that solar

¹ See Hayet rebuttal testimony at ln. 763.

138 capacity was not part of the System during the 12-month ended period of September
139 2019, and therefore, did not affect the EIM results that were collected during that
140 period. Thus, according to Mr. MacNeil, the additional solar capacity impacted the
141 GRID test period results but had no effect on the EIM results. Mr. MacNeil
142 contends that in the future, the EIM results will reflect the additional solar
143 resources, which will cause the EIM derived avoided energy costs to decline similar
144 to what occurred in GRID.

145 **Q. YOU NOTED THAT YOUR ORIGINAL GRID BASED ESTIMATE WAS**
146 **\$17.72/MWH, WHILE RMP'S ORIGINAL GRID BASED ESTIMATE WAS**
147 **\$15.26/MWH, WHAT ACCOUNTED FOR THE DIFFERENCE IN THE**
148 **TWO ESTIMATES?**

149 A. As I discussed in my rebuttal testimony, RMP included market cap constraints in
150 its GRID modeling during both high load hours (“HLH”) and low load hours
151 (“LLH”) to limit the amount of coal-fired generation that would be used to make
152 economic sales to the market hubs. As the PSC originally only expected that market
153 caps would be used to limit market sales during LLHs, I removed market caps from
154 all markets during HLHs in my GRID runs, which resulted in an avoided energy
155 cost that was \$2.46/MWh (17.72 – 15.26) higher than what RMP determined.

156 Because of the market cap constraint, it is clear that Mr. MacNeil's
157 explanation (i.e. that additional solar energy is the reason why the GRID derived
158 avoided energy cost estimate is \$7.~~4~~26/MWh lower than the EIM derived
159 estimate) does not fully explain the difference. More than \$2 of the difference

160 (\$7.~~1126~~ - \$4.~~6580~~ = 2.46)² is due to PacifiCorp's market cap constraint that I
161 recommended should be removed from the database if GRID is used to derive the
162 estimate of avoided energy costs.³

163 **Q. PLEASE SUMMARIZE YOUR POSITION REGARDING THE**
164 **CALCULATION OF AVOIDED ENERGY COSTS IN THIS**
165 **PROCEEDING.**

166 A. I continue to support the use of GRID to perform projections of production costs
167 and to develop avoided energy costs. However, RMP is transitioning to the Aurora
168 model, and eventually I expect that Aurora would be used to perform these
169 functions. This adds some complications to the continued use of GRID to calculate
170 avoided energy costs for ECR purposes. As discussed above, I am also receptive
171 to using an EIM based approach to develop avoided energy costs, as long as it is
172 only used to project forward for one year, which would require it to be updated
173 annually to reflect the most current conditions possible. Clearly, the ease of
174 calculating and reviewing avoided energy costs derived from historical EIM data,
175 and the reduction in areas of potential controversies are points in its favor.
176 Moreover, because the avoided cost calculation used in the ECR would only be for
177 one year forward, as I have recommended, the use of recent, historic EIM data
178 rather than a production cost projection may be reasonable. In conclusion, while
179 the OCS continues to support the use of the GRID model to calculate avoided
180 energy costs, the OCS would not object to the use of the EIM as the basis for

² \$0.28/MWh of the difference is also due to Mr. Hayet's inclusion of secondary line losses in his avoided line loss calculation.

³ See Hayet rebuttal testimony at ln. 763.

181 calculating avoided energy costs with the conditions that I have discussed. This
182 appears to be the same position that RMP has adopted as well.⁴

183 **Q. MR. MACNEIL RESPONDS TO DR. MILLIGAN AND DR. WORLEY ON**
184 **THEIR RESPECTIVE TESTIMONIES SUPPORTING THE INCLUSION**
185 **OF A GENERATION CAPACITY CREDIT IN THE ECR. WHAT IS YOUR**
186 **RESPONSE TO HIS TESTIMONY ON THIS ISSUE?**

187 A. I generally agree with Mr. MacNeil in not wanting to include an avoided generation
188 capacity cost component in the ECR. Mr. MacNeil specifically addresses the Vote
189 Solar and Vivint derivation of solar capacity values, which form the basis for
190 measuring avoided generation capacity cost. My main concern with including an
191 avoided generation capacity cost component in the ECR, however, is that the solar
192 capacity, regardless of the capacity value percentage, is not subject to any long-
193 term commitment by the exported CG customer. In addition, the exported
194 “capacity” is the amount left over, after the CG customer’s own usage. These two
195 factors create additional risk that is not captured in the capacity value adjustment
196 presented by Vote Solar. The fact that the capacity value percentage is applied to
197 an export energy load profile does not reflect this risk. However, notwithstanding
198 this increased risk, the OCS acknowledges that there may be some small non-zero
199 avoided generation capacity value associated with exported CG. I acknowledged
200 this in my rebuttal testimony, in which I stated,⁵

⁴ At line 138 of his rebuttal testimony, Mr. MacNeil supports the use of EIM data, however, in his concluding remarks at line 1238 of the same testimony, Mr. MacNeil reiterates RMP’s support for the export credit rates and structure that it presented in its initial application filing, which were derived using the GRID model.

⁵ Philip Hayet rebuttal testimony, at ln. 583.

201 “...the OCS’ primary recommendation is not to include an avoided
202 generation capacity cost component for the reasons I described above.
203 However, there is one reason that possibly supports the inclusion of an
204 avoided generation capacity cost component and mitigates the risks of
205 solar generation as mentioned above. The reason is that generation
206 capacity, as opposed to transmission and distribution capacity, is a
207 product that can be readily acquired from the market. For planning
208 purposes, RMP relies on the notion that short term capacity purchases can
209 be obtained from the market. In fact, PacifiCorp’s 2019 IRP action plan
210 includes an action item that notes steps it has to take to in order to acquire
211 market capacity purchases. If PacifiCorp had reason to believe that
212 capacity would not materialize, it could arrange for a short term firm
213 purchase in accordance with its Front Office Procedures and Practices.
214 [footnote reference removed]

215
216 The OCS’s position, as discussed beginning at line 595 of my rebuttal
217 testimony, is that if an avoided generation capacity cost component is included, it
218 should be included at a discounted percentage of the Vote Solar calculation –
219 somewhere in the range of 25% to 50% of the calculated value.

220

221 **Response to Vote Solar Witness Dr. Michael Milligan**

222 **Q. DR. MILLIGAN RESPONDS TO RMP’S CALCULATION OF AVOIDED**
223 **ENERGY COST. DO YOU HAVE ANY RESPONSE TO HIS REBUTTAL**
224 **TESTIMONY ON THIS ISSUE?**

225 A. Yes. Dr. Milligan criticizes RMP’s avoided energy cost analysis because the GRID
226 database “bakes-in” resources that are dictated by the IRP, meaning RMP assumes
227 resources “that are anticipated but not yet built, will be developed and deployed
228 ahead of existing CG.”⁶ While this argument could have some merit for a long run
229 GRID analysis, it is not relevant for determining avoided energy on a one-year in

⁶ Michael Milligan rebuttal testimony at ln. 116.

230 advance basis, which is what RMP proposes and the OCS supports for use in this
231 ECR proceeding.

232 **Q. DR. MILLIGAN ASSERTS AT LINE 251 OF HIS REBUTTAL**
233 **TESTIMONY THAT “RMP’S INTENT TO ABANDON THE GRID MODEL**
234 **SHOWS THAT IT HAS A LACK OF CONFIDENCE” IN THAT MODEL.**
235 **IS IT YOUR UNDERSTANDING THAT PACIFICORP IS PLANNING TO**
236 **SWITCH TO ANOTHER MODEL BECAUSE IT HAS A LACK OF**
237 **CONFIDENCE IN GRID?**

238 **A.** No, it is not. All models have their advantages and disadvantages and certainly one
239 of the greatest advantages of the GRID model is that it has been custom designed
240 by PacifiCorp to include very specific modeling features to properly simulate the
241 PacifiCorp system in a production cost analysis. It is my understanding that
242 PacifiCorp is planning to switch to Aurora, not because of a lack of confidence in
243 GRID, but because PacifiCorp desires to use a nodal pricing model as part of the
244 new 2020 PacifiCorp Inter-Jurisdictional Allocation Protocol (“2020 Protocol”)
245 that “PacifiCorp and more than 20 government agencies, customer associations,
246 conservation groups, and individual large customers have signed, which addresses
247 interjurisdictional cost allocation.”⁷ The Aurora model will allow PacifiCorp to
248 allocate production costs hourly to the different states using a nodal pricing
249 methodology, which does not exist in GRID. I do agree that when GRID is replaced
250 by Aurora, the avoided energy cost analysis should be performed using Aurora.

⁷ PSC Order issued April 15, 2020 approving the 2020 Protocol, Docket No. 19-035-42, at pg. 1.

251 **Q. DR. MILLIGAN ARGUES THAT INTEGRATION COSTS SHOULD NOT**
252 **BE APPLIED TO WIND AND SOLAR RESOURCES. DO YOU CONTINUE**
253 **TO SUPPORT THE INCLUSION OF INTEGRATION COSTS AS AN**
254 **OFFSET TO AVOIDED ENERGY COST IN THE ECR?**

255 A. Yes, for the reasons that I discussed in my rebuttal testimony and as I discussed
256 earlier in this testimony. It is important to recognize that RMP's integration cost
257 offset amounts to \$0.15/MWh out of a total OCS GRID based ECR value of
258 \$17.72/MWh and a Vote Solar ECR of \$222/MWh. While RMP's proposed
259 integration cost is relatively small, it is important to include the cost component as
260 integration costs could change over time.

261

262 **Response to Vote Solar Witness Dr. Albert Lee**

263 **Q. DR. LEE PRESENTS AN ANALYSIS COMPARING CUSTOMER FEES TO**
264 **THE EXPORT CREDIT THAT THE AVERAGE CUSTOMER COULD**
265 **EXPECT TO RECEIVE IF RMP'S PROPOSED ECR IS APPROVED. HE**
266 **CONCLUDES THAT EXPORTED CG CUSTOMER'S WOULD NOT**
267 **BEGIN TO RECEIVE NET ECONOMIC BENEFITS FROM THEIR CG**
268 **INVESTMENTS UNTIL THE FOURTH YEAR OF OPERATION. DO YOU**
269 **AGREE WITH HIS CONCLUSION?**

270 A. No. Dr. Lee asserts that each average CG customer would receive \$94 in credits
271 per year and would incur \$310 in initial fees (\$150 application fee and \$160
272 metering fee). Thus, Dr. Lee claims that exported CG customers would not break

273 even, taking service under Schedule 137, until the fourth year of operation.⁸ The
274 problem with this is that Dr. Lee's analysis completely ignores the economic benefit
275 that a CG customer receives through the offset of the customer's own usage from
276 CG solar energy. Under the Schedule 137 proposal, CG customers will avoid
277 paying for the portion of RMP's fixed costs that are ordinarily paid through energy
278 rates during those hours in which CG energy serves the customer's own load. These
279 costs will still have to be paid, and essentially, non-participating customers will pay
280 those costs. While this was deemed to be an acceptable compromise that was
281 approved by all parties who signed the comprehensive Settlement Stipulation on
282 August 28, 2017, for many of the parties that was only because they assumed that
283 a reasonable estimate of the ECR would ultimately be established, and Vote Solar's
284 \$222/MWh proposed ECR is far from reasonable. Dr. Lee's break-even argument
285 should be ignored by the PSC in its consideration of RMP's ECR proposal.

286

287 **Response to Vivint Witness Dr. Christopher Worley**

288 **Q. AS YOU DISCUSSED EARLIER IN YOUR TESTIMONY, DR. WORLEY**
289 **SUPPORTS THE INCLUSION OF AVOIDED GENERATION CAPACITY**
290 **COSTS IN HIS TESTIMONY AND RECOMMENDS THAT THE PSC**
291 **ADOPT THE VOTE SOLAR AVOIDED GENERATION CAPACITY COST**
292 **CALCULATION. DO YOU HAVE ANY ADDITIONAL COMMENTS ON**
293 **HIS TESTIMONY IN THIS REGARD?**

⁸ Albert Lee rebuttal testimony, Table 3, at ln. 337.

294 A. Yes. Dr. Worley appears to be arguing that RMP excluded long run marginal costs
295 (avoided generation capacity costs) from the ECR because CG is an intermittent
296 resource. While solar generation, whether in the form of central station solar
297 facilities or rooftop CG is an intermittent resource, I would emphasize once again
298 that this is not the primary basis that the OCS recommends the exclusion of avoided
299 generation capacity costs from the ECR. As I discussed previously, CG capacity is
300 not subject to any long-term commitment from CG customers, and there is
301 increased risk of export CG being available, relative to central station solar
302 generation, because CG customers use CG first to offset their own energy usage
303 before exporting energy to the grid. The imposition of a customer's own energy
304 usage profile on the solar output profile creates a higher risk to the resulting
305 exported energy profile than would be the case with traditional utility scale solar
306 energy. As I discussed earlier, I believe that this reduces the capacity value of CG.
307 Notwithstanding this, I would still accept the notion that the capacity benefit is
308 likely a non-zero small value. However, as I mentioned earlier, I do not believe
309 that any of the parties in this proceeding, including Vivint have met their burden of
310 proof in offering a reasonable value that should be relied on.

311 **Q. DOES THIS COMPLETE YOUR REBUTTAL TESTIMONY?**

312 A. Yes, it does.