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BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

In the Matter of the Application of Rocky Mountain Power to Establish Export Credits for Customer Generated Electricity	**Docket No. 17-035-61 Phase 2**

REBUTTAL TESTIMONY OF SACHU CONSTANTINE

ON BEHALF OF

VOTE SOLAR

July 15, 2020

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I. INTRODUCTION

1

Q. Please state your name and business address.

2

A. My name is Sachu Constantine. My business address is 360 22nd Street, Suite 730, Oakland, California 94612.

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4

Q. On whose behalf are you submitting this rebuttal testimony?

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A. I am submitting this rebuttal testimony on behalf of Vote Solar.

6

Q. Please provide an overview of your educational and professional experience.

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A. A detailed overview of my educational and professional experience can be found in my Revised Affirmative Testimony filed May 8, 2020.[1]

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Q. By whom are you employed and in what capacity?

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A. I serve as Managing Director, Regulatory for Vote Solar. I manage the full regulatory team for Vote Solar and analyze the development and implementation of policy initiatives related to distributed solar generation. My team is responsible for evaluating utility cost-of-service studies, revenue allocation and ratemaking, resource planning and grid modernization proceedings as well as Load Research Studies ("LRS") and other quantitative analyses.

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[1] Vote Solar, *Revised Affirmative Testimony of Sachu Constantine*, May 8, 2020, lines 21-36.

18	Q.	**Have you previously testified before the Utah Public Service Commission ("PSC"**
19		**or "Commission")?**

20	A.	Yes. I submitted Revised Affirmative Testimony dated May 8, 2020 in Phase 2 of this
21		proceeding.

22	Q.	**Have you previously testified before other regulatory commissions?**

23	A.	No.

II. PURPOSE OF TESTIMONY

24

25	Q.	**What is the purpose of your rebuttal testimony in this proceeding?**

26	A.	My rebuttal testimony covers two objectives. *First*, I review the witnesses who are
27		providing rebuttal testimony on behalf of Vote Solar and provide a summary of the
28		topics addressed in each witness's rebuttal testimony. *Second*, I review and respond to
29		the February 3, 2020 Direct Testimony filed on behalf of Rocky Mountain Power
30		("RMP") and the March 3, 2020 Affirmative Testimony filed on behalf of the Utah
31		Division of Public Utilities ("DPU") and the March 3, 2020 Direct Testimony filed on
32		behalf of the Office of Consumer Services ("OCS").

33		My lack of comments on any components of other parties' direct or affirmative
34		testimony should not be interpreted as acquiescence or agreement. In addition, I
35		reserve the right to express additional opinions, to amend or supplement the opinions
36		in this testimony, or to provide additional rationale for these opinions as additional
37		documents are produced, and new facts are introduced during discovery and hearing. I

| 38 | | also reserve the right to express additional opinions in response to any opinions or |
| 39 | | testimony offered by other parties to this proceeding. |

III. SUMMARY OF OPINIONS

41 **Q.**   **Please summarize your opinions.**

42 A.   As described in detail in Section VIII below, I recommend the following:

43   1) The Commission should reject the RMP Export Credit Rate ("ECR") proposal as fatally
44   flawed and inconsistent with both good rate design and DPU's goal of a system that
45   aligns "costs and benefits to the timing and quantity of customer generation exports
46   that are sent to the grid."[2]

47   2) Societal goals and considerations, including health benefits and carbon pollution
48   mitigation, should be considered by the Commission in evaluating the ECR.

49   3) The Commission should make a determination that the benefits of the net metering
50   ("NEM") Program exceed its costs and should re-open the NEM Program to new
51   customers as of the effective date of its order in this proceeding.

52   4) In the alternative, the Commission should adopt the Vote Solar ECR program design
53   and rate of 22.2 ¢/kWh.

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[2] DPU, *Direct Testimony of Robert A. Davis*, Mar. 3, 2020, lines 377–78.

IV. OVERVIEW OF REBUTTAL TESTIMONY OF VOTE SOLAR WITNESSES

Q. Please provide an overview of all witnesses providing rebuttal testimony on behalf of Vote Solar.

A. As a part of its affirmative case, Vote Solar provided testimony from a total of six witnesses, including myself, which are summarized in my Revised Affirmative Testimony of May 8, 2020. In rebuttal, Vote Solar is providing testimony from a total of five witnesses, including myself. The testimony of Vote Solar's additional four rebuttal witnesses is described below.

1. **Dr. Albert Lee**, Founding Partner and Economist at Summit Consulting, LLC, provides his expert rebuttal opinion of the testimony of DPU witness Robert Davis on March 3, 2020 ("Davis Testimony") and the testimony of RMP witness Daniel MacNeil on February 3, 2020 ("MacNeil Testimony"). With respect to the Davis Testimony, Dr. Lee finds:

   - The sample used by Mr. Davis to calculate the Full Requirement (i.e., Deliveries + Production – Export) figures in his Testimony is not representative of the entire RMP population;

   - The sampling weights used for calculating the export totals in the Davis Testimony and supporting files are incorrect;

75	• Therefore, the total export figures in the Davis Testimony do not reflect the
76	statistical sample design and are an inaccurate estimation of the population of
77	interest;
78	• The sample sizes are insufficient to meet the confidence levels required by
79	RMP's own sampling plans for the Original 36 and Schedule 135
80	populations.[3]
81	With respect to the MacNeil Testimony, Dr. Lee finds:
82	• The proposed Schedule 137 rates (i.e., the ECR at issue in this proceeding)
83	would result in a reduction of export credits of 80% or more for residential
84	customers as compared to the current amount of export credits;
85	• The application and metering fees under the proposed Schedule 137 are
86	sufficiently high while the expected export credits are sufficiently low that the
87	average customer would effectively be paying to export energy back to the
88	grid for the first three years;
89	• The low export credits would persist even if the peak hours in the proposed
90	Schedule 137 were expanded.[4]
91	2. **Dr. Michael Milligan**, Principal at Milligan Grid Solutions, provides rebuttal to the
92	MacNeil Testimony and the Davis Testimony. Dr. Milligan notes that:
93	• The RMP method is flawed, uses historical price curves that do not reflect the
94	state of the future grid, and rests on a model that RMP is likely to retire;

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[3] Vote Solar, *Rebuttal Testimony of Albert Lee*, July 15, 2020, lines 45-58.
[4] *Id.* at lines 59-80.

95   •   RMP's argument that customer generation ("CG") solar does not supply any

96   capacity benefit to the grid is demonstrably incorrect;

97   •   RMP's assignment of integration costs only to solar is discriminatory as

98   conventional resources including gas, coal, or nuclear can impose integration

99   costs and inverter-based resources, including CG solar, can provide the very

100   grid services that are required for integration in the first place.[5]

101   3. **Mr. Curt Volkmann**, President and founder of New Energy Advisors, LLC, rebuts the

102   MacNeil Testimony and Davis Testimony. Mr. Volkmann opines that:

103   •   Avoided line transformer losses should be included in the CG ECR;

104   •   There is no evidence that CG variability is causing "wear and tear" on RMP's

105   distribution equipment;

106   •   CG output can reduce the need for transmission and distribution capacity

107   additions;

108   •   Advanced inverters can mitigate voltage concerns related to CG output;

109   •   RMP's proposed CG metering fee is arbitrary and excessive. [6]

110   4. **Dr. Carolyn Berry**, Principal at Bates White Economic Consulting, rebuts the

111   MacNeil Testimony, the Davis Testimony, and the testimony filed by RMP witness

112   Robert Meredith ("Meredith Testimony). Dr. Berry finds that:

113   •   RMP's proposal for *time-varying* ECRs for Schedule 137 is inconsistent with

114   system needs and practices, inefficient in changing customer behavior,

115   untested, and likely ineffective;

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[5] Vote Solar, *Rebuttal Testimony of Michael Milligan,* July 15, 2020, lines 38-50.
[6] Vote Solar, *Rebuttal Testimony of Curt Volkmann*, July 15, 2020, lines 20-30.

116   • RMP's proposal for *instantaneous netting* lacks transparency, does not promote

117   economically efficient decisions by consumers, is difficult to understand, and

118   will adversely affect new CG installations;

119   • RMP's proposal to *update the ECRs on an annual basis* is discriminatory,

120   introduces significant price instability for energy, and increases administrative

121   burdens while actually increasing risks and financing costs for the CG

122   community;

123   • RMP's proposal to *allow export credits to expire on an annual basis* is

124   inherently unfair, sends the wrong signal on the value of saving energy, and

125   does not effectively address RMP's concerns about oversizing of CG systems;

126   • RMP's proposed *$150 application fee* is inconsistent with industry practice,

127   including PacifiCorp (RMP's parent company), and is not cost-justified.[7]

128   V.   OVERVIEW OF VOTE SOLAR CONCERNS WITH THE RMP

129   EXPORT CREDIT RATE PROPOSAL

130   **Q.**   **Please describe your understanding of RMP's ECR proposal.**

131   A.   RMP's ECR proposal is described broadly in the Direct Testimony of RMP Witness

132   Joelle Steward ("Steward Testimony"), the MacNeil Testimony, and the Meredith

133   Testimony. The proposed Schedule 137 Net Billing program is a replacement for the

134   Schedule 136 Transition program and the earlier Schedule 135 NEM program. The

135   Schedule 137 Net Billing program would:

136   • Set an ECR for all CG exports based on the season and time of day;

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[7] Vote Solar, *Rebuttal Testimony of Carolyn Berry*, July 15, 2020, lines 41-113.

137	• Exports would be netted in real time;
138	• Export credits would expire after one year;
139	• A new export credit rate would be established each year for all Schedule 137
140	customers; and
141	• All CG customers would be subject to a $150 application fee and a $160
142	metering fee.

143   Mr. MacNeil describes the methodology for setting the Schedule 137 ECR based on

144   the avoided energy costs, avoided line losses, and the integration costs of solar energy.[8]

145   Mr. MacNeil presents RMP's ECR proposal in summary form in a table called "Export

146   Credit Summary by Element" as an attachment to his Testimony.[9]

147   **Q.**   **How does this differ from the Vote Solar ECR proposal as described in your**

148   **Revised Affirmative Testimony?**

149   A.   Vote Solar's primary recommendation, based on our analysis and the testimony of our

150   five expert witnesses, was to reopen the NEM Program (Schedule 135 service)

151   immediately. At 22¢/kWh, the value of the exported energy far exceeds the average

152   retail cost of 10.2¢/kWh.[10] Based on our analysis, the Commission should find that the

153   benefits of the Schedule 135 NEM program exceed the costs, and it would be just and

154   reasonable to reopen enrollment in the program.[11] In the alternative, Vote Solar

155   proposed an ECR structure that differs from the RMP proposal in six categories:

156   (1) netting period; (2) credit expiration; (3) customer ECR vintage; (4) ECR value (or

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[8] RMP, *Direct Testimony of Daniel MacNeil*, Feb. 3, 2020, lines 39-58.
[9] *Id.*, Exhibit DJM-1.
[10] *Constantine Affirmative*, lines 295-331.
[11] *Constantine Affirmative*, lines 333-58.

157	price); (5) ECR updates; and (6) the use of time varying ECR prices. In addition, the
158	Vote Solar ECR proposal would permit both existing NEM and Transition program
159	customers to take service under the new ECR program at their discretion. Vote Solar's
160	Affirmative Testimony did not contemplate the increases to the application and
161	metering fees suggested by RMP, although those proposals are addressed in Rebuttal.
162	Table 1 below summarizes the key differences in the Affirmative Testimony.

163   **Table 1: Key Differences Between RMP and Vote Solar ECR Proposal[12]**

Element	RMP	Vote Solar
Netting Period	Instantaneous	Hourly
Excess Export Credit Expiration	Annually	Never*
ECR Vintage	1 Year	20 Year
ECR Price (cents/kWh)	1.5	22.2
Time Varying ECR	Yes	No
Customer Eligibility	New CG customers	All CG customers
Application Fee	$150	-
Metering Fee	$160	-
ECR Update	Annually	w/GRC**

*Rolls over annually or cashed out
**In other words, no more frequently than rates are generally updated

| 164 | **Q.** | **What concerns do you have about the RMP ECR proposal?** |

165	A.	I have read and reviewed (1) the Steward Testimony, the MacNeil Testimony, and the
166		Meredith Testimony filed on behalf of RMP; (2) the Davis Testimony filed on behalf
167		of DPU; and (3) the Direct Testimony of OCS witness, Ms. Cheryl Murray ("Murray
168		Testimony"). In addition, I have read and reviewed the Rebuttal Testimony submitted
169		by Vote Solar witnesses, Dr. Lee, Dr. Milligan, Mr. Volkmann, and Dr. Berry. I

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[12] This does not change Vote Solar's primary recommendation that the NEM program (Schedule 135) be reinstated.

170   conclude, as discussed in detail below, that the RMP proposal is deficient in two main

171   areas related to the differences shown in Table 1 above: (1) program design and (2)

172   ECR calculations.

173   **VI.   RMP'S PROPOSED NET BILLING PROGRAM DESIGN DOES**

174   **NOT PROVIDE JUST AND REASONABLE COMPENSATION**

175   **FOR CG EXPORTS**

176   **Q.   What are your specific concerns with RMP's proposed ECR program design?**

177   A.   I find that the RMP Proposed ECR program violates principles of good rate design.

178   James Bonbright's eight principles of good rate design, still the recognized

179   authoritative list over half a century later, dictate that rates should: [13]

180   1. Be simple, understandable and feasible (or actionable)
181   2. Be free from controversies about proper interpretation.
182   3. Be effective in yielding total revenue requirements.
183   4. Be revenue stable from year to year.
184   5. Promote stability of the rates themselves (gradualism).
185   6. Be fair in allocation.
186   7. Avoid "undue discrimination.
187   8. Be efficient in promoting beneficial use of energy, discouraging wasteful use
188   and supporting alternative (or competing) types of service

189   The Schedule 137 Net Billing service proposal violates these principles of good rate

190   design in several ways: (1) it will effectively result in a sudden, dramatic rate increase

191   for participating CG solar customers as compared to participants in the NEM or

192   Transition programs, contrary to the gradualism principle of good rate design; (2) the

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[13] James C. Bonbright, *Principles of Public Utility Rates* (New York: Columbia University Press, 1961), 291.

193		stark difference between delivery and export rates effectively discourages any export
194		behavior—let alone investments in solar—even when it would benefit the RMP grid,
195		thereby making it inefficient and misaligned with cost recovery; (3) the proposed ECR
196		peak and off-peak schedules are themselves inefficient and counter-productive; (4) real
197		time, or instantaneous, netting does not provide an actionable price signal for
198		residential and small commercial CG customers; (5) program updates and price setting
199		lack transparency and increase risk to existing and future CG customers; (6) proposed
200		fee increases are unjustified and unfairly applied; and (7) excess export credit
201		expiration provisions are punitive and contribute to the inefficiency of the overall rate
202		design.
203	**Q.**	**How does the RMP ECR proposal lead to a rate increase?**
204	A.	The proposed ECR will result in a more than 80% reduction in the value of the CG
205		customers' export credits as compared to the current Schedule 136 Transition
206		program.[14,15] While it is true that no existing CG customer will be forced to suffer such
207		an immediate drastic decline in the value of their exports and, by extension their solar
208		system investment, future solar owners will effectively have to pay more for their
209		energy despite making similar investments and having broadly similar consumption
210		and cost of service. A *reduction* in the rate for kilowatt-hour exports has the same
211		effect on future CG solar customer as an *increase* in the rate for kilowatt-hour
212		deliveries.

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[14] *Davis Direct*, lines 430-35.
[15] *Lee Rebuttal*, lines 296-97.

213 **Q.** **Why is this a concern?**

214 A. A residential or small-commercial CG solar customer has essentially purchased 25-30

215   years of demand-side savings. They will use less grid-supplied energy overall and free

216   up grid capacity during peak times. This is not dissimilar to purchasing a more efficient

217   refrigerator or HVAC system, which also results in less grid consumption and reduced

218   strain on the system during peak hours. Good rate design would not contemplate

219   drastically restricting the savings of a customer who made such a purchase one day

220   compared to a customer who made that same purchase a day or a week or a year prior.

221   This would violate the principles of both fairness and gradualism. Yet this is precisely

222   what RMP's proposed ECR would do.

223 Q. **Do you agree with the Davis Testimony that the principle of gradualism does not**

224   **apply in this regard?**

225 A. I disagree with the Davis Testimony that just because an existing CG customer will not

226   experience this rate increase (or ECR decline), the principle of gradualism does not

227   apply.[16] While individual bills may differ because of specific usage patterns, certain

228   customers within a class should not face sudden and dramatic rate increases, and any

229   intra-class differences that result from policy changes should be fair and emerge over

230   time. I strongly agree with Dr. Berry that RMP's ECR proposal will have an "adverse

231   effect on future CG customers and on the industry as a whole" and that the Davis

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[16] *Davis Direct*, lines 436-41.

232   Testimony ignores the disruption this rate increase would cause for producers,

233   installers, and service providers in the CG solar community.[17]

234 **Q.   How will CG customers respond to the proposed ECR?**

235 A.   Once a solar system is installed, a residential or commercial CG customer has virtually

236   no control over the amount and timing of generation. Therefore, the only way to

237   respond to the ECR price signal is to change consumption, some of which may be very

238   inelastic, as discussed below. A very low ECR means that on balance fewer people

239   will choose solar, and when they do, they will try to self-consume even when it would

240   benefit the grid for them to export. As Dr. Berry also notes, under the proposed ECR,

241   "[t]he CG customer receives so little compensation for exports relative to the price s/he

242   must pay for deliveries that the customer can substantially improve the value of the

243   solar investment by matching consumption to production and exporting as little as

244   possible..."[18] This means that CG customer consumption is unnecessarily shifted to

245   peak periods when RMP is trying to reduce consumption and that consequently CG

246   exports are not available to offset neighboring customers' demands precisely when the

247   system is under stress. Because they cannot accurately predict solar production in any

248   given moment, CG Customers may shift their consumption even if there would not

249   have been any net exports which is inefficient and counterproductive. Even ignoring

250   the problems with the design and scheduling of the time-varying rates that RMP

251   proposes, which I will address below, setting the ECR at the proposed peak value of

252   2.413 ¢/kWh for all hours would have little effect when compared to RMP's average

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[17] *Berry Rebuttal*, lines 395-407.
[18] *Id*. at lines 298-301.

| 253 | delivery rate of 10.2 ¢/kWh, as Dr. Berry[19] and Dr. Lee[20] observe in their respective |
| 254 | analyses. |

255 **Q. How else might CG customers react to the low ECR?**

256 A. In addition to the behavior changes described above, Dr. Berry and I both find that the

257 significant difference between export and delivery prices would induce additional

258 investment in energy storage technology and drive customers to undersize their solar

259 systems or possibly defect from the grid. Ostensibly, more storage on the grid, both

260 customer-side and utility-side, promotes system efficiency, enhances grid resilience

261 and reliability, and reduces the cost of integration of a range of resources. But the size

262 and operation of solar and storage assets should be optimized for full effect. Dr. Berry

263 describes the problem with sizing simply to avoid exports:

264 [B]oth the solar and the battery installation will be sized to optimize CG
265 customer consumption, not integration with the grid. This may result in
266 undersizing of both when grid benefits are not considered in the setting
267 of ECR rates…RMP's ECR proposal may also incentivize the
268 inefficient oversizing of the battery if the CG customer decides to
269 permanently disconnect itself by defecting from the grid and no longer
270 taking RMP service. Many potential benefits will be lost if CG
271 customers install battery storage solely for their own use to defect from
272 the grid. It will result in spreading fixed costs over a smaller pool of
273 ratepayers, the deprivation of services that CG customers' solar and
274 battery system could offer the grid, and duplicative investment in
275 infrastructure. Integrating the operation of CG solar with battery
276 storage into the system improves overall efficiencies and lower costs for
277 all customers. RMP's ECR proposal fails to consider how CG
278 generation is used with complementary technologies and the
279 implications of that for ratemaking.[21]

[19] *Berry Rebuttal*, lines 295-98.
[20] *Lee Rebuttal*, lines 339-51.
[21] *Berry Rebuttal*, lines 351-63.

280   In other words, future CG solar customers may respond to the low ECR by reducing

281   their investments in solar and energy storage or by abandoning RMP service, either of

282   which are disadvantageous for the grid. Reduced customer investments will lead to

283   RMP investments for the grid that would otherwise not be needed, raising costs for

284   everyone. If the CG solar customer goes even further and leaves RMP service entirely,

285   the problem is compounded. Good retail rate design should be simple, realistic, and

286   promote efficient use of grid resources and certainly not drive ratepayers away.

287 **Q. How should the ECR be set in relation to the delivery rate?**

288 A.   In general, retail customers lack the sophistication, ability, or even the need to arbitrage

289   the export of energy to maximize grid benefit. All retail customers will try to respond

290   to the price signals they receive from the utility and act in the way that is most

291   economically rational for them. Consumption is all they can control, so the relevant

292   price signal to them should be reflected in delivery rates, not export rates. Since

293   average retail energy rates are significantly lower than the full value of CG as I noted

294   in my Revised Affirmative Testimony,[22] customers should be made at least indifferent

295   to exports as compared to deliveries. Delivery rates can be set in blocks or time-

296   varying, but they should consistently signal to customers by setting lower delivery rates

297   when RMP wants customers to consume more and higher delivery rates when RMP

298   wants customers to consume less or even export when RMP grid is stressed. Well-

299   designed time-of-use ("TOU") rates, such as the optional RMP Electric Vehicle ("EV")

300   TOU rate, promote both long- and short-term system efficiency by sending a strong,

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[22] *Constantine Affirmative*, lines 324-25.

301	clear, and actionable price signal for consumption.[23] Therefore, the clearest, simplest,
302	and most cost-effective way to induce the desired export behavior from CG customers
303	is to focus on good rate design for deliveries and to reopen the Schedule 135 Net
304	Metering program allowing for energy storage paired with solar and a single unified
305	rate for exports and deliveries. At the very least, an ECR distinct from the delivery rate
306	should not set up a conflict between customer interests and the efficient operation of
307	the grid.

308	**Q.**	**If TOU rates for deliveries can promote efficient behavior, why do you claim that**
309		**the peak/off-peak schedules proposed by RMP are inefficient?**

310	A.	Mr. Meredith, testifying on behalf of RMP's EV TOU tariff correctly states:

311	A time of use rate should induce customer behavior that promotes economic
312	efficiency. A change in customer behavior that keeps usage away from the times of
313	the Company's peaks, if adopted by a sufficiently large number of customers over
314	a sufficiently long period of time, may yield benefits for the Company's system and
315	allow it to avoid or defer making investments.[24]

316	The MacNeil testimony lays out the RMP ECR proposal. It includes instantaneous (or
317	"real-time") netting and differing peak and off-peak rates depending on the season and
318	hour. The peak rates are from 7-9am and 6-8pm in the winter, and 4-8pm in the
319	summer. The ECR price ranges from the lowest off-peak rate of 1.325¢/kWh in the

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[23] *Berry Rebuttal*, lines 261-62.

[24] Rocky Mountain Power, *Direct Testimony of Robert M. Meredith*, ("Meredith EV Testimony"), Utah Public Service Commission, Docket No. 16-035-36, lines 107-111, Jan. 31, 2017, https://pscdocs.utah.gov/electric/16docs/1603536/291434DirTestMeredith1-31-2017.pdf.

320   winter to 2.629¢/kWh for the summer peak. RMP proposes to update these prices and

321   time periods annually.

322   In this regard, the RMP ECR proposal for time-varying export prices makes four

323   fundamental errors:

324   • Customers cannot respond effectively to the price signal from the proposed

325   time-varying ECR because they cannot efficiently adjust consumption in

326   intervals less than one hour;

327   • The ECR proposal does not set time periods consistent with system peak and

328   off-peak periods or with other TOU rates;

329   • The peak to off-peak price ratio is insufficient to change behavior and even

330   setting the ECR at the proposed peak value of 2.413 ¢/kWh for all hours would

331   have little effect when compared to an average delivery rate of 10.2 ¢/kWh;

332   • The process of setting and updating both the price and the time periods will

333   introduce additional uncertainty and blunt any remaining effectiveness of the

334   time-varying ECR.

335 **Q.**   **Why are customers unable to respond effectively to the proposed time-varying**

336   **ECR?**

337 A.   CG customers are not sophisticated energy brokers; they cannot effectively control

338   supply nor perfectly manage demand. Theoretically, CG customers would want to

339   export more during the ECR peak periods, but Dr. Berry's analysis shows that CG solar

340   customers would be driven to consume during peak periods, regardless of their

341	production and ultimately forego any exports.[25] Even if the CG customer wanted to
342	respond to the ECR price signal, they would find it difficult. As I observed in my
343	Revised Affirmative Testimony:

344	Residential customers in particular will have little understanding or control over
345	their intra-hour electric consumption habits as many drivers of residential
346	consumption like air conditioners, refrigerators, and other major appliances
347	cycle on and off automatically. For those load drivers that are controlled by the
348	customer such as dishwashers, washing machines, hair dryers, and other
349	appliances, many residential customers will find it difficult to adjust
350	consumption within the hour, as family schedules and work schedules drive
351	meal times and appliance use, rather than the desire to match load with solar
352	[production].[26]

353 **Q.** **Why is the time-varying ECR inconsistent with other RMP TOU rates?**

354	A.	RMP's ECR proposal errs by using time-varying rates based on the wholesale prices
355		set by sophisticated participants in the Western Energy Imbalance Market ("EIM"),[27]
356		rather than alignment of ECR peaks with system peaks as Mr. Meredith correctly notes
357		should be the basis for customer-facing TOU rates.[28] The ECR peak periods are one
358		to three hours offset from the system peak as indicated by TOU rates for delivery. The
359		wholesale ECR price is, in any case, insufficient to encourage exports, and so in effect
360		incentivizes consumption to prevent exports whenever the sun is shining. RMP thus
361		sets up conflicting signals to consumers,[29] some of whom are encouraged to consume

[25] *Berry Rebuttal*, lines 295-98.
[26] *Constantine Affirmative*, lines 407-14.
[27] RMP, *Direct Testimony of Daniel MacNeil*, Feb. 3, 2020, lines 194-207.
[28] Meredith EV Testimony, lines 107-11.
[29] *Berry Rebuttal*, lines 284-318.

362		less during one period, while others (CG customers) are effectively encouraged to
363		consume more in an overlapping but different time period. The correct frame is the
364		retail price and timing of stress on the system as a whole.

365	Q.	Why is the peak to off-peak ratio and the difference between export and delivery
366		rates important?

367	A.	RMP's ECR offer is insufficient to induce the desired shift in consumption. For one,
368		peak to off-peak price ratios should be at least 2 to 1 to motivate any load shifting.
369		RMP's Schedule 2E EV TOU ranges as high as 10 to 1, for example.[30] But the RMP
370		ECR is only 1.6 to 1 or 1.5 to 1, depending on the season. Primarily, however, the
371		problem is the dramatic difference between the proposed ECR which tops out at
372		2.6¢/kWh and the delivery rate of 10.2¢/kWh. Solar customers are simply better off
373		using all of their solar production for their own use. Thus, at times when TOU rates
374		are encouraging non-CG customers to conserve energy and when CG solar exports
375		could provide clean, low-cost energy and grid congestion relief, CG solar customers
376		are incentivized to consume more and actively prevent exports to the grid. If they are
377		not producing enough for their own use during peak hours, they would actually draw
378		more power from the grid than would otherwise be the case.

379	Q.	How do annual updates introduce uncertainty for CG customers?

380	A.	RMP proposes annual updates to the ECR based on historical 3-year average price
381		curves from the Western EIM. There are many problems with this approach, as

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[30] *Berry Rebuttal*, lines 192-97.

382   discussed in detail by Dr. Milligan and Dr. Berry in their respective Rebuttal

383   Testimonies.[31] However, from a purely practical perspective, this yearly fluctuation in

384   the time and price signals sent by the proposed ECR will simply make it more difficult

385   for consumers to understand both current rates and plan future behavior, blunting the

386   effects on CG solar customer behavior, and undermining the efficiency and

387   effectiveness of the time-varying rate design.

388 **Q.**   **How should the ECR be updated?**

389 A.   I continue to recommend, as stated in my Revised Affirmative Testimony,[32] that an

390   individual CG customer receive a fixed ECR for 20 years and that updates to the ECR

391   occur no more frequently than general rate cases. First, the ECR is part of the CG

392   customers' overall rate for electricity service, and no other retail customers face annual

393   updates. Annual updates would be "discriminatory" and erode "price stability,"

394   contrary to principles of good rate design.[33] Additionally, CG solar customers are

395   making 20- to 30-year investments in energy infrastructure that will benefit the grid

396   and all ratepayers.[34] Yet, these families and businesses have no way to reliably

397   evaluate the impacts that an investment in CG would have on their personal financial

398   situation if the ECR is permitted to fluctuate.[35] Annual updates shift all price risk to

399   CG customers and the CG solar community, driving up financing costs and potentially

400   restricting access to beneficial solar. This risk could be diversified at a lower cost by

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[31] *Milligan Rebuttal*, lines 166-83; *Berry Rebuttal*, lines 728-38.
[32] *Constantine Affirmative*, lines 424-89.
[33] *Berry Rebuttal*, lines 664-73.
[34] *Constantine Affirmative*, lines 326-28.
[35] *Constantine Affirmative*, lines 430-33.

401		RMP and without the increased administrative and regulatory burden of a complex
402		modeling and rate setting process by tracking multiple vintages of ECRs through a
403		billing software adjustment. I address additional concerns below about the method
404		proposed to set the ECR and the lack of transparency in the modeling.

405   Once a just and reasonable ECR is established in this proceeding, I recommend that

406   the Commission revisit its evaluation no earlier than 2024 and thereafter on the same

407   schedule as RMP's general rate cases. In the same way that real-time pricing should

408   only be used when actionable, annual updates only make sense when they are a better

409   way to balance price risk between customers and the utility. In this case, they are not.

410   Retail rates are already adjusted in a way and on a pace that is familiar and appropriate

411   to customers, regulators, and utilities. To the extent that they need adjustment, ECR

412   updates should proceed on that same schedule.

413 **Q.** **Do you agree with Mr. Meredith that instantaneous netting simplifies decisions**

414   **for CG customers?**

415 A. No. As I stated in my Revised Affirmative Testimony, "[w]ell-designed rates provide

416   price signals that are understandable and actionable for customers."[36] Instantaneous

417   netting, or "real-time" netting as Dr. Berry puts it, requires moment-to-moment

418   vigilance, of which retail customers are unlikely to be capable.[37]

419   Even under the 15-minute netting currently in place for the Schedule 136 Transition

420   program, customers would have to track over 70,000 data points a year in order to

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[36] *Constantine Affirmative,* lines 387-88.
[37] *Berry Rebuttal*, lines 487-94.

421   optimize their consumption behavior with respect to their solar production. As I

422   previously stated, "[i]t is impracticable for a family to attempt to adjust behavior in

423   response to such a price signal, making the ECR under the Transition Program neither

424   understandable nor actionable."[38] The increased volume and complexity under

425   instantaneous netting would be impossible even if the customers had access to such

426   granular information. They do not, at least, in any practical sense.[39] At a minimum,

427   this violates OCS's criteria of transparency and simplicity for the RMP ECR

428   proposal.[40] Similarly, on the production side, customers can predict monthly, daily,

429   and even hourly solar generation with confidence, but variability within each hour adds

430   uncertainty.[41]

431   By comparison, hourly netting is far easier for customers to respond to and would

432   make it simpler for prospective CG solar customers to assess the risks and value of

433   their investment. RMP provides no clear evidence that instantaneous netting would

434   reduce administrative costs. Therefore, the most prudent option from an actionable

435   rate design perspective is to move to hourly netting.

436 **Q.**   **What concerns do you have about the proposed fee structure?**

437 A.   Both the proposed $150 application fee and the proposed $160 metering fee for all new

438   Schedule 137 customers are unjustified and unfairly applied. Approving them would

439   penalize future CG solar customers and send the wrong signal to RMP about its

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[38] *Constantine Affirmative*, lines 416-18.
[39] *Berry Rebuttal*, lines 488-518.
[40] OCS, *Direct Testimony of Cheryl Murray*, Mar. 3, 2020, lines 96-113.
[41] *Constantine Affirmative*, lines 415-17.

440	obligation to serve customers. In order to accommodate Automatic Meter Reading
441	("AMR") and to improve the flow of data to the company, RMP will be deploying
442	Advanced Metering Infrastructure ("AMI") meters, capable of recording both inflows
443	and outflows of energy to its customers on an interval basis, meaning over short time-
444	periods. Mr. Volkmann's Rebuttal Testimony confirms that the metering fee is
445	"arbitrary and inconsistent with what the Company charges non-CG customers who
446	have a reprogrammed AMI meter or receive a new AMI meter."[42] RMP deploys these
447	meters, or reprograms or repairs existing ones as needed, for non-CG customers and
448	simply rolls the cost into the ratebase. Charging CG customers for the same meter is
449	discriminatory, as is charging a flat $160 fee for a $20 reprogram.[43]
450	Similarly, the proposed application fee would raise the cost for Level 1 and Level 2
451	applicants, the vast majority of CG solar customers, by $90 and $75 respectively
452	without any justification.[44] This is inconsistent with PacifiCorp's, RMP's parent
453	company, practice in Oregon, Wyoming, Washington and Idaho where CG NEM
454	customers pay no application fee.[45] There is no evidence that the administrative or
455	customer service costs associated with these Schedule 137 applications is greater than
456	for any other RMP service, and the engineering review costs attributed to the
457	application are simply an average that grossly overstates the impact of smaller systems.

[42] *Volkmann Rebuttal*, lines 439-42.
[43] RMP, *Direct Testimony of Robert Meredith*, Feb. 3, 2020, lines 235-50.
[44] *Berry Rebuttal*, lines 842-66.
[45] *Berry Rebuttal*, lines 823-34.

458   If anything, the application fee for smaller systems should be reduced from the current

459   Schedule 136 charges.[46]

460   Aside from their arbitrariness, the sheer magnitude of the fees is punitive and severely

461   erodes any existing fairness of the overall ECR proposal. As Dr. Lee found in his

462   analysis, a typical CG solar customer could expect to accumulate $96 in export credits

463   the first year under the proposed ECR. If the ECR remained fixed—which it would not

464   under the RMP proposal—it would take 3.3 years to recover the $310 cost of joining

465   the program, by which time the CG customer would have exported almost 20,000 kWh

466   to RMP for resale by the Company at full retail rates.[47] At this scale, the fees are less

467   of a method of cost recovery and more of a deterrent to participation.

468   Finally, deploying and maintaining AMI benefits all ratepayers by improving data

469   collection, facilitating AMR, streamlining billing, and enabling other grid services. All

470   of RMP's schedules and fees are designed to provide a service for a fair price, and CG

471   solar is just another reasonable service that customers may desire. It is not appropriate

472   to use fees to deter customer uptake of beneficial technologies or services. In fact,

473   RMP should be encouraged to adopt best practices and cost-reducing technologies in

474   order to facilitate and streamline those very services, as is the case in other

475   jurisdictions.[48] Approving these fees would not send that signal.

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[46] *Berry Rebuttal*, lines 920-28.
[47] *Lee Rebuttal*, lines 328-38.
[48] *Berry Rebuttal*, lines 926-28.

476 **Q.** **How does RMP propose to treat excess export credits?**

477 A. Mr. Meredith proposes allowing any annual accumulated export credits net of energy

478 charges to expire in March of each year. The sole justification for this measure is to

479 encourage customers to properly size their solar systems.[49]

480 **Q.** **Do you agree with this treatment of excess export credits?**

481 A. No. Doing so would be unnecessarily punitive as there are better ways to ensure the

482 proper sizing of the system to offset load. For example, a family or individual

483 purchasing a solar system is making a 20- or 30-year investment in their energy future.

484 Given the variation possible in monthly energy demand and solar production, they are

485 taking on a large operational and technology risk. Even if the installer has scrupulously

486 sized their system to meet expected average load, there is still just as much of a chance

487 that the CG customer ends up with a deficit as there is of ending up with excess credits.

488 Furthermore, if the ECR is just and fair, then CG customers have earned either the

489 deficit or the credit. Not only would it be punitive to expire the credits, but it would

490 also have the effect of discouraging conservation or energy efficiency investments, for

491 fear of lost credits.

492 A better way to ensure that systems are sized to load is to require that installers verify

493 expected annual load using the customer's historical metered data or an RMP-approved

494 proxy as part of the interconnection application process. This would establish a

495 maximum permissible system size, with some reasonable allowances for future load

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[49] *Meredith Direct*, lines 157-62.

| 496 | increases, such as EV charging. Dr. Berry makes a similar argument in her Rebuttal |
| 497 | Testimony.[50] |

498	Excess credits should be rolled over each month. On an annual basis they could be
499	monetized or rolled over into the next year, but in all circumstances, they remain the
500	customer's earned credits and should not be arbitrarily taken. CG customers have made
501	a huge financial decision, based in part on policy, price, and environmental signals, and
502	if that investment produces exports that RMP sells to other customers to meet their
503	energy demand, it is only fair that the CG customer retain the credits for those exports
504	regardless of whether they are net excess credits or not.

VII. RMP'S CALCULATION OF THE PROPOSED ECR IS FLAWED

506 **Q.   Why do you think the ECR is set too low?**

507	A.	RMPs proposal is based on certain flawed methodologies and incorrect input
508		assumptions. Dr. Lee determined that errors in the sampling methodology and
509		calculations of population statistics result in a non-representative sample which in turn
510		leads to significant miscalculations of the CG exports that determine the impacts of the
511		ECR proposal. Based on population statistics calculated by Dr. Lee, the sample size is
512		insufficient for the desired confidence levels. Based on Dr. Milligan's analysis, I
513		conclude that RMP's use of a historical price curve is a flawed method and does not
514		represent future conditions well in any case. Dr. Milligan also shows that the GRID
515		model lacks the transparency and granularity required for this analysis and is likely to

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[50] *Berry Rebuttal*, lines 792-801.

516   be retired from use anyway in favor of more robust models. RMP's finding that CG

517   solar installations receive no capacity credit is incorrect and not consistent with best

518   practices in other states as shown by Mr. Volkmann. Similarly, he observes that the

519   assignment of integration costs is discriminatory and arbitrary and fails to acknowledge

520   that modern inverter-based technologies like CG solar can provide grid services that

521   reduce integration costs. Mr. Volkmann finds the RMP proposal also fails to include

522   avoided line transformer losses. The net result of these deficiencies is an inaccurately

523   low export credit price.

524 Q.   **What is the problem with the representative sample of customers used to support**

525   **the RMP ECR proposal?**

526 A.   Dr. Lee's findings confirm that the population sample used in the Davis Testimony to

527   calculate the Full Requirement (=Deliveries+Production–Exports) for CG solar

528   customers is not representative of Schedule 136 Transition customers or of future

529   proposed Schedule 137 Net Billing customers. Schedule 136 solar systems are newer

530   and have an average capacity of 6.9 kW compared to 6.4 kW for Schedule 135. As a

531   result, the Davis Testimony underestimates total CG solar production and exports.[51]

532   This is crucial because the MacNeil Testimony relies in part on the Davis Testimony's

533   calculations to justify RMP's proposed ECR. Furthermore, the Davis Testimony erred

534   in the calculation of sampling weights and does not justify the sample size, which Dr.

535   Lee, using appropriate precision statistics, determined "to be insufficient to meet the

536   requirements provided in the Davis Report."[52]   These deficiencies suggest that

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[51] *Lee Rebuttal*, lines 212-22, 236-37.
[52] *Id.* at lines 371-74.

537   downstream calculations used to support the RMP ECR proposal based on the Davis

538   Testimony population statistics are suspect. This also confirms Vote Solar's original

539   concerns with the RMP LRS design. Vote Solar decided to pursue its own LRS because

540   these were not fully addressed by the modifications placed on the study in the

541   Commission's Phase 1 Order.[53]

542 **Q.**   **Why is it not appropriate to use historical price curves to estimate future market**

543   **conditions?**

544 A.   Rate setting is fundamentally prospective and should be set today to recover the future

545   cost of service. Allowances can be made to correct for over- or under-collection, but

546   rates are not historical, they are forward looking. In its 2019 Integrated Resource Plan,

547   RMP acknowledges that the Official Forward Price Curve ("OFPC") is the best

548   available approximation of future market conditions but then sets the proposed ECR

549   based on historical price curves in the Western EIM. As Dr. Milligan observes, "[the

550   implication of RMP's approach is that the relative prices from the EIM do not capture

551   the changing nature of the power system, as large coal units are retired and deployment

552   of new renewable and storage facilities increase.."[54] Fundamentally, the RMP EIM

553   approach is backward looking while the Vote Solar approach is forward looking. Vote

554   Solar utilizes the OFPC that was developed for each hour from 2021-2040 and for each

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[53] *Constantine Affirmative*, lines 238-41.
[54] *Milligan Rebuttal*, lines 170-72.

555 of the relevant trading hubs.[55] As Dr. Milligan observes, "the best possible future

556 information is preferable to a simple extrapolation from the past."[56]

557 **Q.** **What are your concerns with the GRID model as it is used here?**

558 A. Dr. Milligan points to four areas of concern with using the GRID model to determine

559 the avoided costs of distributed solar generators:

560 *First*, the GRID model does not possess sufficient granularity to properly

561 calculate the energy value of CG solar energy. *Second,* the GRID model "bakes

562 in" IRP resources. *Third,* some gas plants are committed in the model and are

563 locked into that commitment schedule even if there is a change to solar energy.

564 *Fourth,* some outputs of the GRID model are modified by RMP "to accurately

565 represent avoided cost.

566 The lack of granularity is precisely why RMP turned to historical EIM price curves to

567 assign energy values to exports. As noted above, Vote Solar's method uses the OFPC,

568 developed in the more robust AuroraXMP model to assign energy values. By "baking

569 in" IRP resources, meaning assuming they all come first in the resource stack whether

570 they have been built yet or not, a production cost model like GRID ends up assigning

571 a lower incremental value to resources that are added later. This means that already

572 built distributed solar, which should actually take precedent over future unbuilt IRP

573 resources, gets undervalued. Further, the GRID model's inflexibility is exacerbated by

574 the decision to "lock in" certain gas plants for dispatch no matter the possible

575 contribution from other resources like CG solar. Dr. Milligan's testimony confirms

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[55] *Id.* at lines 262-70.
[56] *Id*. at lines 281-82.

576   that "[w]hen units are locked in, the model is unable to fully optimize the resulting

577   commitment and dispatch, which raises questions about the validity of the results."[57]

578   Finally, RMP's post hoc manual adjustments to GRID outputs lack transparency and

579   cast doubt on the accuracy of the reported results.[58] These deficiencies and the fact

580   that RMP is considering replacing GRID with a more robust model indicates that the

581   Commission should not rely on the GRID results.

582   **Q.**   **Why should CG solar installations receive "Capacity Credit"?**

583   A.   Vote Solar asserts that CG solar should receive 2.02¢/kWh in avoided Transmission

584   and Distribution ("T&D") capacity credit. It is true that CG solar is an "as-available"

585   variable resource, but that is not reason enough to deny that it can reduce the need for

586   future capacity additions as RMP's Mr. MacNeil does.[59] Dr. Milligan points out that

587   IEEE Power and Energy Society[60] and the North American Reliability Corporation

588   ("NERC")[61] recommend a probabilistic method for assessing the capacity contribution

589   of variable resources based on the mathematics of Resource Adequacy and Effective

590   Load Carrying Capability ("ELCC"). The capacity contribution of distributed solar

591   will be some fraction of the nameplate capacity, and certainly less than the equivalent

592   contribution from large scale wind and solar resources, but it is decidedly positive and

593   non-zero. Mr. Volkmann identifies specific planning approaches that assign capacity

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[57] *Id.* at lines 141-43.
[58] *Id.* at lines 149-62.
[59] *MacNeil Direct*, lines 66-68.
[60] The IEEE Power and Energy Society approved a Task Force Paper on the capacity value of wind energy. *See* Andrew Keane et al., *Capacity Value of Wind Power.*, IEEE (2011), https://ieeexplore.ieee.org/document/5565546. Other authors have addressed solar energy. *See* Roisin Duignan et al., *Capacity Value of Solar Power*, IEEE (2012), https://ieeexplore.ieee.org/document/6345429.
[61] *Methods to Model and Calculate Capacity Contributions of Variable Generation for Resource Adequacy Planning*, North American Elec. Reliability Corp. (2011), https://www.nerc.com/files/ivgtf1-2.pdf.

594   credit to CG resources and provides an example of peak load reductions from

595   distributed solar leading to $64 million in savings for a single T&D expansion project.[62]

596   In fact, failure to account for the capacity contribution of CG solar in planning phases

597   will lead to higher than necessary T&D investments. It stands to reason that customer

598   investment in CG solar should receive an appropriate credit for that contribution.

599 **Q.   How is it discriminatory to assign integration costs to a variable resource like**

600 **solar?**

601 A.   RMP deducts an "Integration Cost" from CG avoided costs because it represents "the

602   cost of holding reserves with flexible resources to reliably maintain the load and

603   resource balance."[63] There is no standard definition of integration costs, but Dr.

604   Milligan describes it as a cost imposed by one generator on another generator when

605   balancing load and supply on the grid.[64] By this broad definition, many types of

606   generators impose integration costs, as Dr. Milligan documents, but RMP only assigns

607   this cost to renewable generators. This is discriminatory on its face. Furthermore, it

608   ignores the fact that inverter-based technologies like CG solar are capable of offsetting

609   integration costs for themselves and other generators, as well as providing a host of

610   other services.[65] Mr. Volkmann's extensive discussion of voltage regulation services

611   provided automatically by IEEE 1547-2018 compliant inverters suggests that rather

612   than imposing a discriminatory integration cost on CG solar, RMP should figure out

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[62] *Volkmann Rebuttal*, lines 237-239.
[63] *MacNeil Direct*, lines 57-58.
[64] *Milligan Rebuttal*, lines 340-50.
[65] *Id.* at lines 469-83.

613   how to take advantage of the modern power-electronics and low marginal cost energy

614   provided by the CG installations.[66]

615 **Q.**   **Why should CG solar get credit for avoided line transformer losses?**

616 A.   RMP does not include avoided line transformer losses in its calculation of CG solar

617   avoided costs because of the extent to which "generation must be converted from

618   secondary to primary voltage by the line transformer...."[67] But as Mr. Volkmann

619   points out, most CG exports simply flow to other loads on the same secondary

620   distribution circuit and at a current CG penetration of less than 2%, RMP is exceedingly

621   unlikely to experience flows through the line transformers to the primary circuits.[68]

622   Credit for avoided line transformer losses should reasonably be included in the design

623   of the ECR, as Vote Solar does in its proposal, and even when penetrations and

624   backflows eventually rise to significant levels, credit should not be arbitrarily set to

625   zero.

626 **Q.**   **Does RMP include societal benefits in its ECR proposal?**

627 A.   No.

628 **Q.**   **Why should societal benefits be included?**

629 A.   As Jess Totten, Director of the Public Utilities Commission of Texas stated in a

630   presentation for the National Association of Regulatory Utility Commissioners, "[r]ate

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[66] *Volkmann Rebuttal*, lines 363-68.
[67] *Id.* at lines 77-98.
[68] *Id.* at lines 102-108.

631   regulation is an act of government exercising social policy with the objective of

632   enhancing social welfare."[69] Given that health, safety, and environmental regulation

633   are legitimate objects of public policy,[70] the health, safety, and environmental benefits

634   of CG exports should be considered under the terms of the stipulation.[71] Here, Vote

635   Solar has considered these societal benefits and included them in our ECR proposal[72]

636   while the Company has failed to factor them in at all.

637 **Q.   What is the RMP ECR proposal based on their assessment of avoided cost?**

638 A.   Using the approach described by Mr. MacNeil, and supported particularly by the

639   Meredith Testimony and Davis Testimony, RMP proposes an average ECR of

640   1.5¢/kWh, split into seasonally adjusted, time-varying peak and off-peak rates ranging

641   from 1.325¢/kWh for winter off-peak to 2.629¢/kWh for summer peak.

642 **Q.   In your opinion, is this an accurate assessment of the value of CG in RMP's Utah**

643   **service territory?**

644 A.   No. For the reasons elaborated above, 1.5¢/kWh is a significant under-valuation of CG

645   exports in Utah. The RMP ECR proposal is based on a small, non-representative

646   sample of CG customers, uses a backward-looking set of energy prices that fail to

647   capture future market price conditions, employs an inappropriate and outmoded GRID

648   production cost model, fails to include legitimate avoided capacity costs and line

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[69] Jess Totten, "*Tariff Development II: Rate Design for Electric Utilities*." Briefing for the NARUC/INE
Partnership, Feb. 1, 2008, https://pubs.naruc.org/pub.cfm?id=538EA65C-2354-D714-5107-44736A60B037.
[70] *See, e.g.*, Utah Code § 19- 7-102 (1995).
[71] Rocky Mountain Power, *Settlement Stipulation*, Public Service Commission of Utah, Docket No. 14-035-114,
Aug. 28, 2017, https://pscdocs.utah.gov/electric/14docs/14035114/296270RMPSettleStip8-28-2017.pdf.
[72] *Berry Affirmative*, lines 43-113.

649   transformer losses, arbitrarily assigns integration costs to CG solar, and ignores

650   quantifiable societal benefits. By contrast, Vote Solar's proposal corrects those

651   deficiencies, starting with a more robust sample and LRS and including RMP's own

652   best approximation of future energy market price conditions, the OFPC. Setting aside

653   societal benefits, Vote Solar arrives at a 10.2¢/kWh utility avoided cost from CG

654   solar.[73] Even after including appropriate societal benefits, the value of CG at 22.2

655   ¢/kWh, as Vote Solar proposes is likely conservative as several categories of benefits

656   have not been quantified, including avoided ancillary services cost, market price

657   impacts, reliability and resiliency value, and avoided fossil fuel lifecycle costs.

658 **Q.**   **What do you recommend based on these findings?**

659 A.   I recommend that the Commission reject the RMP ECR proposal and endorse the Vote

660   Solar LRS and avoided-cost calculations. I further recommend that the Commission

661   fulfill its obligation to make a determination on the relative costs and benefits of the

662   NEM program under Section 54-15-105.1 of the Utah Code which reads as follows:

663   The governing authority shall:
664   (1) determine, after appropriate notice and opportunity for public
665   comment, whether costs that the electrical corporation or other
666   customers will incur from a net metering program will exceed the
667   benefits of the net metering program, or whether the benefits of the
668   net metering program will exceed the costs; and

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[73] *Constantine Affirmative*, line 303, Table 1.

669	(2) determine a just and reasonable charge, credit, or ratemaking
670	structure, including new or existing tariffs, in light of the costs and
671	benefits.[74]
672	Notably, while the Commission adopted a compensation mechanism for exported CG
673	alternative to the NEM Program in Docket No. 14-035-114, it never made the
674	determination as to whether the NEM Program resulted in net benefits or net costs.
675	Indeed, the Commission indicated that it anticipated that evidence in this proceeding
676	may provide the basis for such a determination.[75] Vote Solar's analysis indicates that
677	the NEM Program constitutes a just and reasonable ratemaking structure in light of
678	these costs and benefits and the Commission could safely and credibly re-open
679	enrollment in the dormant program upon finalization of its order in this proceeding.
680	Per the terms of the Stipulation, Transition Customers should be allowed to voluntarily
681	enroll in the re-opened NEM Program at their discretion.[76]

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[74] Utah Code Ann. § 54-15-105.1 (2014).
[75] *Constantine Affirmative*, lines 349-50.
[76] *Id.* at lines 353-58.

VIII. CONCLUSIONS AND SUMMARY OF RECOMMENDATIONS

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683 **Q. What do you conclude about RMP's ECR Proposal?**

684 A. As my analysis and that of the other Vote Solar witnesses show, the proposed Schedule

685   137 Net Billing service is flawed both analytically and in terms of program design. In

686   terms of the analysis setting the export credit price:

687   - It is based on a non-representative sample design and application;

688   - The sample size is insufficient for the desired confidence levels;

689   - The use of historical market price curves is flawed and does not accurately

690   represent future conditions;

691   - The GRID model is inappropriate for determining the avoided cost from small

692   distributed resources;

693   - RMP's finding that CG solar installations receive no capacity credit is incorrect

694   and not consistent with best practices in other states;

695   - The assignment of integration costs is discriminatory and arbitrary;

696   - The RMP ECR proposal fails to include avoided line transformer losses and

697   societal benefits; and

698   - The net result of these deficiencies is an inaccurately low ECR.

699   In terms of the design of the Schedule 137 program, I find that:

700   - The low ECR will effectively result in a sudden, dramatic rate increase for

701   participating CG solar customers and disrupt the market;

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702   •   The proposed ECR peak and off-peak schedules are inefficient and likely

703   counter-productive;

704   •   Instantaneous netting is not an actionable price signal for residential and small

705   commercial CG customers;

706   •   Program updates and price setting lack transparency and increase risk to

707   existing and future CG customers;

708   •   Proposed fee increases are unjustified and unfairly applied; and

709   •   Excess export credit expiration provisions are punitive and contribute to the

710   inefficiency of the overall rate design.

711 **Q.**   **Please summarize your recommendations.**

712 A.   Taking into account the analyses and evidence reviewed in this case, I recommend the

713   following:

714   1) The Commission should reject the RMP ECR proposal as fatally flawed and

715   inconsistent with either good rate design or public policy goals.

716   2) The Commission should make a determination that the benefits of the NEM Program

717   exceed its costs and should re-open the NEM Program to new customers as of the

718   effective date of its order in this proceeding.

719   3) In the alternative, if the Commission elects to maintain the general structure of the

720   Transition Program, the Commission should adopt an ECR of 22.2 c/kWh with the

721   following program details:

722   a) Exports should be netted on an hourly basis, rather than the current, 15-minute

723   netting period or the RMP-proposed instantaneous netting;

724   b) The ECR should be fixed for a period of 20 years for individual customers;

725   c) Eligibility for each ECR vintage should be consistent with the terms of

726   eligibility adopted for legacy access to the NEM Program under the terms of

727   the Stipulation;

728   d) The Commission should eliminate the annual expiration of excess export

729   credits;

730   e) NEM and Transition Customers should have the option to take service under

731   the new ECR Program at their sole discretion;

732   f) Updates to the ECR should not occur more frequently than updates to rates

733   generally and should coincide with RMP's General Rate Case filings;

734   g) Application fees should be reduced rather than increased, and the Commission

735   should consider eliminating the Level 1 Application Fee altogether;

736   h) Metering fees should be reduced to $0.

737   i) The Commission should authorize a pilot study of time-varying rates for CG

738   exports before applying such rates to the ECR program.

739   j) Societal benefits should be included.

740 **Q.   Does this conclude your testimony?**

741 A.   Yes.

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