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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 CAROLYN A. BERRY, PH.D.

ON BEHALF OF

VOTE SOLAR

July 15, 2020

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I. Introduction

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

A. My name is Carolyn A. Berry. I am a Principal with Bates White, LLC. My business address is 2001 K Street NW, North Building, Suite 500, Washington, DC 20006.

Q. Have you submitted testimony previously in this docket?

A. Yes. I filed Affirmative Testimony in Phase 2 of this docket on behalf of Vote Solar. In that testimony, I provided an overview of the economic and policy issues relevant in assessing the economic value of solar distributed generation ("DG") exported to the Rocky Mountain Power ("RMP") electric distribution system in Utah, and I determined an amount in cents/kilowatt hour (¢/kWh) for the value of exported Customer Generation ("CG") in RMP's service territory based on my analysis and that of the other Vote Solar experts.[1]

Q. Please summarize your professional background.

A. I am a Principal with the economic consulting firm of Bates White, LLC. I have worked for over 25 years on a wide range of issues concerning competition and regulation in the electricity industry, including transmission access, market power, market manipulation, cost recovery, market restructuring and design, distributed generation, and rates. I have prepared economic analyses and filed testimony in various state and federal jurisdictions analyzing the effects of energy policy on incentives and market outcomes. I have testified before the Federal Energy Regulatory Commission, the California Public Services Commission, and

[1] *See generally* Vote Solar, *Revised Affirmative Testimony of Carolyn A. Berry*, May 8, 2020 (hereinafter "*Berry Affirmative*").

the U.S. District Court for the District of South Carolina. I have an appreciation of a variety of industry perspectives, as I have worked inside a regulatory agency (Federal Energy Regulatory Commission), at an investor-owned utility (Pacific Gas & Electric Company), and as an economic consultant for regulatory commissions, state governments, regulated entities, and independent power producers. A copy of my curriculum vitae that includes a complete list of my testimony was attached to my Revised Affirmative Testimony on May 8, 2020.[2]

II. Assignment

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

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

Q. What is the purpose of your rebuttal testimony?

A. I have been asked to review and respond to the February 3, 2020 Direct Testimony filed on behalf of RMP and the March 3, 2020 Direct Testimony filed on behalf of the Utah Division of Public Utilities ("DPU").

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

[2] *Berry Affirmative*, Exhibit 1-CAB.

are introduced during discovery and trial. I also reserve the right to express additional opinions in response to any opinions or testimony offered by other parties in this proceeding.

III. Summary of Recommendations

Q. After reviewing the Affirmative Testimonies of RMP and DPU, what do you recommend to the Utah Public Service Commission ("Utah PSC" or "Commission")?

A. I recommend that the Commission reject five aspects of RMP's Export Credit Rate ("ECR") proposal and replace them with alternatives, as explained below.

1. **Time-Varying Rates.** RMP's proposal for a time-varying component in the ECR should be rejected for the following reasons:
    - It is inconsistent with other time-varying rates currently offered by RMP and will thus undermine the rationale for these rates;
    - RMP has provided no support for the relative magnitudes of the proposed time-varying rates;
    - The proposal has an inefficiently designed on-peak/off-peak hour and period structure that does not coincide with system peaks and will change from year-to-year;
    - The proposal will cause CG customers to shift demand to hours of system peaks because it does not account for incentives created by the delivery rate;
    - The proposal will incentivize CG customers to defect from the grid rather than to integrate efficiently into the grid; and

- The proposal is untested and therefore unlikely to work as planned.

The Commission should adopt a single ¢/kWh rate for the ECR in this proceeding. The Commission should consider adopting a TOU rate for CG customers that would apply to both exports and deliveries at a future date after the Commission's overall TOU policy is more fully developed.

2. **Interval Netting.** RMP's proposal to net exports and deliveries on a real-time basis should be rejected for the following reasons:

   - It lacks simplicity and transparency—two principles of good rate design—because customers do not have access to real-time price information, and monthly volumes of exports and deliveries on monthly bills do not provide a connection to the timing of production and consumption behavior;
   - It does not promote economic efficiency because even if customers had all the needed price and quantity information, they are not currently able to respond to real-time price signals;
   - It will make it difficult for customers to understand their rates because customers generally understand rates and the associated quantity on an hourly basis within the context of a day, but under RMP's proposal CG customers will be subject to both an export price and a delivery price within the same hour and will be unable to determine the overall net hourly rate; and
   - It will change measured volumes of exports and deliveries in unknown ways adversely affecting new CG installations.

Instead, the Commission should adopt hourly netting and require RMP to provide CG customers with hourly energy export and delivery information through a web portal and on their bills. The combination of hourly netting and hourly data would provide easy-to-understand actionable price signals to customers and promote economic efficiency.

3. **ECR Updates.** RMP's proposal to update the ECR on an annual basis should be rejected. Annual updating should be rejected for the following reasons:

   - The proposal is discriminatory, as no other residential customer is subject to rates that change on an annual basis;
   - It introduces rate instability because rates could swing widely from year-to-year;
   - It will increase the administrative burden on the Commission, especially in light of the black-box modeling proposed by RMP to determine the ECR that is ripe for dispute and litigation; and
   - It will adversely affect the CG community by increasing risks and raising financing costs.

   The Commission should update the ECR with the same frequency that it updates rates for other residential and small commercial customers—that is, the frequency of its rate cases.

4. **Expiration of Export Credits.** The Commission should reject RMP's proposal to allow export credits to expire yearly. Export credits are the property of CG customers—earned legitimately—and should not be confiscated. Doing so creates ill will and incentivizes inefficient consumption of energy to avoid the loss of credits. It also penalizes customers who reduce energy consumption under demand-side management programs or for

environmental reasons. The Commission should allow CG customers to keep all credits earned and address RMP's concerns about the appropriate sizing of CG systems by implementing mandatory guidelines at the design and installation phase.

5. **Application Fee.** The Commission should reject RMP's proposed $150 application fee for all CG customers. The fee is not consistent with industry practice or with PacifiCorp's (RMP's parent company) practice, in other state jurisdictions. Moreover, RMP has not cost-justified the proposed increase in fees for Level 1 and Level 2 customers above those approved for Schedule 136 Transition Program customers. Instead of increasing the fee for Level 2 customers and decreasing the fee for Level 3 customers under the ECR, the Commission should make no changes to the application fees currently charged to Level 2 and Level 3 CG customers as charged under Schedule 136, and consider reducing the application fee for Level 1 customers to zero. Lower total fees will provide the right incentive to RMP to evaluate applications more efficiently by adopting more standardized and streamlined application processes.

IV. RMP's Proposal for a Time-Varying Export Credit Rate

Q. Please describe RMP's export rate proposal.

RMP's time-varying proposal for the ECR is set out in the Direct Testimony of Daniel J. MacNeil.[3] Currently, under the Schedule 136 Transition Program,[4] the ECR is a single rate, different for each customer class, which applies to all exports. It is set at 90% or 92.5% of

[3] RMP, *Direct Testimony of Daniel J. MacNeil*, Feb. 3, 2020, lines 167–229 (hereinafter "*MacNeil Direct*").

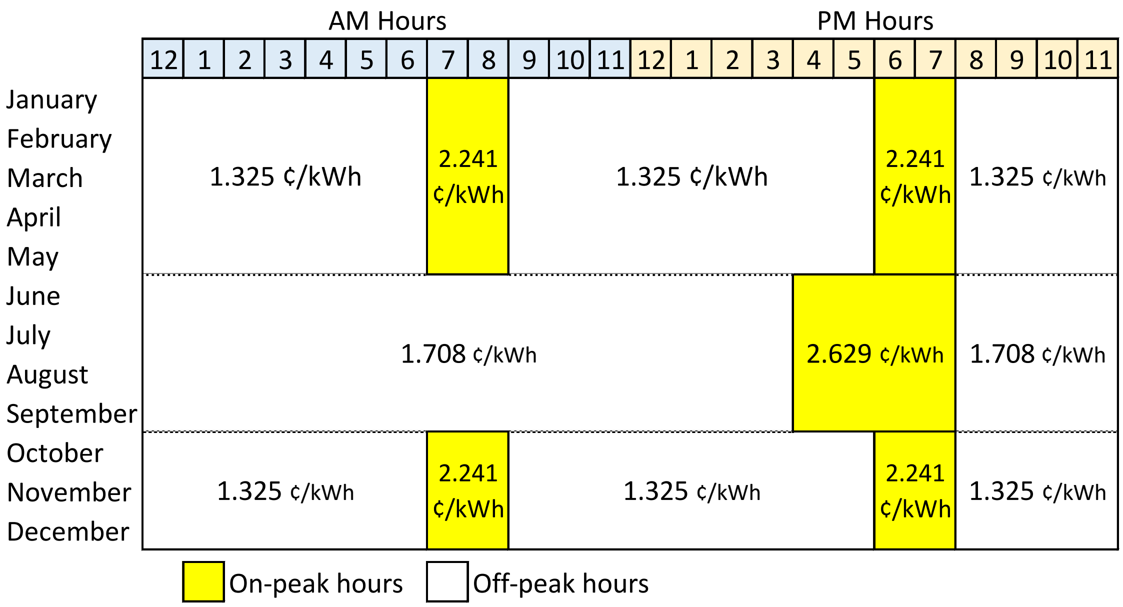
[4] See Vote Solar, *Revised Affirmative Testimony of Sachu Constantine,* May 8, 2020, lines 115–18 (hereinafter "*Constantine Affirmative*"), for an explanation of the Transition Program.

the average rate charged for energy consumption and ranges from 9.2 ¢/kWh for residential customers to 1.5 ¢/kWh for large commercial customers.[5] Mr. MacNeil proposes to change this structure from a single rate for each customer class to a single set of time-varying rates that will apply to all CG customer classes. For the time-varying rates, he proposes distinct ECRs for on-peak and off-peak hours and for the winter and summer periods. He defines the summer period as the months of June–September and on-peak hours within this period as 4-8 PM on weekdays, excluding holidays. All other hours in this period are defined as off-peak. He defines the winter period as October–May and on-peak hours within this period as 7-9 AM and 6-8 PM on weekdays, excluding holidays. All other hours in this period are defined as off-peak. Figure 1 illustrates the periods and the corresponding ECRs proposed by Mr. MacNeil for each hour of the day and month of the year for all CG customers.

[5] *Id*., note 25.

Figure 1: RMP Proposed Export Credit Rates, ¢/kWh

For weekdays, excluding holidays



Q. What is the purpose of time-varying rates?

A. One of the primary purposes of time-varying rates[6] is to incentivize customers to reduce consumption during on-peak hours and to shift consumption to off-peak hours.[7] RMP currently offers two residential schedules with time-varying rates: Schedules 2 and 2E (discussed further below). RMP's proposal for time-varying rates for CG customers would add another TOU rate schedule for RMP customers. RMP's proposed time-varying rate for CG customers differs from the Schedule 2 and 2E TOU rates in that it would apply to exports as opposed to deliveries. Regardless of the application to exports, the primary purpose of

[6] Time-varying rates are also referred to as time-of-use ("TOU") rates herein.

[7] A. Faruqui, R. Hledik, J. Palmer, The Brattle Group, *Time-Varying and Dynamic Rate Design*, Prepared for Regulatory Assistance Project, at p. 9, July 2012, https://www.raponline.org/wp-content/uploads/2016/05/rap-faruquihledikpalmer-timevaryingdynamicratedesign-2012-jul-23.pdf; James Sherwood, et al., *A Review of Alternative Rate Designs: Industry experience with time-based and demand charge rates for mass-market customers*, Rocky Mountain Institute, p. 45, May 2016, https://rmi.org/wp-content/uploads/2017/04/A-Review-of-Alternative-Rate-Designs-2016.pdf.

RMP's proposed time-varying export credit rate is to incentivize *consumption* behavior. This is because exports are a residual amount, equal to energy production less consumption and, once a solar system is installed, production is outside the customer's control. The production of energy from rooftop solar depends upon the amount of sunshine, not on customer decisions.[8] For a CG customer, reducing consumption (for a given amount of production) during on-peak hours will increase the quantity of exports during these higher-priced hours enabling to customer to capture increased revenues. Thus, TOU rates, whether they apply to deliveries or exports, function the same.

RMP witness Robert M. Meredith who also explains RMP's proposed ECR, states that "[d]ifferentiating the price of exported energy. . . .encourages customers to build and operate their systems in ways that are the most beneficial to the power grid."[9] Although customers may have some control over the design of their systems, the primary purpose of the TOU rate is to incentivize changes in consumption behavior. Mr. Meredith acknowledges that "customer generators can achieve more value from their system by shifting consumption to use more of their energy production during high output off-peak periods."[10]

Q. Please describe the current time-varying rate schedules offered by RMP to residential customers.

A. RMP currently offers two residential time-varying rates. Rate Schedule 2 is an optional rate offered to residential customers and referred to as a "time-of-day" rider. As a rider, it is

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[8] Customers may have some control over the original design of the solar installation that can affect the timing and magnitude of solar production. However, once the system is installed, production for the CG customer is almost exclusively a passive activity.

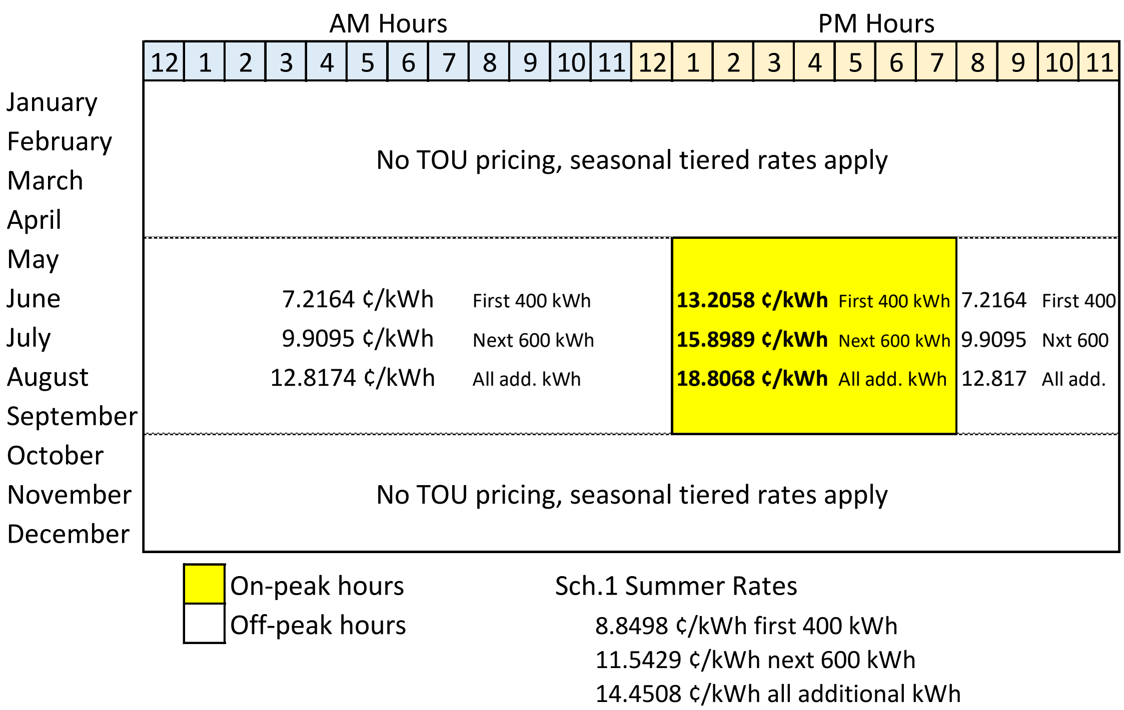
[9] RMP, *Direct Testimony of Robert M. Meredith*, Feb. 3, 2020, lines 75–77 (hereinafter "*Meredith Direct*").

[10] *Meredith Direct*, lines 86–92.

used in conjunction with residential Schedules 1 or 3 modifying the traditional tiered rates in these schedules upward in on-peak hours and downward in off-peak hours. The upward adjustment is 4.3560 ¢/kWh during on-peak hours. The downward adjustment is (1.6334) ¢/kWh in off-peak hours. This results in a 5.9894 ¢/kWh rate difference between on-peak and off-peak hours for each price tier. Figure 2 provides an illustration of the on-peak and off-peak periods and rates charged under the Schedule 2 time-of-day rider for residential customers taking service under Schedule 1.

Figure 2: RMP Schedule No. 2 Time-of-Day Rate ¢/kWh

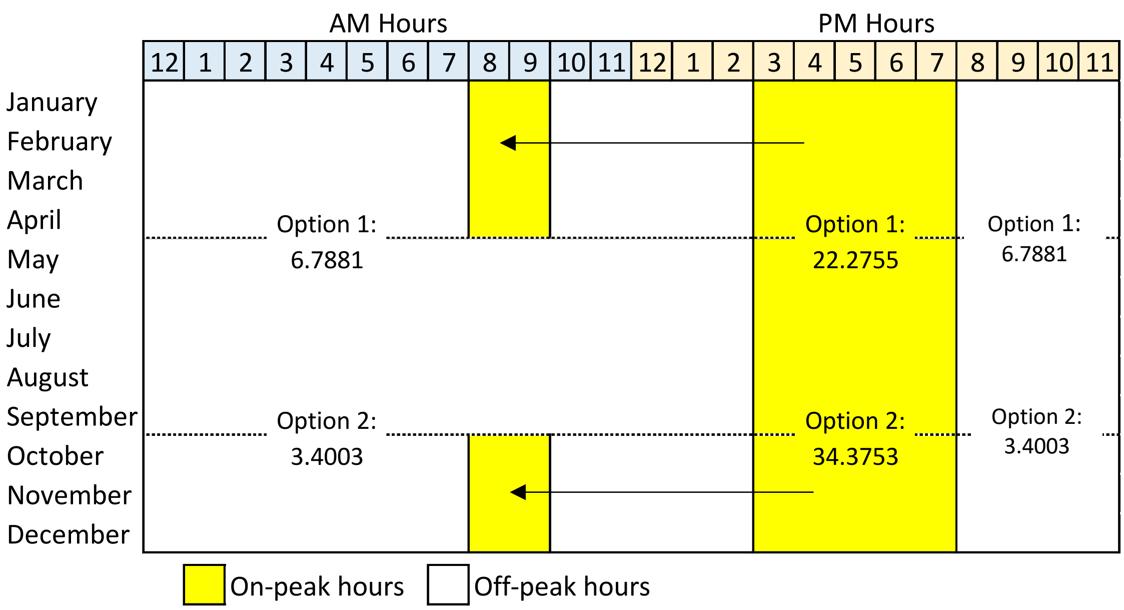
For weekdays, excluding holidays



Rate Schedule 2E is an optional electric vehicle ("EV") time-of-use temporary pilot rate. It was implemented in 2017 after in-depth rate design analysis conducted through a stakeholder process.[11] There are two rate options offered under Schedule 2E, one with a moderate on/off peak differential of about 3 to 1, and another with a more pronounced differential of about 10 to 1.[12] Figure 3 provides an illustration of the periods and rates charges under Schedule 2E by hour and by month.

Figure 3: RMP Schedule No. 2E Time-of-Use Pilot Option ¢/kWh

For weekdays, excluding holidays



Q. Are the current RMP TOU and proposed TOU export credit rates mutually consistent and reinforcing?

A. No. These rates are conflicting as I explain below.

[11] Exhibit 1-CAB, Rocky Mountain Power, *Direct Testimony of Robert M. Meredith*, (hereinafter "Meredith EV Testimony"), Utah Public Service Commission, Docket No. 16-035-36, lines 43–72, Jan. 1, 2017, https://pscdocs.utah.gov/electric/16docs/1603536/291434DirTestMeredith1-31-2017.pdf.

[12] *See* Rocky Mountain Power, *Tech Conference Slides: Electric Vehicle Time-of-Use Pilot*, Meredith, Utah Public Service Commission, Docket. No. 16-035-36, p. 4, February 16, 2017, https://pscdocs.utah.gov/electric/16docs/1603536/291795Slides-ElecVehTechConfMeredith2-16-2017.pdf

Q. Are Schedules 2 and 2E definitions consistent with RMP's proposed time-varying rate for CG exports?

A. No. They differ in several ways. First, the definition of the periods is different. Under Schedules 2 and 2E, the summer period is defined as May–September whereas under the proposed ECR, the summer period is shorter, defined as June–September. The ECR proposed shorter summer period disadvantages CG customers by reducing compensation for CG exports in May. Second, the definition of peak hours is different. Notably, the number of on-peak afternoon hours in the summer period is greater in Schedules 2 and 2E (5 or 7 hours) than in the proposed ECR (4 hours). Also, the morning peak hours in the proposed ECR start one hour earlier (at 7 AM) than the start of the morning peak in Schedule 2E (at 8 AM). These proposed ECR definitions disadvantage CG customers by reducing the number of hours with higher on-peak price compensation, and by shifting the definition of on-peak to hours with less solar production.

Q. How do the on/off peak ratios differ?

A. The on/off peak ratios in Schedule 2E are much larger (3.2 to 1, and 10.1 to 1) than the on/off peak ratios in the proposed ECR (1.6 to 1, and 1.5 to 1). There is general agreement, including by RMP, that a 2 to 1 (or higher) on-peak/off-peak ratio is needed to incentivize load shifting, which is the primary goal of TOU rates.[13] Yet, the on/off peak ratio proposed for the ECR is smaller than 2 to 1.

[13] Cross-Call, Dan, Becky Li, and James Sherwood, *Moving to Better Rate Design: Recommendations for Improved Rate Design in Ohio's PowerForward Inquiry*, Rocky Mountain Institute, p. 12–13, 2018, https://rmi.org/wp-content/uploads/2018/07/RMI_Better_Rate_Design_2018.pdf.

Q. What rate applies to CG customer deliveries?

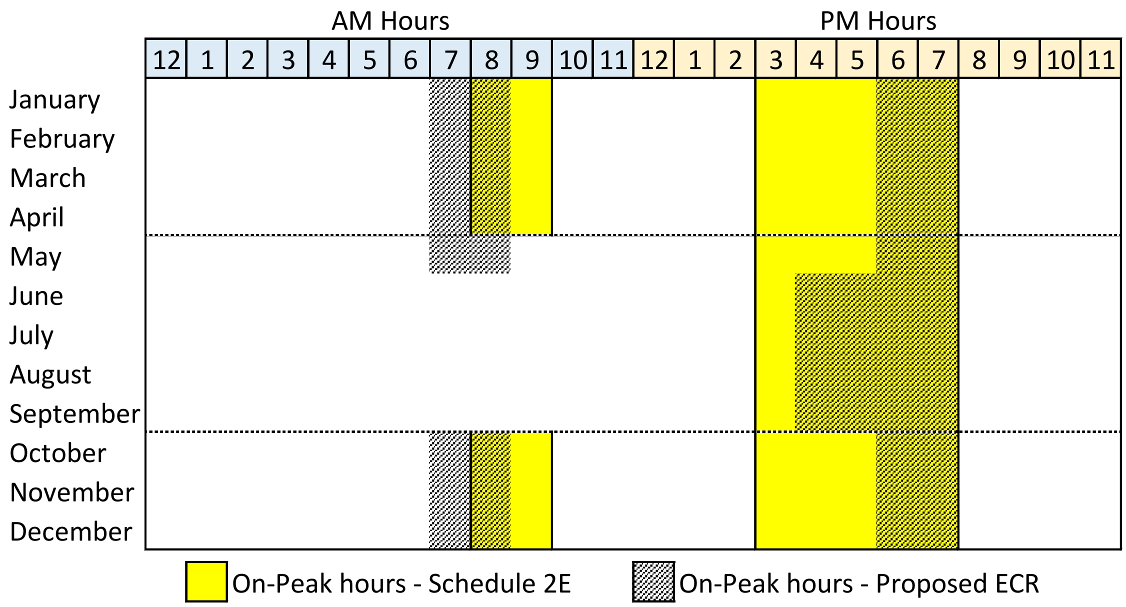
A. Mr. MacNeil's ECR proposal will keep delivery rates for CG customers unchanged at their current tiered rate schedules.[14]

Q. Are the consumption-shifting incentives created by Schedule 2, Schedule 2E, and Mr. MacNeil's proposed rate schedule for CG exports consistent?

No. During the winter months, the proposed rate for CG exports would incentivize customers to *increase* consumption during the hours of 3PM-5PM (because the ECR that applies to exports is set low during these hours incentivizing the CG customer to reduce exports by shifting consumption to these hours) whereas Rate Schedule 2E incentivizes customers to *reduce* consumption during these same hours (because the Schedule 2E TOU rate that applies to purchases is set high during these hours). The same conflicting incentives are also present in the morning hours because the definitions of on-peak and off-peak for Schedule 2E and CG customers do not coincide. Figure 4 shows the inconsistent definitions of on-peak and off-peak hours under Schedule 2E and the proposed ECR. On-peak hours under Schedule 2E are shown in yellow with an overlay of the proposed ECR on-peak hours in hatch marks.

[14] *MacNeil Direct*, lines 130–34.

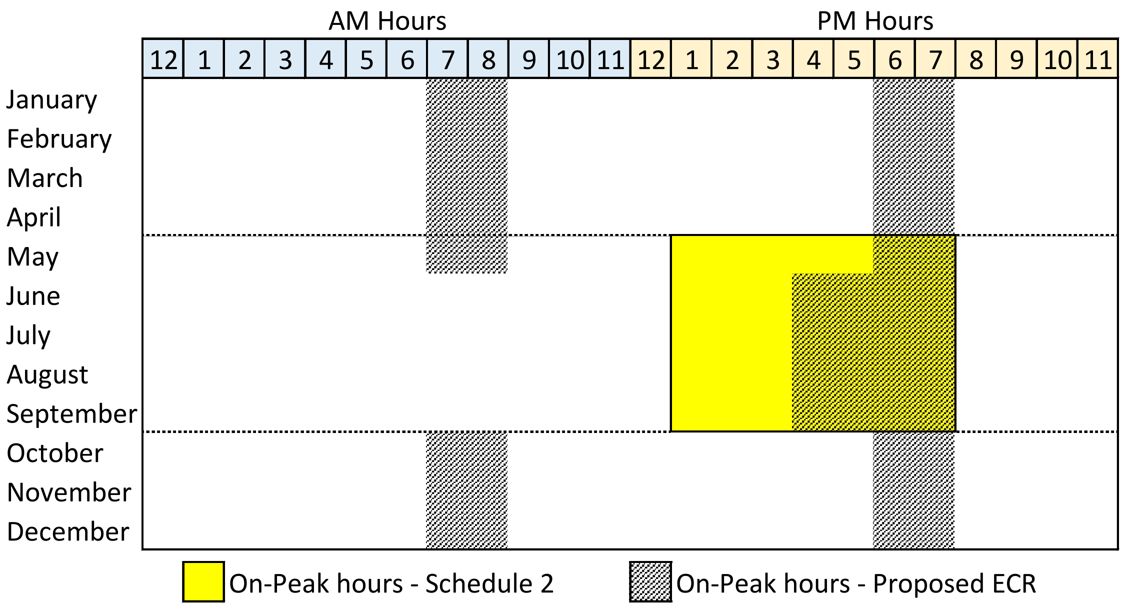
Figure 4: On-Peak Hour Comparison: Schedule 2E and Proposed ECR
For weekdays, excluding holidays



Mr. MacNeil explains that the definition of peak hours for the ECR was chosen, "to maintain consistency with Schedule 2."[15] However Schedule 2 encourages customers to reduce consumption during the hours of 1PM–3PM in the summer period (because the time-of-day rate is set high during those hours), whereas the proposed rate for CG exports encourages customers to do exactly the opposite because the ECR is set low during those hours incentivizing the CG customer to increase consumption to reduce exports. Figure 5 shows the inconsistent definitions of on-peak and off-peak hours under Schedule 2 and the proposed ECR.

[15] *MacNeil Direct*, line 205.

Figure 5: On-Peak Hour Comparison: Schedule 2 and Proposed ECR
For weekdays, excluding holidays



Adoption of inconsistent TOU rate schedules will undo the consumption-shifting benefits that they were designed to achieve.

Q. What are the benefits of TOU rates?

A. Time-varying rates and the definition of on-peak hours is a system concept related to peak loading on a utility's system. Time-varying rates are beneficial because they give customers the incentive to shift consumption away from hours that the system is heavily loaded, thereby reducing congestion, increasing generation efficiency, and reducing the need for future investment in generation, transmission, and distribution to satisfy peak demand. Mr. Meredith explained this very concept in testimony that he sponsored in Docket No. 16-035-36, supporting the TOU rates for electric vehicles: "A time of use rate should induce customer behavior that promotes economic efficiency. A change in customer behavior that keeps usage away from the times of the Company's peaks, if adopted by a sufficiently large number of customers over a sufficiently long period of time, may yield benefits for the Company's system and allow it to avoid or defer making investments."[16]

Q. How were the on-peak and off-peak hours and periods determined for the Schedule 2E electric vehicle pilot rate, and how does that compare to the method used by Mr. MacNeil to determine those hours and periods for the proposed CG export rate?

A. On January 31, 2017 in Docket No. 16-035-36, the EV proceeding, Mr. Meredith submitted direct testimony to support the determination of on-peak hours and periods for the TOU rate. He explained that the determination of on-peak hours and periods was made by "examin[ing] the timing of both system coincident and distribution coincident peaks over the last five class cost of service studies filed with the Commission . . . and identify[ing] time periods that capture the vast majority of those peaks for both seasons. The proposed on-peak periods include the timing of 94 percent of the peaks."[17] In contrast, the on-peak hours and periods proposed by Mr. MacNeil, and supported by Mr. Meredith, for the TOU export rate in *this* ECR proceeding are based on historical energy prices in the Energy Imbalance Market ("EIM") for the 36-month period starting in October 2016 and ending in October 2019,[18,19] not on system coincident and distribution coincident peaks as they should be.

[16] Exhibit 1-CAB, Meredith EV Testimony, lines 107–11.

[17] Exhibit 1-CAB, Meredith EV Testimony, lines 229–37; *see also* Rocky Mountain Power, *Tech Conference Slides: Electric Vehicle Time-of-Use Pilot*, Meredith, Utah Public Service Commission, Docket. No. 16-035-36, p. 4, February 16, 2017, https://pscdocs.utah.gov/electric/16docs/1603536/291795Slides-ElecVehTechConfMeredith2-16-2017.pdf.

[18] *MacNeil Direct*, lines 86–95.

[19] Mr. MacNeil determines on-peak hours for the ECR by setting an 8PM cutoff point, and then selecting the four highest priced hours in the day. *MacNeil Direct*, lines 198-205. Additionally, the hourly prices were examined for the month of May and were determined to align better with the winter period, so the month May was defined as a winter month. *MacNeil Direct*, lines 218–22.

Q. Did Mr. MacNeil provide any justification for limiting the number of on-peak hours to four in the proposed ECR?

A. No. That appears to be an arbitrary choice.

Q. Do you agree with the method that Mr. Meredith proposed in testimony in the EV proceeding to determine on-peak hours and periods, that is based on system and distribution coincident peak loads?

A. Yes. This method promotes short and long-term system efficiency—the goal of TOU rates—as Mr. Meredith himself explains in his EV testimony.[20]

Q. Do you agree with Mr. MacNeil's use of historical energy prices in the EIM to define on-peak hours and periods in this proceeding?

A. I strongly disagree with this approach. As I explained above, time-varying rates and the definition of on-peak hours is a system concept reflecting peak loading on a utility's system. Time-varying rates are beneficial because they give customers the incentive to shift consumption away from hours that the system is heavily loaded, thereby reducing congestion, increasing generation efficiency, and reducing the need for future investment in generation, transmission, and distribution to satisfy peak demand. Although Mr. Meredith states that the ECR proposal will, "contribute to a more efficient power grid and lower net power costs for all customers,"[21] he fails to mention that the proposed ECR on-peak hour

[20] Exhibit 1-CAB, Meredith EV Testimony, lines 107–11.

[21] *Meredith Direct*, lines 91–92.

definitions are not based on the methodology—system and distribution coincident peaks—that he previously supported as necessary to achieve this result.

Mr. MacNeil justifies the proposal for the ECR with the argument that, "[d]istinguishing periods with different value ensures that exporting customers receive appropriate compensation consistent with the value they provide to the system."[22] Mr. MacNeil's compensation-based rationale does not support his proposal. Appropriate compensation can be accomplished with a single rate. Mr. MacNeil's has no credible rationale for the definition of ECR on-peak hours and periods. Using historical spot energy prices, as opposed to system loading, to define on-peak hours and periods misses the whole point of time-varying rates, which is to provide an incentive to customers to shift consumption to reduce the overall costs of the system.

Q. Please explain how RMP's time-varying rate proposal for CG exports undermines the goal of reducing peak demand.

A. As explained above, the definitions of on-peak and off-peak are inconsistent across RMP's various time-varying rate schedules, including the proposal for CG exports. These inconsistent definitions will create opposing incentives that will undermine the overall goal of all time-of-use rates to shift consumption to lower load hours. That said, RMP's time-varying rate proposal for CG exports has an even deeper, more fundamental flaw because it ignores the incentives created by the delivery rate. A CG customer will face, under RMP's proposal, dramatically different prices for exports and deliveries. Under Schedule 1, for

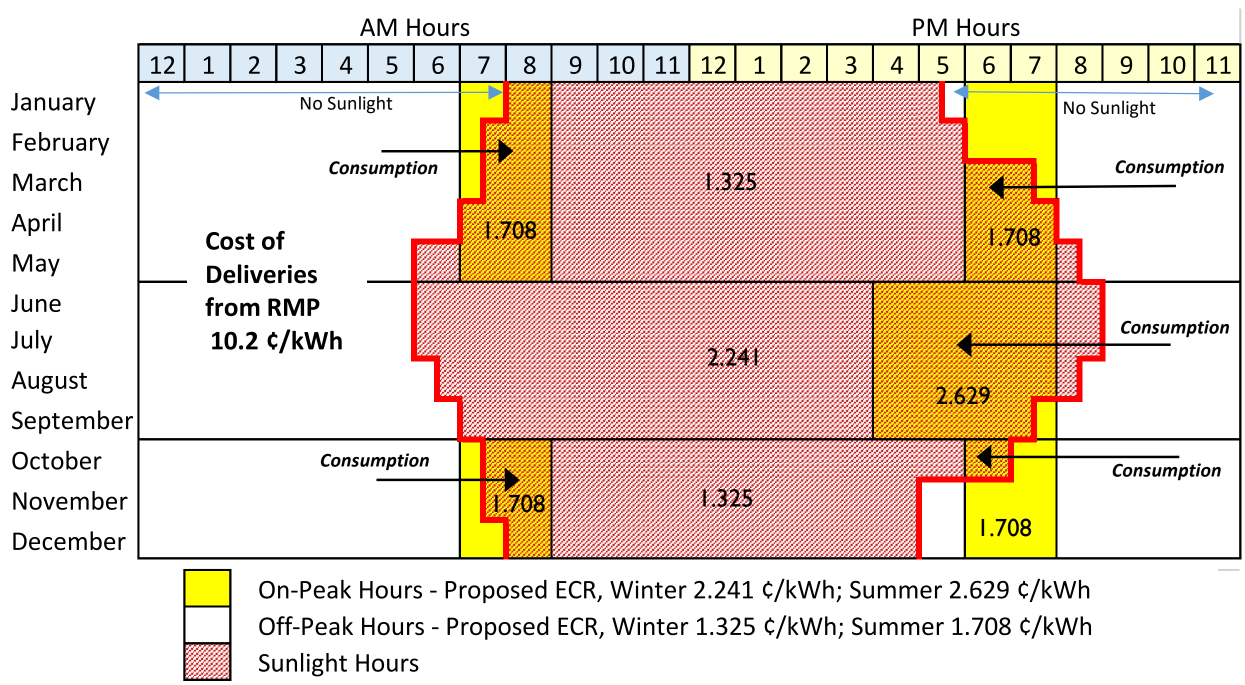
[22] *Meredith Direct*, lines 173–75.

example, the customer will face average export prices of 2.413 ¢/kWh during on-peak hours and 1.490 ¢/kWh during off-peak hours, and an average delivery price of 10.2 ¢/kWh during all hours. The overwhelming incentive created by this set of prices will be for the customer to shift consumption from hours that the customer has deliveries from RMP to hours that the customer has solar production, regardless of whether that solar production occurs in on-peak or off-peak hours. Under the proposed ECR, the CG customer receives so little compensation for exports relative to the price s/he must pay for deliveries that the customer can substantially improve the value of the solar investment by matching consumption to production and exporting as little as possible, again, irrespective of the on-peak/off-peak definition. Thought of in another way, the CG customer values her/his own production at 10.2 ¢/kWh, the cost s/he avoids by not taking and paying for RMP deliveries. Since this value far exceeds both the on-peak and off-peak export prices, s/he is better off reducing exports to the smallest amount possible, regardless of the effect on the overall RMP system.

Figure 6 is an annotated version of Figure 1 that illustrates the incentives created by Mr. MacNeil's ECR proposal. Instead of charging an electric vehicle at night, a CG customer would be better off charging it right after work, particularly from April to August when the sun is up until at least 8 PM—*during peak load hours*. Likewise, instead of running the dishwasher or clothes dryer early in the morning or late at night, the CG customer would be better off waiting until after the sun comes out in the morning or before it goes down at night, to do these activities—*precisely during times of peak system load*. By failing to consider the incentives created by *all* the rates faced by a CG customer, Mr. MacNeil's proposal will increase consumption during hours of peak load on RMP's system, increasing system inefficiencies by increasing generation costs and the need for additional infrastructure investment. Mr. MacNeil's proposal will not, "contribute to a more efficient power grid and lower net power costs for all customers"[23] as claimed by Mr. Meredith.

Figure 6: RMP Proposed Export Credit Rates, Consumption Shifting Incentives

For weekdays, excluding holidays



Q. Will RMP's ECR proposal create an incentive for CG customers to install battery storage systems?

A. Yes. There will be a significant incentive for CG customers to install battery storage systems in order to avoid exports to the grid. When the difference in rates between deliveries and exports is high, CG customers will want to direct their production to self-consumption and even small amounts of storage can reduce their energy costs significantly. CG customers

[23] *Meredith Direct*, lines 91–92.

are incentivized to buy at least as much storage as the difference between export and delivery prices allow. As the costs of solar and batteries both decline, this incentive will increase over time.

Q. Is installing battery storage to avoid exports efficient?

A. Under RMP's proposed ECR, installing batteries to avoid exports is optimal for the CG customer; however, it may not be optimal for the system. CG customer battery storage could be used to provide exports to the system during peak load hours that would reduce the costs of generation and the need for additional system infrastructure. A well designed time-varying ECR should create incentives and outcomes that benefit both the CG customer and the grid. RMP's time-varying ECR proposal does not do this.

Q. Will RMP's ECR proposal optimize the operation of the CG customers' solar plus battery systems?

A. No. Investment in battery storage can provide a host of benefits in the management and delivery of energy to the CG customer, as well as to the grid operator. Optimally, rates should be set up to encourage CG customers to charge their batteries during the mid-day off-peak hours when solar production is high and system loading, congestion, and costs are low and to provide the stored energy back to the grid during peak hours when system loading, congestion, and costs are high. As both rooftop and utility scale solar penetration increases, charging batteries mid-day would prevent oversupply and reduce potential curtailment. The RMP ECR proposal fails to optimize this behavior from CG customers in two related ways.

1) Reduced Exports

First, the very low export credit, even the average "peak" proposal of 2.413 ¢/kWh, relative to the delivery price of 10.2 ¢/kWh, will dis-incentivize any exports of solar or stored energy, even when they could benefit the grid.

2) Inefficient Size

Second, both the solar and the battery installation will be sized to optimize CG customer consumption, not integration with the grid. This may result in undersizing of both, when grid benefits are not considered in the setting of ECR rates.

RMP's ECR proposal may also incentivize the inefficient oversizing of the battery if the CG customer decides to permanently disconnect itself by defecting from the grid and no longer taking RMP service. Many potential benefits will be lost if CG customers install battery storage solely for their own use to defect from the grid. It will result in spreading fixed costs over a smaller pool of ratepayers, the deprivation of services that CG customers' solar and battery system could offer the grid, and duplicative investment in infrastructure. Integrating the operation of CG solar with battery storage into the system improves overall efficiencies and lower costs for all customers. RMP's ECR proposal fails to consider how CG generation is used with complementary technologies and the implications of that for ratemaking.

Q. Does temporary "islanding" provide benefits?

A. Yes. The ability to island, or temporarily disconnect one's load from the grid and self-provide electricity, allows customers to maintain electric service during emergencies when the broader grid goes down. With the cost of solar and batteries declining rapidly, it is economically feasible, or will be soon, for some customers to reliably self-supply their energy needs. The ability to island is also a tool that can help the grid operator manage the operation of the distribution grid, increasing grid resilience for all customers. The collaboration of RMP and CG customers and integrated planning and operation of their respective assets will result in greater overall benefits than if each considers their own interests alone.

Q. Will the incentive to island still be there even if the Commission adopts an ECR that is not time-varying?

A. Yes. It is the size of the export rate in relation to the delivery rate that matters for customer incentives. As I explained above, a CG customer will value its own production at the rate s/he can avoid by reducing deliveries (currently 10.2 ¢/kWh on average). An export rate that is significantly below the delivery rate, say 1.5 ¢/kWh, creates a dichotomy. Production used for consumption is worth 10.2 ¢/kWh, whereas production used for exports is worth 1.5 ¢/kWh. The CG customer is better off avoiding exports altogether. RMP's proposed sharp decline in the ECR from 9.2 ¢/kWh to an average of 1.5 ¢/kWh will still create the incentive to defect, even if the ECR rate was not time varying.

Q. What does DPU witness Mr. Robert A. Davis assert about the steep proposed decline in the ECR?

A. Mr. Davis acknowledges that there is a steep decline of 83% in the ECR proposed by Mr. MacNeil, but citing to the stipulation in Docket No. 14-035-114 as establishing a structure for gradualism, he concludes that, "no actual customer is likely to experience the immediate and dramatic reduction in compensation rates the eighty-three percent reduction [in the ECR] would otherwise suggest."[24]

Q. Do you agree with Mr. Davis?

A. I agree that no individual customer will experience an 83% decline in the ECR since Schedule 135 and 136 rates are grandfathered; however, I disagree that the 83% decline in the ECR does not violate the principle of gradualism.

Q. Will an 83% decline in the ECR negatively impact CG customers and industry as a whole?

Yes. Although current Schedule 135 and 136 customers will not be directly affected by the dramatic rate change, there will be an adverse effect on future CG customers and on the industry as a whole. The sharp decline in rates under RMP's ECR proposal will create inequality and dramatic rate disparity among similar groups of CG customers. Similarly situated CG customers that install systems at about the same time, some just before the end of the Transition Period and others immediately after, will end up being compensated for exports at very different rates. Gradual changes in rates guard against such rate disparities. Mr. Davis ignores the sudden and dramatic impact such a rate decrease would have on producers, installers, and service providers in the CG solar community. The dramatic rate shock would disrupt the industry, causing a decline in growth, performance, and jobs that could be avoided with gradual changes in rates.

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[24] DPU, *Direct Testimony of Robert A. Davis*, March 3, 2020, lines 439–41 (hereinafter "*Davis Direct*").

Q. Is it prudent to conduct a pilot of proposed TOU rates before implementation?

A. Yes. The success of any TOU proposal is based on the ability to change consumption behavior through rates. Mr. MacNeil[25] and Mr. Meredith[26] have made assumptions about how CG customer behavior will change under RMP's proposed time-varying ECR but have not put forth any evidence that CG customers will behave as assumed. In fact, the analysis of the basic incentives that I have provided above strongly indicates that CG customers will *not* behave as they assume. In the context of RMP's TOU rates for electric vehicles, significant resources have been invested in the creation and deployment of a pilot to gauge customer behavior. Five workshops were held where the "core principles of the pilot, goals of the pilot, features of the pilot, time of use periods, and rate design" were discussed.[27] As explained by Mr. Meredith in his EV testimony, "[t]he workshop sessions were very productive and engaging. The different stakeholder groups in attendance were thoughtful and provided good recommendations for the pilot. The Company's EV TOU Pilot proposal is far more robust than it would have been absent the sessions and the valuable input shared by the different parties."[28] The same approach should be used for any proposed ECR TOU rates.

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[25] *MacNeil Direct*, lines 168–77.

[26] *Meredith Direct*, lines 73–95.

[27] Exhibit 1-CAB, Meredith EV Testimony, lines 66–67.

[28] *Id.* at lines 69–72.

Q. Does RMP's ECR proposal violate principles of good rate design?

A. Yes. Principles of good rate design have been written about extensively.[29] These include, among others: (i) the concept of gradualism for changes in rate design; (ii) rate stability, simplicity and transparency; (iii) customer access to data to make informed decisions; (iv) non-discrimination among customers within and between customer classes; (v) promotion of economic efficiency; and (vi) rates should be forward looking, that is, should reflect long-term energy infrastructure goals and state/local policy objectives. RMP's ECR proposal fails with respect to all these principles.

Regarding the proposed rate itself, RMP's proposal to slash the export rate by 83% fails on the principle of gradualism. The sudden rate change, as explained above, creates intra-class rate disparities and adversely affects producers, installers, and service providers in the CG solar community. The proposed rate also fails on the principle that rates be forward-looking because the ERC based on historic prices that almost certainly will not be applicable in future years. Moreover, the historic prices do not anticipate grid modernization and technological changes that will allow, for example, CG solar to be paired with batteries and serve as a grid asset that promotes system efficiency.

The time-varying aspect of RMP's ECR proposal fails on the non-discrimination principle because it mandates a time-varying rate for CG customers when all other time-varying rates

[29] *See, e.g.*, Advanced Energy Economy, *Rate Design for a DER Future, Designing rates to better integrate and value distributed energy resources*, January 22, 2018, https://info.aee.net/hubfs/PDF/Rate-Design.pdf; Lazar, J. and Gonzalez, W., *Smart Rate Design for a Smart Future*, Montpelier, VT: Regulatory Assistance Project, July 2015, https://www.raponline.org/wp-content/uploads/2016/05/rap-lazar-gonzalez-smart-rate-design-july2015.pdf; James Sherwood, et al., *A Review of Alternative Rate Designs: Industry experience with time-based and demand charge rates for mass-market customers*, Rocky Mountain Institute, p.45, May 2016, https://rmi.org/wp-content/uploads/2017/04/A-Review-of-Alternative-Rate-Designs-2016.pdf.

offered by RMP are optional. The time-varying aspect of RMP's ECR proposal also violates the principle of economic efficiency because it is not based on system and distribution coincident peaks and thus, will not promote the efficient use and expansion of RMP's electric system. Additional violations of good rate design principles associated with the various aspects of RMP's ECR proposal are identified in the following sections.

Q. How should a time-varying rate for CG exports be designed?

A. A TOU rate should be designed to achieve a defined set of objectives. For example, the core principles in the design of the EV TOU pilot rate included "encouraging electric vehicle adoption, minimizing cost shifting, promoting economic efficiency, ease of use/customer acceptance, and gaining a better understanding of electric vehicle charging behavior."[30] A similar set of principles would be appropriate for the design of a TOU rate for CG customers—because the Commission's goals for a TOU rate should be similar for both EV and CG customers.

A TOU rate for CG customers must consider the full set of incentives that drive consumption behavior since the purpose of a TOU rate is to incentivize the shifting of consumption away from hours of peak demand. Aligning CG customer consumption incentives would most effectively be done by designing a TOU rate that applied to both exports and deliveries.

The design of a TOU rate for CG customers must also be done in coordination with other TOU rate schedules so that the incentives created work in a mutually supporting and integrated way. The design must also consider the implications for CG customers that own

[30] *Meredith Direct*, lines 89–92.

electric vehicles or battery storage and future changes in market structure such as aggregation of CG energy resources, that will allow the provision of grid services that include imbalance energy, reactive supply, voltage control, or backup power.

V. RMP's Netting Proposal

Q. What is netting as it relates to CG exports?

A. In any given interval of time, a CG customer can both export energy to the grid and receive deliveries of energy to their location. Netting is adding these two amounts together to get one quantity that is either an export or a delivery in the interval.

Q. Please describe RMP's netting proposal.

A. Mr. Meredith proposes to use a very small interval, based on real-time energy measurements, to determine one quantity that is either an export or a delivery, and then to add together all the quantities of each type to determine monthly export and delivery quantities to use for billing purposes.[31] He refers to this as "no netting." I will refer to RMP's proposal as "real-time netting" because the meter data must be measured at some interval even if small.

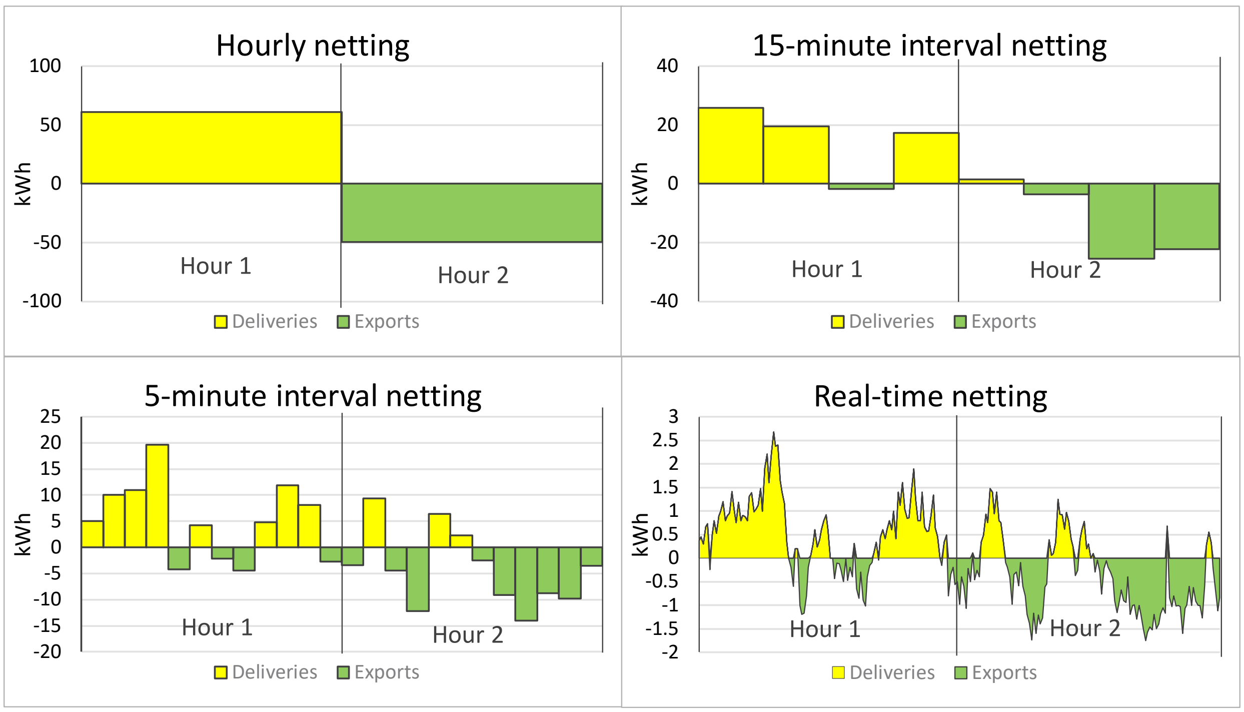
Q. Can you provide an example of netting at different intervals?

A. Yes. Figure 7 is an illustrative example of netting at different intervals. Under hourly netting, the customer faces one quantity and one price in each hour. When quantities are netted on a 15-minute basis, the CG customer must evaluate four different quantities and

[31] *Meredith Direct*, lines 101–05.

one or two prices in each hour depending upon whether that quantity is an export or delivery. 5-minute netting requires the CG customer to evaluate 12 quantities and multiple prices each hour. Under real-time netting, the CG customer would be required to evaluate hundreds of quantities and their associated prices in each hour.

Figure 7: Netting Interval Comparison[32]



Q. Do you agree with Mr. Meredith's real-time netting proposal?

A. No. Mr. Meredith states that one of the benefits of his proposal is that it "sends a price signal for customer generators to align their usage with their generation output."[33] Mr. Meredith does not define or explain this supposed "price signal." Even if defined, for the

[32] The real-time netting interval as shown if Figure 7 is based on 30-second intervals. Netting based on a one-second interval would result in 30 times more quantity data points.

[33] *Meredith Direct*, lines 112–13.

price signal to work, CG customers would need to be able to see the signal on a moment-by-moment basis, and then have the ability to respond to it. CG customers have neither access to real-time information, nor the capability to manage consumption on a moment-by-moment basis.

Under RMP's ECR proposal, there are four different prices for exports. The export price in any given hour will depend upon hour and month (on-peak or off-peak). CG customers also face multiple prices for deliveries. Schedule 1 customers, for example, are charged four different prices for deliveries depending on the month (on-peak or off-peak), and the total cumulative usage during the month (different rates apply to each tier of consumption). All these prices are relevant for a CG customer's energy usage and exports. If quantities are netted on an hourly basis then one price will apply in each hour, one of the export prices or one of the delivery prices, to the hourly quantity. If quantities are netted on a real-time basis, then up to two (and possibly three) prices would apply in each hour, and they would be applied to unknown quantities of exports and deliveries in that hour.

Customers cannot currently use moment-to-moment data as Mr. Meredith implies.[34] An hour is about the smallest period of time that energy production/consumption data is useful to customers to put that information into the context of a day. For example, if a customer receives information about the amount of exports and deliveries in a 5-minute, or 15-minute interval, s/he would likely not know how to adjust consumption, because this granular information is not relatable to total exports and deliveries over the course of the day and

[34] Customers will in the future be able to use moment-to-moment data with advancements in technology and deployments that allow automated responses of customer generation resources and consumption.

thus, not helpful for the timing of energy-consuming tasks like running the dishwasher or clothes dryer.

Under real-time netting, even if price information and the total quantity of exports and deliveries were known for each hour, that information would not be enough to guide customer decision-making. The customer would still need to compute the value of exports and the cost of deliveries to figure out whether s/he is owed amounts or owes amounts in that hour and then how to adjust consumption behavior to optimize that calculation. Real-time netting is not transparent or understandable for the typical consumer.

Under hourly netting, the price and quantities are much more transparent and actionable. The CG customer will have to consider only one of each. If CG customers are provided information about the quantity of exports or deliveries, they can readily both adjust consumption in the context of their day, week, or month, and understand the financial impact. As explained by Vote Solar witness, Mr. Sachu Constantine, "[u]nder an ECR, the customer must understand how production would relate to in-home consumption throughout each day within each month"[35] because this will determine net charges or compensation for exports and deliveries. Real-time netting will not provide this understanding. But hourly netting will.

Q. Do CG customers have access to production, consumption, export, and delivery data?

A. CG customers typically have access to production data but do not have access to energy consumption data; therefore, it is only through information provided by RMP that a CG

[35] *Constantine Affirmative*, lines 396–97.

customer can learn about quantities of exports and deliveries. RMP currently provides customers with usage data at a monthly level on the monthly basis only. Thus, CG customers have no information about the timing of exports and deliveries in the hours throughout the month. Without more granular information, a CG customer does not know what prices apply in each hour and thus has no actionable price information.

Q. Could CG customers respond to real-time information if they had it?

A. No. Even if CG customers had access to price and quantity information on a real-time basis, it would not be actionable. Currently, customers, for the most part, cannot align their energy usage on a moment-by-moment basis by adjusting air-conditioners, clothes dryers, or other energy intensive appliances or uses.[36] However, if RMP makes hourly export and delivery information available to all customers with Automated Meter Reading ("AMR") capable meters, then this information used in conjunction with hourly netting would provide actionable price signals to CG customers.

Q. What is Mr. Meredith's position on using real-time netting in the bill calculation?

A. It is Mr. Meredith's opinion that "using total exported energy and total delivered energy in the billing calculation is a simpler concept to explain to customers than netting over each 15-minute interval."[37]

[36] One exception is RMP's Cool Keeper program that uses a device installed outside near the air-conditioning unit to reduce operation of the unit or to cycle the unit on and off during select summer days. *See Cool Keeper*, Rocky Mountain Power, available at https://www.rockymountainpower.net/savings-energy-choices/home/cool-keeper.html.

[37] *Meredith Direct*, lines 126–28.

Q. Do you agree with Mr. Meredith's position that real-time netting is an easier concept for customers to understand?

A. No. The concept of netting is the same. Mr. Meredith would simply apply it to a different sized interval. If just the two amounts are shown on the bill—total monthly deliveries and total monthly exports—regardless of whether those amounts are computed using real-time or hourly netting, then the bill is the same in both cases. The real problem is the lack of information on the customer's bill. Customers can best understand the netting concept if they can see the export and delivery data and then correlate that information to their solar production and energy consumption behavior. A flood of real-time data would be confusing; however, access to hourly netted data through, for example, a web portal and on their monthly bills, will allow CG customers to evaluate and understand their bills, increasing transparency and reducing billing questions and disputes.

Q. Will real-time netting adversely affect evaluations for new solar projects?

A. Yes. To accurately assess new rooftop solar projects, estimations of export and delivery quantities are key. These estimations can vary significantly by location. There is no experience or data associated with real-time netting available to solar companies to make cost and revenue estimates for new CG customers. Lack of cost and revenue information will increase the uncertainty around the financial assessment of new installations increasing the risk associated with new investments. The greater the risk associated with rooftop solar investment, the lower the viability of new projects.

Q. What is Mr. Meredith's position on the administrative burden of real-time netting?

A. Mr. Meredith explains that even though the billing process for 15-minute netting can be automated (thus reducing the administrative burden), "there is still some backend manual work that is required to accurately bill customers,"[38] when there are issues with the 15-minute interval data. He concludes that the "proposed program which has no interval netting would avoid this added workload."[39]

Q. Do you agree with Mr. Meredith's position that real-time netting will be less administratively burdensome for RMP?

A. No. He provides insufficient support to make that conclusion. First, Mr. Meredith provides no evidence that the potential data issues for interval data as used for CG customers are greater in number or more costly than the data issues and costs associated with any other customer data.[40] He has identified one potential cost associated with 15-mintue interval netting but acknowledges that "there is always the possibility of manual work with any bill."[41] His conclusion that "the likelihood of requiring manual intervention with relying on registers instead of profile netting is much less"[42] is untested since real-time netting for CG customers has never been used. Mr. Meredith has failed to support his position that real-time netting is less administratively burdensome than other programs.

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[38] *Meredith Direct*, lines 138–39.

[39] *Id.* at lines 142–43.

[40] Exhibit 2-CAB, *Response to Vote Solar Data Request 13.1-5(1)*, RMP's Responses to Vote Solar 13th Set Data Requests (June 11, 2020).

[41] Exhibit 2-CAB, *Response to Vote Solar Data Request 13.1-4(2)*, RMP's Responses to Vote Solar 13th Set Data Requests (June 11, 2020).

[42] *Id.*

Q. Has Mr. Meredith done an analysis of export volumes, and what does he conclude?

A. Yes. Mr. Meredith obtained data for Schedule 136 Transition Program customers in 2019 and computed the amounts of exports that occurred under 15-minute netting and the amounts of exports that would have occurred under real-time netting. He concludes that real-time netting increases the measured volume of exports by only a small amount. [43]

Q. Please explain is analysis in more detail.

A. Mr. Meredith calculated export volumes, by customer, for Schedules 1, 2, 3, 6, 6A, 8, and 23 CG customers that supplied exports under the Schedule 136 Transition Program in 2019. He provides four pieces of data for each customer in each month: (1) total deliveries netted on a 15-minute basis; (2) total exports netted on a 15-minute basis; (3) total deliveries netted on a real-time basis; and (4) total exports netted on a real-time basis. Based on this data, he computes total exports in 2019 by rate schedule under 15-minute netting and under real-time netting, and associated percentages. He also estimates generation for each customer in each month using monthly PV performance data based on PV Watts to compute total estimated customer generation in 2019 by rate schedule.

Q. Do you have concerns with Mr. Meredith's analysis?

A. Yes. I have reviewed the data he provided for deliveries and exports on a 15-minute netted and real-time netted basis. In many instances, I have identified anomalies in the quantities. For example, in some cases, the 15-minute netted amount (for either exports or deliveries)

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[43] The analysis is found in *Meredith Direct*, RMP Workpapers RMM-2 (file name: "RMP WrkPrs RMM2 COMPEnrgTotalExprts15MntNettedExprts 2-3-2020.xls").

is larger than the total real-time amount over the same interval. Mathematically, this is impossible. In other cases, the real-time export and delivery amounts do not increase by the same amount when the 15-minute netted amount is separated into gross exported and delivered amounts. Mathematically, both exports and deliveries must increase by the same amount. I found this data anomaly in 82.6% of the observations.

Q. Did you raise your concerns in discovery, and if so, how did RMP respond?

A. Yes. RMP explained that the second relationship described above does not hold because "the time period over which usages are calculated using meter registers and the period of the profile that is netted on a 15 minute interval period may be slightly different. For example, meter registers may have been read for the period between 10:00AM October 4th through 11:00AM November 1st for usage and exports over that timeframe, while the profile data where 15 minute netting occurs for the bill is 12:00AM October 4th through 12:00AM November 1st."[44]

Q. Does RMP's explanation resolve the anomalies?

A. No. The data provided by Mr. Meredith for exports and deliveries is aggregated to the monthly level preventing an apples-to-apples comparison on a 15-minute basis from being done. RMP's discovery response indicates that months are measured differently—in other words, a month is not a month. Further, there are data errors in the analysis that were

[44] Exhibit 2-CAB, *Response to Vote Solar Data Request 13.2-6*, RMP's Responses to Vote Solar 13th Set Data Requests (June 11, 2020).

corrected by Mr. Meredith as part of the analysis. Since Mr. Meredith's analysis cannot be validated, it is not possible to have confidence in the numbers presented.

Q. What does Mr. Meredith conclude from his analysis of Schedule 136 Transition Program export volumes?

A. Mr. Meredith concludes that under real-time netting, the volumes of exports (and by definition, imports) would increase by about 1.8% relative to 15-minute netting, and thus, it makes "very little difference in the total volume of exported energy to be used for billing."[45]

Q. Does Mr. Meredith show the increase in deliveries under real-time netting?

A. No. He presents one estimate for CG deliveries but does not label it or show how the measurement of CG deliveries would change under real-time netting. Of course, changes in the measured amounts of CG deliveries are very important to the customer as those changes will substantially affect the CG customer bill.

Q. Can we rely on Mr. Meredith's conclusion?

A. No. The data he uses has anomalies and cannot be validated. Also, his conclusion is based on average amounts by rate schedule for one calendar year. The average may not be representative of the impact on individual customers; additionally, the year may not be representative of the impacts on CG customers going forward. Mr. Meredith's conclusion should therefore be ignored by the Commission.

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[45] *Meredith Direct*, lines 147–78.

Q. Does Mr. Meredith's real-time netting proposal violate principles of good rate design?

A. Yes. Mr. Meredith's proposal violates the principles of simplicity and transparency. Real-time netting is not simple because it would require a CG customer to follow its export and delivery quantities, and associated prices, to determine how to adjust consumption behavior. The proposal is not transparent because real-time export and delivery data is not available to CG customers. Also, it is unclear how the proposal will affect measured volumes of exports and deliveries and thus, how it will affect customer bills and the financial viability of CG investments. Lastly, Mr. Meredith's proposal does not promote the principle of economic efficiency. Real-time netting does not allow CG customers to make actionable consumption decisions and thus will not promote economic efficiency.

VI. RMP's Proposal to Update the ECR on an Annual Basis

Q. What is RMP's proposal regarding updates to the ECR?

A. Mr. MacNeil proposes "to update the export credit annually."[46]

Q. What rationale does Mr. MacNeil provide to support his position that the ECR be updated annually?

A. He provides two justifications. First, he states that annual updates "will ensure that the export credit payments continue to be consistent with the Company's avoided cost and that they are consistent with the non-firm nature of the output."[47] Second, he states that all CG

[46] *MacNeil Direct*, line 232.
[47] *Id.* at lines 232–34.

customers that take service under RMP's proposed ECR rate schedule will receive the same ECR regardless of the date they enter the program and that this will reduce "the administrative complexity of assorted vintages of export credit rates and on-peak/off-peak definitions."[48]

Q. Do you agree with Mr. MacNeil's first justification?

A. No. Mr. MacNeil's first justification for updating the ECR annually—to keep export credits consistent with costs—treats CG customers differently than other residential and commercial customers. He would adjust the ECR, a primary component of a CG customer's overall rate, every year for CG customers but adjust the rates for all other customers every four (or more) years as part of RMP's rate cases. There is no justification for treating CG customers so differently. This is discriminatory, violating a fundamental principle of good rate design. In addition, annual updating introduces rate uncertainty. CG customers could experience wide swings in their rates from year-to-year. This is burdensome and unnecessary. RMP's proposal to update the ECR each year fails to provide rate stability, a violation of another fundamental principle of good rate design.

Q. Regarding the first justification, how do you respond to Mr. MacNeil's point that annual updating is consistent with the non-firm nature of exports?

A. Labelling CG exports as "non-firm" mischaracterizes the nature of rooftop solar production. As explained by Dr. Milligan, rooftop solar exports contribute to resource adequacy, are available exclusively to RMP, and, as an as-available resource provide capacity value to

[48] *Id.* at lines 236–37.

RMP's system. Annual updating is not consistent with a resource that provides capacity value to RMP's system.[49]

Q. Do you agree with Mr. MacNeil's second justification?

A. No. Mr. MacNeil's proposal does not reduce administrative complexity. As opposed to the current structure of ECR vintages that depend upon the date a CG customer installs a system, Mr. MacNeil proposes to change the ECR, and the on-peak/off-peak definition, every year for every customer. This simply trades one type of complexity for another.

Q. Will annual updates likely increase administrative costs?

A. Yes. Annual updates will require the Commission to put in place a new regulatory process that is repeated every year. If ECR updates are contested or if the annual process is delayed, multiple ECR rate cases could be active at any given point in time. Moreover, it is likely that updates will be contested given RMP's proposed method to determine the ECR using the complicated, "black-box," GRID model. The results of this model are difficult, if not impossible for many customers, to replicate and validate.[50] Further, RMP's proposed method is based on historical energy price data that will not reflect the value of CG solar during the year that RMP's proposed rate is in effect. An annual process to update the ECR would be ripe for dispute and litigation, imposing a large additional burden on the Commission.

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[49] Vote Solar, *Rebuttal Testimony of Michael Milligan*, July 15, 2020, lines 553–61 (hereinafter "*Milligan Rebuttal*").

[50] *Milligan Rebuttal*, lines 89–96.

Q. How would annual updates of the ECR affect CG investments?

A. Export credit rates that vary,[51] potentially dramatically, from year-to-year will create uncertainty for the CG customers and the wider solar community, which will have a negative effect on CG investments. Annual updating will shift the price risk from RMP to individual CG customers when that risk could be more easily diversified, and at lower costs, by RMP who manages a vast portfolio of diversified assets across multiple states. Moreover, given that the current penetration levels of CG in Utah are low, the cost of assuming this price risk—as RMP does for non-CG customers in its rate base—is very low. This is not the case for the CG customer. For individual customers, the price risk poses a significant burden. The purchase of a solar system by an individual customer is a 20-year investment, typically part of a long-term financial plan. A fixed rate allows customers to manage the costs of this investment within the constraints of a monthly budget. Removing this price certainty by changing the ECR each year, will expose customers to potentially unmanageable price swings and removing, for many, rooftop solar as a possibility.

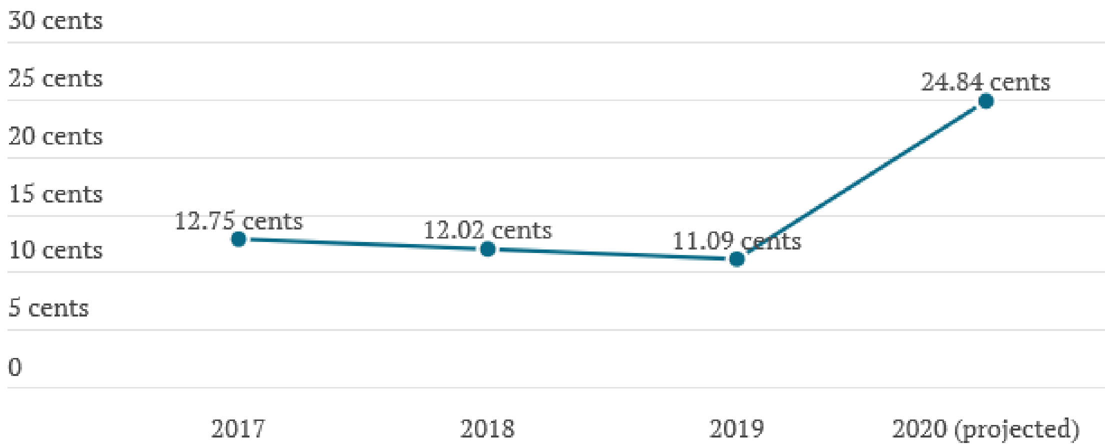
Q. Do you have evidence that the value of solar can vary widely from year-to-year?

A. Yes. First, it is important to emphasize that the changes in the value of CG exports from year-to-year will depend on the methodology and models chosen to make the valuation. One recent example of an unanticipated annual change occurred in the State of Minnesota

[51] ECRs have the potential to either increase or decrease from year-to-year.

due to the method that was adopted to calculate avoided distribution capacity costs.[52] For 2020, a dramatic price spike was projected as shown in Figure 8.[53]

Figure 8: Levelized "value of solar" rate in Minnesota, 2017-2020



The Minnesota Public Utilities Commission did not implement this rate but opened a proceeding to evaluate it which resulted in a change in the methodology, and subsequently, a change in the 2020 rate. Other state jurisdictions recognize the inherent rate volatility associated with updating the value of solar annually, and although they continue to calculate the value annually, they use a rolling average of annual valuations to set the yearly rate. For example, Austin Energy uses a five-year rolling average of the value of solar to set annual rates.[54]

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[52] Xcel Energy, *Petition: Value of Solar Methodology*, Minnesota Public Utilities Commission, Docket No. E999/M-14-65, at, p. 8, August 2, 2019, https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={2025546C-0000-C815-AE91-584D9698D918}&documentTitle=20198-154920-01.

[53] Figure taken from Jossi, Frank, *Xcel Energy seeks changes as 'value of solar' rate spike looms in Minnesota*, Sept. 9, 2019, available at https://energynews.us/2019/09/09/midwest/xcel-energy-seeks-changes-as-value-of-solar-rate-spike-looms-in-minnesota/.

[54] DSIRE, NC Clean Energy Technology Center, *Austin Energy – Value of Solar Residential Rate*, available at https://programs.dsireusa.org/system/program/detail/5669 (Last updated April 27, 2015).

Q. What do you conclude about Mr. MacNeil's proposal to update the ECR annually?

A. The Commission should reject RMP's proposal to update the ECR annually. Export rates are integral and significant part of a CG customer's overall rate. Changing CG customer rates annually is discriminatory since other customer rates are not updated annually and creates price instability for individual CG customers—both violations of good rate design. The modelling process proposed by RMP to determine the ECR is complicated, and if repeated annually, will increase regulatory burden. RMP's proposed method to calculate the annual updates is backward looking, not reflective of future infrastructure and policy goals, yet another violation of good rate design. Annual updates will unnecessarily harm CG customers by shifting risk to them and the CG solar community, increasing financing costs and reducing the attainability of CG solar for many customers.

VII. RMP's Proposal to Zero Out Remaining Export Credits Each Year

Q. What is RMP's proposal for the expiration of export credits?

A. Mr. Meredith proposes that export credits in excess of charges[55] on a customer's bill be allowed to roll over month-to-month until March of each year (October for irrigation customers) at which point they would expire.[56]

[55] Mr. Meredith also proposes that export credits not be allowed to offset customer service charges. I agree with this proposal.
[56] *Meredith Direct*, lines 155–62.

Q. On what basis does he support this proposal?

A. Mr. Meredith explains that CG customers are not supposed to be power producers (like qualifying facilities, for example); rather, the purpose of the export credits is to offset some, or all, of a CG customer's energy bill. Given that CG customers are not supposed to be power producers, Mr. Meredith's rationale for eliminating outstanding credits at the end of the year is to "encourage customers to appropriately size their generation systems to match actual usage at the site of the system."[57] Mr. Meredith provides no other rationale.

Q. Has Mr. Meredith provided any evidence that zeroing out credits at the end of the year has resulted in the sizing of CG generation systems that match actual customer usage?

A. No. Mr. Meredith has provided no evidence of the effect that credit expiration has on system production relative to customer usage. For example, a policy of credit expiration could be causing installations to be undersized, resulting in less savings for the customer, less business for the solar installers and manufacturers, and as the distribution markets develop, less grid services for the utility. Or, the policy may be having no effect at all on system sizing.

Q. In general, do customers considering an investment in rooftop solar, have the expertise to appropriately size their generation systems to match actual usage?

A. No. Sizing a rooftop solar system requires complex calculations. CG customers would have to rely on their solar provider to make this estimate. In addition to being complex, the estimation is necessarily imprecise. On the demand side, it requires estimated annual energy

[57] *Id*. at lines 157–58.

usage, which for the average family varies from year to year. On the supply side, it depends on the type of solar panel; the type, size, and capability of the inverter; the pitch and orientation of the roof; the space on the roof; the amount of sunlight and intensity of sunlight at the customer location; and roof shading issues. Penalizing CG customers by zeroing out their credits penalizes them for system size, something over which they have little control.

Q. Is a one-year time frame for the expiration of credits appropriate?

A. No. The productive life of a solar installation is 20-25 years. During this period a family experiences numerous events that naturally change consumption year-to-year: students go away to college; someone sets up business at home; new high efficiency appliances or air-conditioning are installed; or a relative comes to stay for an extended period. The sizing of a system to account for all these changes will result in production that exceeds consumption in some years and falls below it in others. A one-year period for the expiration of credits is arbitrary, punitive, and does not reflect usage over the life of the investment.

Q. Does eliminating remaining credits at the end of the year promote efficiency behavior?

A. No, it promotes wasteful inefficient behavior. To avoid losing credits that CG customers have legitimately earned for the energy they supplied to the grid, customers are incentivized to increase their use of energy to use those credits up. The incentive to use them up exists even if it the CG customer gets little benefit from their use. They may, for example, simply turn up the air-conditioning or leave all the lights on.

Q. Are there other drawbacks to eliminating credits at the end of the year?

A. Yes. Taking away customer credits creates bad will and customer dissatisfaction.[58] The practice is perceived as being unfair—and *it is* unfair. Many CG customers have made substantial investments in their CG assets. A policy that takes away the returns on those investments and gives them to other customers or utility shareholders is unfair. The policy is particularly egregious if the CG customer's system was sized to offset estimated annual load given all the information available at the time of installation, but changes in consumption or production patterns occurred after installation. Most startlingly, a policy of expiring customer credits flies in the face of the Commission's Demand-Side Management ("DSM") policy. It imposes a penalty on customers that take actions to reduce their energy consumption and might even disincentivize investments in energy efficiency.

Q. Is there a better way to ensure that CG systems are appropriately sized?

A. Yes. A set of upfront mandatory guidelines could be put in place at the installation phase to achieve appropriate sizing. Solar installers would be required to gather the required input data and run the numbers to determine the maximum size of the installation. The guidelines should allow for projected changes in load due to, for example, the anticipated purchase of an electric vehicle or an increase in the number of home occupants. As technology improves and CG customers are able to supply grid services, the sizing of installations should consider these grid services that provide system benefits. Guidelines, instead of a policy of credit

[58] For example, a customer filed a comment in this docket regarding eliminating credits on May 4, 2020. *See* Carter and Cindy Haacke, *Public Comment from May 4, 2020*, https://pscdocs.utah.gov/electric/17docs/1703561/313512PblcCmntsMay420205-4-2020.pdf.

expiration, have been adopted in California and other jurisdictions.[59] The Commission should adopt the same approach here.

VIII. RMP's Proposed $150 Application Fee

Q. What application fee does RMP propose to charge CG customers under its new proposed ECR schedule?

A. Mr. Meredith proposes a onetime non-refundable application fee of $150 for all CG customers regardless of the size of their installation.[60]

Q. What application fees does (or has) RMP charge customers under Rate Schedules 1, 2, 2E, 3, 6, 6A, 6B, 8, 23, 135, and 136?

A. RMP charges no application fee to customers under Schedules 2, 2E, 6, 6A, 6B, 8, 23, and 135.[61] Of note, grandfathered net metering customers under Schedule 135 were not charged an application fee. Schedule 1 and 3 customers are charged an application fee of $10. Schedule 136 Transition Program customers are charged an application fee based on the size of their CG system:

Level 1 - $60 per application

Level 2 - $75 per application plus $1.50 per kilowatt of installed capacity

[59] DSIRE, NC Clean Energy Technology Center, *Net Metering, Program Overview California*, available at https://programs.dsireusa.org/system/program/detail/276 (Last updated March 16, 2018). Other examples of states that do not zero out credits are Nebraska, Colorado, and Kentucky. For state-specific information, see DSIRE, NC Clean Energy Cent, *Programs*, available at https://programs.dsireusa.org/system/program/.

[60] *Meredith Direct*, line 204.

[61] Exhibit 3-CAB, *Response to Vote Solar Data Request 11.5(6)*, RMP's Responses to Vote Solar 11th Set Data Requests (April 17, 2020).

Level 3 - $150 per application plus $3.00 per kilowatt of installed capacity

Q. Please explain the meaning of Levels 1, 2, and 3 as used for Schedule 136 customers.

A. Level 1 applies to customers with a certified, inverter-based system with capacity of 25 kW or less. Level 2 applies to customers with capacity of 2 MW or less that does not qualify for or fails Level 1 requirements. Level 3 applies to customers with capacity greater than 2 MW and less than or equal to 20 MW or whose generation facility is not certified or does not qualify for or fails to meet Level 1 or Level 2 requirements.[62]

Q. Does PacifiCorp, RMP's parent company, charge different (or no) application fees to CG customers in the states that it operates outside of Utah?

A. Yes. PacifiCorp charges no application fees for Schedule 135 customers in Oregon, Wyoming, Washington, and Idaho. In California, there are currently two rates schedules under which CG customers take service: NB-136 and NEMVS-139. The application fee for Schedule NB-136 is $75, and there is no application fee for Schedule NEMVS-139 customers.[63] Mr. Meredith's application fee proposal of $150 for ECR customers is well in excess of the fees PacifiCorp charges to CG customers in all other states.

Q. Are you aware of other states that charge no application fee to CG customers?

A. Yes. The states of Florida, Kentucky, and Mississippi have no application fee for the smallest systems, typically 10kW or smaller.[64]

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[62] Utah Administrative Code, R76-312-2 (21), (22), (23), available at https://rules.utah.gov/publicat/code/r746/r746-312.htm.

[63] Exhibit 4-CAB, *Response to Vote Solar Data Request 14.2*, RMP's Responses to Vote Solar 14th Set Data Requests (June 24, 2020).

[64] Tian Tian, Chang Liu, Eric O'Shaughnessy, Shivani Mathur, Alison Holm, and John Miller, *Midmarket Solar Policies in the United States, A Guide for Midsized Solar Customers*, NREL, at pp.53, 75, 95, Sept., 2016,

Q. Were application fees addressed in the 2017 stipulation between RMP and intervenors regarding the Transition Period?

A. Yes. In the stipulation, the application fees for Schedule 136 customers were set out as shown above and were stated to apply to both Transition Customers and Post-Transition Customers.[65] However, the stipulation also allowed for changes by the Commission, which, in my opinion, should be cost-justified.

Q. Has Mr. Meredith established that the proposed application fee is cost justified and comparable to application fees charged to other customers?

A. No. Mr. Meredith has provided some estimated cost data associated with CG systems in PacifiCorp's six state service territory.[66] Total costs are (for this analysis) allocated to states based on a state's percentage of total CG applications in the July 2018 to June 2019 period.[67] Costs are divided into three buckets: (i) administrative; (ii) engineering review; and (iii) customer service. No cost support is provided for administrative costs, nor is any explanation provided as to how those costs are different from the administrative costs for all other customers. The engineering review costs provided in the analysis are average costs per application that do not account for the very different reviews necessary for Level 1, Level 2, and Level 3 applications. The stated review time is based on discretionary estimates.[68] The costs for customer service are related to two items: meter exchange work

https://www.nrel.gov/docs/fy16osti/66905.pdf.

[65] Rocky Mountain Power, *Settlement Stipulation*, Utah Public Service Commission, Docket No. 14-035-114, ¶ 17, Aug. 28, 2017, https://pscdocs.utah.gov/electric/14docs/14035114/296270RMPSettleStip8-28-2017.pdf.

[66] *Meredith Direct*, RMP Workpapers RMM-3 (file name: "Wrkprs RMM3 PrpsdCstmrGnrtrApplFee Calc2-3-2020.xls").

[67] *Id.*

[68] Exhibit 3-CAB, *Response to Vote Solar Data Request 11.5-7(2)*, RMP's Responses to Vote Solar 11th Set Data Requests (April

orders and customer phone calls. RMP states that PacifiCorp "does not specifically track word order, count, and average handle time, by state and type,"[69] and thus cannot confirm that the costs for CG meter exchange work orders are any different from the costs for non-CG meter exchange work orders. Regarding customer phone calls, the estimated costs are based on the number of calls "for any existing or proposed net metering program"[70] and thus are, at best, loosely related to the CG application process. Further, based on the types of calls received by PacifiCorp, some targeted to specific types of customers who are not charged separately for customer service,[71] there is no basis to single out CG customers for a specific charge. Mr. Meredith's proposed application fee of $150 for every CG customer is not cost justified.

Q. On what basis does Mr. Meredith justify an increase in the application fees for Level 1 and Level 2 CG customers from $60 to $150, and from $75 (plus $1.50 per KW installed capacity) to $150 respectively?

A. Mr. Meredith provides no justification, other than "to simplify its application process and make the cost of interconnecting more transparent for customers."[72]

17, 2020); *Meredith Direct*, RMP Workpapers RMM-3 (file name: "Wrkprs RMM3 PrpsdCstmrGnrtrApplFee Calc2-3-2020.xls").

[69] Exhibit 3-CAB, *Response to Vote Solar Data Request 11.5-7(3a)*, RMP's Responses to Vote Solar 11th Set Data Requests (April 17, 2020).

[70] *Id.*, *Response to Vote Solar Data Request 11.5-7(3f).*

[71] *Id.*, *Response to Vote Solar Data Request 11.5-7(3h)*.

[72] *Meredith Direct*, lines 230–32.

Q. Does this justification have any merit at all for Level 1 customers?

A. No. He is proposing to increase the fee from $60 to $150 with no simplification in the application process and no increase in transparency.

Q. Does this justification have any merit for Level 2 customers?

A. No. Mr. Meredith has proposed no changes in the application process. The only increase in transparency for Level 2 is that these customers will no longer need to multiply the kWh of installed capacity by the $1.50/kWh fee to calculate the total fee. A customer with a 15kW system would pay, for example, $75 (base fee) + ($1.50 x 15kW) = $97.50 under the Schedule 136, but $150 under Mr. Meredith's proposal. The increase in transparency does not merit the increase in application fee.

Q. How does Mr. Meredith's application fee proposal impact Level 3 customers?

A. Level 3 customers, with systems between 2 – 20 MW, will be charged a lower application fee under Mr. Meredith's proposal. Level 3 Schedule 136 customers pay an application fee of $150 plus $3.00 per kW of installed capacity. Mr. Meredith's proposal removes the $3.00 per kW fee.

Q. What additional rationale does Mr. Meredith provide to justify application fees for CG customers generally?

A. He explains that application fees will deter customers from filing "unnecessary applications"[73] because application fees will "prevent some of the customers who are not serious about installing a new customer generation system from applying."[74]

Q. Has Mr. Meredith provided any evidence that customers who are not serious about installing a new customer generation system are filing applications?

A. No.

Q. Why would a customer apply for approval to install a solar system and then back out?

A. Investing in a solar system is a significant investment for most customers, similar to that of purchasing a new car. It is not at all unusual for a customer to have a change in heart during the application process. Backing out of the process does not signal that the customer was "not serious" about installing a CG system.

Q. Is it appropriate for RMP to charge an application fee to deter applications?

A. No. RMP has provided no basis for such a policy. If RMP's proposal to charge Level 1 CG customers a $150 application fee is based on deterring applications, then that proposal should be rejected by the Commission.

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[73] *Id.* at line 220.

[74] *Id.* at lines 226–27.

Q. Are there ways for RMP to reduce CG application costs?

A. Yes. More and more utilities across the country are improving and streamlining interconnection processes with online applications and automated software. "The most advanced implementations combine and integrate these online portals with the utility's existing asset management and other data systems. This integration can help to further automate the review process and, in some cases, can even be used to assist with screening and initial engineering reviews of projects."[75] With the emergence of new software and processes, application costs and times for utilities are falling.

Q. Do you have examples of this for specific utilities?

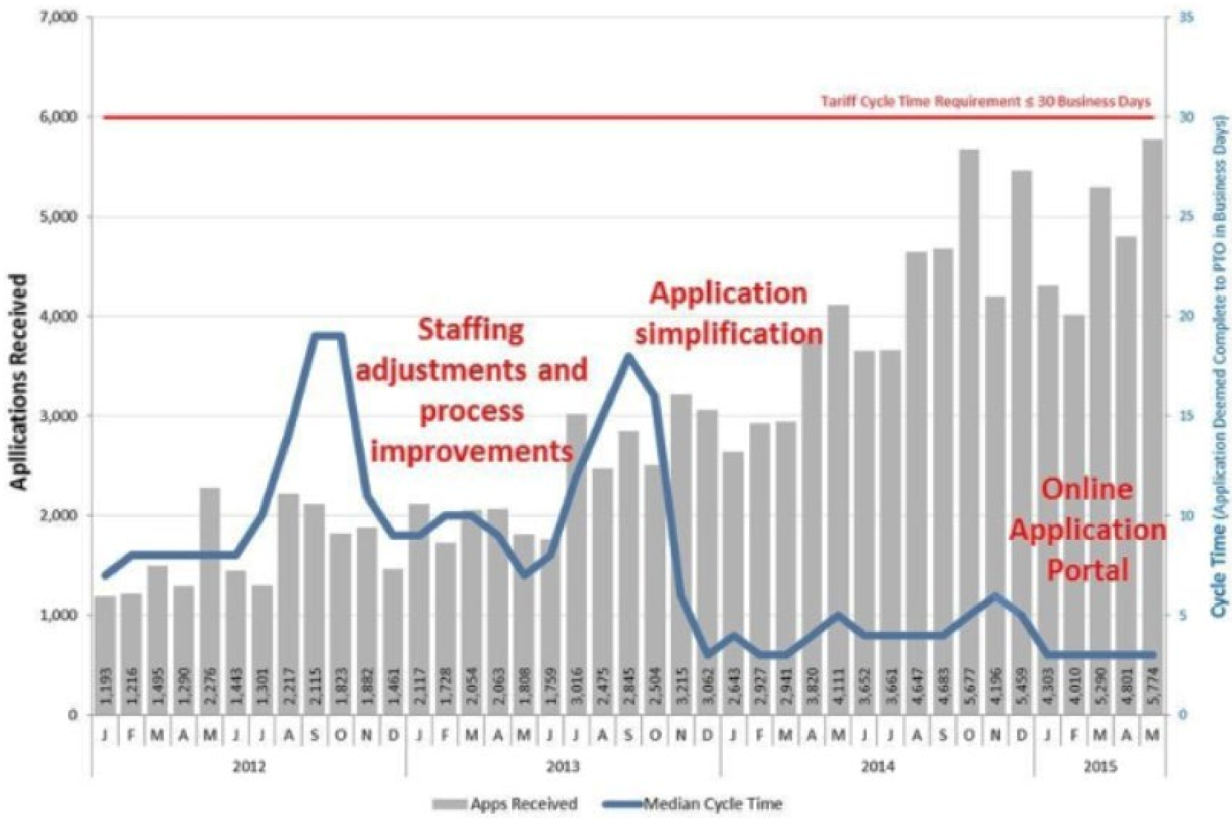
A. Yes. San Diego Gas & Electric realized more than $2 million in savings in the first year following deployment of a distribution interconnection information system.[76] Pacific Gas & Electric Company was able to reduce interconnection review time from 20 days at the beginning of 2012 to 3 days in mid-2015 despite the increase in applications from 1,500 a

[75] Zachary Peterson and Emerson Reiter, *Improving Interconnection Processes with Online Application Processing Systems*, NREL: DGIC Interconnection Insights, October 2017, https://www.nrel.gov/dgic/interconnection-insights-2017-10.html.

[76] Ken Parks, SDG&E and Bob Woerner, PG&E, Distributed Generation Interconnection Collaborative, *Innovation in the Interconnection Application Process*, NREL, at p. 11, April 2, 2014, https://www.nrel.gov/dgic/assets/pdfs/2014-04-02_innovation-in-the-interconnection-application-process.pdf.

month to over 5,750 a month. As shown in Figure 9, these reductions were achieved through application simplification and the adoption of an online application portal.[77]

Figure 9: PG&E Interconnection Process Improvement Results



Q. Has Mr. Meredith cost justified his proposed increase in application fees for Level 1 and 2 customers?

A. No. He has provided no evidence of increased costs since the stipulated amounts were agreed to and approved by the Commission.

Q. What application fee do you recommend?

A. Instead of increasing the application fees, I recommend that they be reduced. RMP has provided no cost justification for an increase in application fees and does not charge application fees in any other state except California, and even there, a fee is charged under just one of the CG rate schedules. I recommend that the Commission keep the same application fees for Level 2 and Level 3 customers as is currently charged to Schedule 136 customers and consider reducing the application fee for Level 1 customers to zero since the cost of processing these applications is relatively small. A reduction in total application fees will incentivize RMP to deploy new technologies that can reduce application time and costs. This would be the efficient outcome.

Q. Does this conclude your rebuttal testimony?

A. Yes.

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[77] ICF International, *Integrated Distribution Planning*, Prepared for the Minnesota Public Utilities Commission, p. 14, August 2016, https://www.energy.gov/sites/prod/files/2016/09/f33/DOE%20MPUC%20Integrated%20Distribution%20Planning%208312016.pdf; *see also*, Kristen Ardani and Robert Margolis, *Decreasing Soft Costs for Solar Photovoltaics by Improving the Interconnection Process: A Case Study of Pacific Gas and Electric,* NREL, at 8–9, September 2015, https://www.nrel.gov/docs/fy15osti/65066.pdf; Doherty, Paul, *PG&E Updates Data Portal to Reflect Increased Distributed Energy Resources Integration Capacity*, May, 11, 2020, http://www.pgecurrents.com/2020/05/11/pge-updates-data-portal-to-reflect-increased-distributed-energy-resources-integration-capacity/.

CERTIFICATE OF SERVICE

I hereby certify that on this 15th day of July, 2020 a true and correct copy of the foregoing was served by email upon the following:

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