November 11, 2016

**VIA HAND DELIVERY**

Utah Public Service Commission
Heber M. Wells Building
160 East 300 South, 4th Floor
Salt Lake City, Utah 84111

**Re: Utah Docket No. 14-035-114, In the Matter of the Investigation of the Costs and Benefits of PacifiCorp's Net Metering Program: *Questions in advance of the Nov. 5 technical conference on Rocky Mountain Power's residential load research study***

Dear Public Service Commission,

Pursuant to the Commission's Notices of Comment Period and Scheduling Conference issued November 21, 2014, Sierra Club, the Alliance for Solar Choice, Utah Clean Energy, and Utah Citizens Advocating Renewable Energy offer the following comments on the net metering load research study being developed and implemented by Rocky Mountain Power.

We understand this load research study to be the first and critical step toward more comprehensive analysis of the costs and benefits of net metering required by Senate Bill 208.[1] We have asked Pecan Street Inc., a non-profit specializing in load research, to evaluate Rocky Mountain Power's study. The recommendations of Bert Haskell, Pecan Street's CTO, are attached hereto as Exhibit A, and discussed throughout these comments.

Our comments cover a broader range of topics reflecting the need for the Commission to consider this load research study in the context of how it will be used in this docket and future ones. Inevitably, placing the load research study in context requires some discussion of the scope of the forthcoming cost-benefit study. We do not offer comments on the scope of

[1] Utah Code Ann. §54-15-105.1.

that study at this time, but look forward to doing so by February 6, 2015 as requested in the Commission's November 21st notice.

## I. Overview

The absence of the type of information that a load research study would produce was central to the Commission's decision rejecting RMP's proposed net metering facilities charge. In its August 29, 2014 order on RMP's General Rate Case, the Commission noted that RMP's assertion that "net metered customers comprise a subgroup of the residential customers that imposes different costs on the system" was "not supported by any empirical data" showing that the "level of usage or the load characteristics of net metered customers are materially different from the typical residential customer."[2] RMP acknowledged that time-based load research data for net metering customers was necessary for the "development of allocation factors and billing determinants for residential customers," and to measure "net metered customer's usage at the time of system coincident peaks . . . [which] is the driver for the allocation of transmission and generation costs."[3] The Commission expressed skepticism about RMP's assertion that residential net metered customers are distinguishable on a cost of service basis from the general body of residential customers in the absence of data on the usage characteristics such as "load profile, load factor, and contribution to relevant peak demand."[4]

High-quality data on these usage characteristics will be a prerequisite to any future proposed changes to the rate structure for net metering customers for two reasons. First, as the Commission has indicated, these data are necessary to identify the cost of service for a particular group of customers in order to justify disparate rate treatment. Second, these data are critical to the comparison of the costs and benefits of net metering required by the Utah Legislature.

The Commission opened Docket No. 14-035-114 to examine the costs and benefits of net metering pursuant to Utah Code Ann. §54-15-105.1. Although RMP began designing its load research study for residential net metering customers during the 2014 General Rate Case, the first step in this docket has been to understand how the load research study will unfold and how it will inform the cost-benefit analysis.

---

[2] PacifiCorp dba Rocky Mountain Power 2014 General Rate Case, Docket No. 13-035-184, Aug. 29, 2012 Order, at 62 (hereinafter "Order").
[3] *Id.* at 63.
[4] *Id.* at 68.

Rocky Mountain Power presented information regarding its load research study at its November 5, 2014 technical conference. We appreciate the time that RMP took to have key staff present the design and status of the study and answer questions, and for providing written materials afterward for review. We also appreciate Rocky Mountain Power's efforts to answer questions that we raised in a letter sent to the Company in advance of the technical conference.

We have several concerns about the design of the study, which we discuss in more detail below. These concerns arise from our desire that the data collected are of the highest quality, are free from gaps and bias, and will be useful in a variety of applications in the future. In sum, we recommend the following:

1. The load research study must be expanded to include commercial net metering customers on rate schedules 23, 6 and 8.
2. The sample design and sample size must reflect the size and orientation of net metered systems, as well as customers' net and gross consumption.
3. The Company must collect and disclose data for each participant in the study on system characteristics, geography, location on the distribution system, and key load characteristics derived from a home audit (such as whether the customer has air conditioning installed or more efficient cooling systems).
4. Similar data should be included for customers without solar.

## II. Description of the Current Load Research Study Design

Rocky Mountain Power plans to install 15-minute interval meters on 62 net metered residences, to capture both solar production and total customer usage. The Company's sample design is based on four strata of monthly net billed consumption: 0-400 kWh, 401-900 kWh, 901-2000 kWh, and greater than 2,000 kWh. At least 80% of the residential net metering customers sampled fall into the first two blocks.[5] The sample is drawn from the 1,578 residential NEM customers who have been interconnected for more than nine months, which is only 82% of the 1,923 residential net metering customers RMP reported as of December 31, 2013.[6] The initial selection group was identified by selecting customers at regular intervals of

[5] Note that the average monthly net billed consumption for residential net metering customers, as reported by RMP in the rate case, is 518 kWh. Order at 62.

[6] As the Company noted during the July 2014 rate case hearing, the number of net metering customers is growing rapidly. Therefore, the sample is likely drawn from what represents an even smaller percentage of the overall residential NEM customer group.

billed consumption throughout the entire range. Four alternatives were preselected for each of the 62 initially identified participants.

The study will not include new interval meters on non-NEM residential customers—RMP indicates that it has sufficient interval meters already in place on residential customers to allow for comparison. However, an RMP representative also indicated that the ongoing load research study on general residential customers does not necessarily exclude net metering customers, representing in excess of 50% of net metered MW on the RMP system. The study also does not include commercial net metering customers. We discuss the implications of this omission below.

## III. Recommendations for Load Research Study

**A. Expand the Study to include Commercial Customers.** We note that the exclusion of commercial net metered customers from this study will prevent proper analysis of the overall net costs (i.e. revenue reductions) of net metering, and of the benefit categories. Looking at residential data alone will not give the full story about the contribution of NEM customer generation to the coincident peak which is a key factor in the overall system cost, and to offsetting the peak demands on distribution circuits with proportionally higher commercial loads. RMP indicated at the technical conference that because commercial customers already have demand meters installed, existing data are sufficient to develop the load characteristic data needed. While RMP already has data for commercial customers, the method used to collect that data should match the method ultimately used to collect data for residential NEM customers. It is critical that the same type and granularity of data is gathered for non-residential NEM customers (those on Schedules 23, 6, and 8), specifically that generation and load data are available on at least a 15-minute basis. We request that the Company provide additional explanation of how the data it collects from commercial NEM customers will be used in the forthcoming cost-benefit analysis.

**B. Collect Data Necessary to Accomplish Cost-Benefit Analysis.** Load research data (i.e. customer load with and without solar generation) in at least 15 minute granularity is necessary to understand how net metering customers impact the utility grid. As Pecan Street notes, one-minute load data would provide even better information, as the 15-minute interval can obscure generation and load at the exact time of relevant system peak.[7]

[7] *See* Exhibit A, at 3.

Understanding the impacts of net metering also means knowing how and in what ways NEM customers use the grid differently than non-NEM customers and whether these differences are significant. If the load research study shows that NEM customers use the grid differently than non-NEM customers in significant ways, it will be important to identify whether that different use is due to the presence of the customer-sited PV system or other characteristics of that customer. Therefore, it is important for RMP to collect from study participants, and make available to stakeholders, information on home or business energy use, and use by a particular customer before the solar system was installed. To the extent that net metering customers appear to differ from non-net metering customers in their impact on the grid, we believe that the Company must understand whether some of this difference relates to energy use by net metering customers independent of their self-generation.

***Control group.*** To make a valid comparison to non-NEM customers, the Company will need to compare the residential NEM sample to a valid residential control group, along with a similar comparison for non-residential NEM customers. [8] RMP indicated at the November 5 technical conference that it intends to compare the data from the net metering load research study to data from ongoing residential load research studies. However, that control group does not intentionally exclude NEM customers, which could affect its validity as a control group. RMP should evaluate whether any of its existing residential load research study meters are on net-metered homes and ensure that after excluding those, it has a valid control sample. An adequate control group is necessary so that the Company can evaluate the variability within non-NEM customers' usage and understand whether the inter-group differences are significant in light of intra-group variability.

***Gross consumption.*** Moreover, to provide a useful comparison with a control group, NEM customers and non-NEM customers must be studied in exactly the same way – i.e., if they will be stratified, they must be stratified using the same method/variable. Importantly, even if both groups are stratified using net billed consumption, this has the potential to distort the analysis, because net billed consumption for net metered customers is less than their gross consumption. Therefore, it will not truly be an apples-to-apples comparison of residential customers with similar electricity consumption levels.

As noted above, the current sample design for the net metering load research study is stratified based only on net billed consumption. This is problematic since two net metering customers with vastly different levels of gross consumption and PV system size could be

[8] *See* Exhibit A, at 3-4.

similar in terms of net billed consumption, masking potentially significant differences in their contribution to coincident system peak and other factors relevant to cost benefit analysis. Rocky Mountain Power has not explained or justified its decision to stratify the sample of NEM residential customers upon net billed consumption. We recommend stratifying samples based on gross consumption in order to compare customers with consumption levels unmasked by on-site generation (though both net and gross consumption will be important in an analysis of peak impacts). An estimate of gross consumption could be based on modeling of the expected output of each NEM system based on system size and orientation.

***System orientation and size.*** Additionally, the sample design does not discuss the orientation of PV systems, which has a notable impact on the time of peak generation.[9] We believe that RMP should factor PV system size and orientation into its sampling design, and adjust the sample size accordingly.[10]

For example, a question of particular attention in the rate case was whether NEM customers reduce demand at the time of peak on the transmission line or distribution feeder. It does not appear that RMP is considering how the data it is collecting through the load research study will answer that question. At a minimum, RMP must factor system orientation into its sample design, so that the time of peak PV generation across the system can be better estimated. The Company should also ensure that the generation and load data it is collecting will align with the data gathered on distribution feeder loads, with correlating information regarding the relative penetrations of residential and non-residential customers on each feeder. The Company should also consider equipping a sampling of transformers with high-quality power monitoring equipment to better understand the existing operation and how it is affected by customer-sited generation.[11]

Furthermore, the contribution of distributed generation to reducing system coincident demand during peak hours of the year is also relevant for the Commission's investigation. If

[9] *See id.* at 2.
[10] RMP has data on these variables in its possession through the interconnection agreements that all NEM customers must complete. At the technical conference, RMP expressed its belief that the data in its possession are not accurate or up-to-date. If this is true, it could raise serious questions as to RMP's ability to ensure the security of the distribution system, since each new interconnection should be reviewed in light of existing customer-sited generation systems on the same feeder. RMP should conduct on-site inspections of a sampling of interconnected PV systems to validate its existing data, both for the purposes of reliability and to improve its sample design for the load research study. We also note that RMP should have high-quality data for those systems that received solar incentive funding, since that funding is based on installed system size.
[11] See Exhibit A, at 4.

the load research sample is not representative in terms of system orientation, the Company will not be able to evaluate whether the contribution to coincident peak is representative of all net metering customers. If such information is not available, the only recourse is to assume optimum orientation. The Company must also collect verified data on system size and orientation for all study participants in order to enable robust use of the generation data.

***Sample size.*** To the extent that the sample design looks at additional factors, such as orientation and system size, and efficiency factors such as cooling technologies, the sample size will need to be adjusted to ensure statistical validity.

**C. Load Research Study Must Provide Data to Evaluate Load Profile, Load Factor and Contribution to Peak.** As this Commission has recognized, fundamental principles of rate design require careful empirical analysis prior to making changes to existing tariff structure, such as imposing fees on or paying credits to net metering customers, or treating net metering customers as a separate class. In its recent rate case order, the Commission made clear that no change to the NEM tariff would be appropriate absent evidence that the cost of service for residential net metering customers is different from non-NEM residential customers. Specifically, the Commission called for data on "load profile, load factor, and contribution to relevant peak demand."[12]

Thus, the current net metering load research study must provide valid, comprehensive, and representative data on these factors. To assess any claim that the cost to serve NEM customers is distinct, data on solar contribution to relevant peak demand must be generalizable from the study sample. The size of the installed system relative to overall consumption and the orientation of the system are critical factors in contribution to an individual customer's peak. Further for both solar and non-solar customers, it is critical to analyze factors, behaviors or equipment that contribute to peak demand regardless of whether a customer has distributed generation. Therefore, the Company must ensure that its sample is representative with respect to these variables.

Moreover, the data must be robust enough to ensure that any difference in the cost to serve NEM and non-NEM customers is based on the presence of customer-sited generation and not other factors. As the Commission heard in extensive public comments on the rate case, many net metering customers are also highly energy efficient. Customers who are concerned about reducing their energy bills or their environmental impact often choose to first reduce their consumption through conservation and efficiency measures, and later invest in a PV

[12] Order at 68.

system. Moreover, customers that install a PV system often become more energy aware once they have access to more granular data about their consumption, and become more efficient in their consumption of electricity as a result. For this reason, it is essential that comparisons across these groups focus on the total consumption of a net metering customer (rather than their net billed consumption), as described above. We believe that in order to ensure the data from the net metering load research study are usable, the Company must ensure that its study participants are representative in terms of energy efficiency and conservation measures. This could be done through a survey of participating customers to approximate the load factor by looking at appliances, HVAC, and other major energy consuming technologies in the home.[13]

Separate and apart from the load research study, a determination of the cost of service for net metering customers must include an identification of any and all upgrades to distribution circuits necessitated by NEM solar and the net costs.

## IV. Participation in the Net Metering Load Research Study

We understand that Rocky Mountain Power has had some difficulty obtaining consent from residential NEM customers to install the interval meters. In September, a third letter was sent to those in the initial selection group who had not yet consented, offering a $100 incentive. In October, potential alternates were contacted. As of November 5, the Company had received only 39 approvals or consents and had installed only 12 interval meters.

In its November 21 order, the Commission sought recommendations for regulatory actions that could be undertaken to encourage residential NEM customers to participate in the LRS. While we do not have a proposal for regulatory actions to encourage residential participation in the LRS, a well-designed study that is supported by the solar industry and clean energy advocates will likely encourage greater participation.

## V. Conclusion and Summary of Recommendations

Sierra Club, the Alliance for Solar Choice, Utah Clean Energy, and Utah Citizens Advocating Renewable Energy appreciate the opportunity to submit comments on Rocky Mountain Power's load research study conducted as part of Docket No. 14-035-114. We asked Pecan Street Inc., a non-profit specializing in load research, to evaluate Rocky Mountain Power's study and make recommendations. These recommendations are attached hereto as

[13] See Exhibit A, at 5.

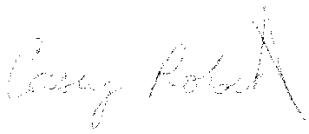
Exhibit A. In these comments we highlighted the importance of the following recommendations:

1. The load research study must be expanded to include commercial net metering customers on rate schedules 23, 6 and 8.
2. The sample design and sample size must reflect the size and orientation of net metered systems, as well as customers' net and gross consumption.
3. The Company must collect and disclose data for each participant in the study on system characteristics, geography, location on the distribution system, and key load characteristics derived from a home audit (such as whether the customer has air conditioning installed or more efficient cooling systems).
4. Similar data should be included for customers without solar.

Respectfully submitted on behalf of Sierra Club, the Alliance for Solar Choice, Utah Clean Energy, and Utah Citizens Advocating Renewable Energy,

_____

Sophie Hayes
Utah Clean Energy



_____

Casey Roberts
Sierra Club