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BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

In the Matter of the Application of Rocky Mountain Power for Authority to Increase its Retail Electric Utility Service Rates in Utah and for Approval of its Proposed Electric Service Schedules and Electric Service Regulations	**DOCKET NO. 13-035-184** **Utah Citizens Advocating Renewable Energy (UCARE)** **Exhibit 1.0 (DT)**

DIRECT TESTIMONY OF MICHAEL D. ROSSETTI

ON BEHALF OF

UTAH CITIZENS ADVOCATING RENEWABLE ENERGY

May 21, 2014

RESPECTFULLY SUBMITTED,
Utah Citizens Advocating Renewable Energy

Michael D. Rossetti

I. INTRODUCTION

Q: Please state your name, address and relationship to Rocky Mountain Power ("RMP").

A: My name is Michael D. Rossetti. My address is 13051 Shadowlands Lane, Draper, Utah 84020. I am a residential Net Energy Metering (NEM) customer and founder of Utah Citizens Advocating Renewable Energy (UCARE).

Q: For which party will you be offering testimony in this case?

A: I will be offering testimony on behalf of UCARE.

Q: Please explain your qualifications for testifying in this matter?

A: I am a senior computer scientist with 39 years of experience in software development and management from the programmer level up to the director level at major corporations such as Apple (7 years), Google (6 years), Intuit (6 years), Informix and others. I also have a hardware background. Further, I researched and studied solar PV systems for over a year before installing my own grid-tied residential solar PV system with a 5,020 maximum watt capacity.

While I have no direct experience in utility-level power system design, I do have extensive systems analysis skills that allow me to understand that the minimal analysis performed by RMP in support of their proposed net-metering monthly fee is incomplete and inadequately justifies such a proposal.

II. OVERVIEW AND CONCLUSIONS

Q: What is the purpose of your testimony?

A: The purpose of my testimony is to demonstrate that the Utah Public Service Commission (Commission) is the proper organization for assessing the

impact of various technologies on the residential utility customer and representing the interests of the citizens of Utah, not Rocky Mountain Power. My direct testimony is limited to demonstrating that RMP's proposal for a monthly net metering charge against residential NEM customers does not serve the interests of the body of Utah citizens as a whole.

Q: Please summarize your conclusions and recommendations.

A: UCARE concludes that RMP's analysis of the systemic and societal impact of residential NEM is flawed and incomplete and, if accepted by the Commission as justification for RMP's requested solar surcharge, will unduly and unfairly disadvantage residential NEM customers and, furthermore, unnecessarily and with prejudice impede expanded residential adoption of renewable energy generation with concomitant increases in air borne pollution and other environment degradations harmful to the public.

In order to accurately determine the impacts of residential renewable energy technologies, such as residential solar PV electricity production with NEM, both costs and benefits must be objectively assessed. This assessment cannot be limited exclusively to fixed costs as RMP has done in their analysis. Utah Senate Bill 208[1] explicitly mandates that the Commission "determine … whether costs exceed the benefits, or … the benefits exceed the costs." By minimizing or ignoring residential NEM benefits, and by using a very limited set of facts with elementary calculations, RMP has demonstrated an apparent bias

[1] http://le.utah.gov/~2014/bills/static/sb0208.html

against distributed generation choices by residential customers. UCARE hopes that the Commission will consider the probability that RMP's corporate commitments to securing profits through its fossil fuel-heavy energy generation model has reinforced an integrated resource perspective hostile to significant development of non-carbon energy facilities.

UCARE recommends that the Commission take into consideration not only the very minimal fixed cost shifting but also the offsetting benefits such as 1) deferral, reduction and/or elimination of future costs related to infrastructure upgrades and expansions that are passed on to residential customers, 2) reduction of CO_2, SO_2, NO_X, mercury and other gaseous emissions, 3) reduction of solid wastes such as ash, 4) reduction of cooling water consumption, and 5) reduction of the release of heated water into our rivers and streams. With all factors being taken into consideration, UCARE believes the Commission will see that, from a broad public perspective that includes all customers –NEM and non-NEM alike, the benefits of net-metering far outweigh the minor shifted cost.

UCARE further recommends that the Commission assert its regulatory authority over Rocky Mountain Power by requiring RMP to acknowledge and eliminate barriers it presents to the expansion of renewable energy production generally, and residential NEM in particular, in the State of Utah.

III. JUSTIFICATION OF CLAIMS

Q: Please explain why UCARE claims that RMP's analysis of residential NEM is flawed and incomplete.

A: The testimonies of Mr. Walje and Ms. Steward in support of a monthly

fixed fee to be paid by residential NEM customers is unsupported by any substantive evidence or exhibits other than a simplistic 16 line, two column spreadsheet[2]. Of those 16 lines, only 4 relate directly to net metering and then only discuss "fixed cost recovery". Meanwhile, their testimony claims without substantiation that there is "increased impact" by distributed generation, that "the Company is required to modify the distribution network", and that there is "increased wear on the equipment."There is not a single fact presented to back up any of these claims. In the absence of substantiating data analysis, RMP's argument for a net metering charge is not valid.

There is a considerable financial benefit to RMP realized when RMP charges the neighbor of a residential NEM customer for excess kWhs at the higher tier rate for electricity RMP does not produce while crediting the NEM customer with kWhs that are, on average, much cheaper for RMP to produce. RMP's justification for the proposed net metering charge is incomplete and unfounded without accounting for this financial benefit to RMP.

Excess NEM credits lost by residential NEM customers at the end of March each year are also not considered though they represent a financial benefit accumulated by RMP. According to Utah SB208, this acknowledged excess could be granted to RMP's low-income assistance program[3]–a benefit that should be considered when calculating the benefits of the net-metering program. Currently,

[2] See "249710Exhibit RRR - Exhibit to Steward Testimony - Calculation of Net Metering 1-3-2014.xlsx".
[3] http://le.utah.gov/~2014/bills/static/sb0208.html §54-15-104(4)

however, RMP redistributes this excess to "serve the load of other customers in the local area."[4] RMP's justification for a net metering charge is incomplete without identifying that financial benefit to itself of the redistribution of those sacrificed excess kWhs, for which they have incurred no cost.

Ms. Steward claims that, "We believe that this is **a good first step** in addressing this issue. While additional fixed costs related to generation and transmission are also being incurred by net metering customers and shifted to other customers, we are not proposing a charge that recovers those costs or raising other potential net metering policy implications at this time." [emphasis mine] Ms. Steward does not identify these other "additional fixed costs" that are shifted to other customers, implying that RMP is going to "go easy" on residential NEM customers. RMP's justification for a net metering charge is incomplete and unfounded without properly quantifying those additional costs.

Q: Are there any other financial considerations that should be taken into account when determining cost shifting by residential NEM Customers?

A: Yes. A surface reading of Ms. Steward's testimony and accompanying spreadsheet would imply that residential NEM usage is the greatest factor in "cost shifting". Consider, however, that according to RMP they (RMP) will fully recover the cost of service once a residential customer has consumed 695 kWh on a monthly basis.[5] The average residential customer consumed an average of 797 kWh per month for the period ending June 30, 2013. A simple calculation shows

[4] See RMP's response to UCARE Data Request 1.4.1.
[5] See RMP's response to UCARE Data Request 1.4.2.

that this average customer exceeded the 695 kWh required to fully recover the fixed costs by 102 kWh. Should the Commission approve the proposed $8.00 per month customer charge, RMP will realize a profit of 2.4¢ for each excess kWh. If consumption patterns continue to follow historical usage, RMP will realize a total average monthly profit of $19.17 per residential customer for the excess fixed costs collected. (If there are 725,000 customers then the profit to RMP comes to approximately $13,900,000 per month.) The purported 3.5¢ of cost shifting by residential NEM customers pales in comparison.

Q: Please explain why UCARE claims that residential adoption of renewable energy will be impeded by a monthly fixed charge against residential NEM customers.

A: Over the average 25-year lifetime of a solar PV system, a $4.25 per month fee would come to $1,275. For a small 3 kW system this can represent a nearly 10% increase over the basic installation costs. (Keep in mind that RMP says this is just to start.)

Those residential customers of modest means will be discouraged from investing in solar PV systems as it will be difficult to financially justify such an investment in the face of the proposed and potential future net-metering monthly charges. The reduced or eliminated return on investment renders the solar NEM option unaffordable.

Recent news from Arizona suggests that their recently imposed monthly solar NEM surcharge has already significantly depressed sales of residential solar systems, with economic consequences that threaten solar jobs in that state.

Every year, Rocky Mountain Power denies potential residential NEM customers access to rate payer-financed assistance through its Solar Incentive Program lottery. If the requested solar surcharge is approved, those customers who lost the lottery will face a further impediment to investing in solar PV equipment and making their contribution to the grid. UCARE believes that RMP should not have this level of control over the expansion of renewable energy in Utah.

Q: Please explain why UCARE claims that a fixed monthly net metering charge has a disproportional impact on residential NEM customers.

A: The proposed net-metering fee is a flat monthly charge. This implies that *all* residential NEM customers have the same electricity consumption and production patterns. In fact, there is a broad spectrum of residential NEM customers: some living in Park City and some living in Rose Park and some living all over the State of Utah; some having just a couple of panels producing a few hundreds of watts and some with dozens of panels producing several thousands of watts. It makes no sense to charge each of these the same flat fee (even ignoring, as does RMP's proposal, any benefits these systems provide to the greater Utah society).

High usage customers with small rooftop systems are unlikely to be feeding much excess 'net' electricity back to the system and using electricity at the higher tier rates. If they are charged a 'fixed' fee then they will probably be paying more than their 'fair' share–exactly what RMP is claiming they desire to avoid. Customers with larger rooftop systems are more likely to be offsetting their

consumption and remaining in the lower tier.

Likewise, the small system user will be having a smaller impact on emissions and waste while the large system user will be contributing the most to reducing emissions and waste.

It may be interesting to note that in Summit County (wherein lies Park City) there were 164 residential NEM customers as of March 5, 2014. By the same date, there were 1,259 residential NEM customers in Salt Lake County (wherein lies Rose Park).

UCARE's conclusion is that even proposing a flat monthly fee is simplistic at best and discriminatory at worst.

Q: Please generally describe the emissions, wastes and water impacts UCARE claims are beneficially affected by residential NEM customers.

A: According to Joelle R Steward's testimony, residential NEM customers produced 13,012,995 kWh of excess electricity for the reporting period. The table below shows the reduction in emissions by residential NEM customers for just their excess, according to the Natural Resources Defense Council (NRDC) calculations of PacifiCorp's emissions[6]:

Emissions	short tons/MWh	pounds/MWh	pounds/kWh	Total Pounds
CO_2	1.14693778	2293.876	2.293876	29,850,191
SO_2	0.00164701	3.294	0.003294	42,865
NO_x	0.00167132	3.343	0.003343	43,498

These emission reductions do not take into account the electricity

[6] http://www.nrdc.org/air/pollution/benchmarking/files/benchmarking-2013.pdf

produced and immediately consumed by the residential NEM customer, only the excess. Based on a limited survey of UCARE members, the average UCARE NEM member's system produces about twice as much electricity as it 'nets'. That means that the total emissions reduction by these UCARE members is approximately double that shown in the table above.

Depending on the information source chosen, fossil fuel powered electricity generation consumes from 0.57 to 1.10 gallons of water per kWh produced for closed-loop cooling.[7] That means that residential NEM customers are saving approximately 7 to 28 million gallons of water per year.

Q: Please explain why UCARE claims that infrastructure costs can be deferred, reduced or eliminated and why this is a benefit.

A: In general, it is maximum peak demand that determines the investment that an electric utility must make in new plants, grid improvements, and transformer and switch capacity improvements. Since solar PV production reduces peak demand there is a concomitant reduction in the maximums the grid, transformers and switches are required to carry. Even if the impact is only a few percentage points it still has the effect of postponing that investment by that few percentage points. This, then, becomes a cost that is delayed and, thus, not passed on to the RMP customer as soon as it would have been without the residential NEM customer's investment in solar PV.

[This witness does not claim to be qualified to properly calculate the

[7] http://www.nrel.gov/docs/fy04osti/33905.pdf,

reduction in costs that would otherwise be passed on to the RMP customer if such investments were deferred, reduced or eliminated. UCARE is merely pointing out that RMP's brief, 16 line spreadsheet has failed to identify yet another substantial benefit to the average Utahn.[8]]

Q: Please explain why UCARE claims that the shifted cost is minor.

A: According to Joelle R Steward's testimony in "Exhibit RRR – Calculation of Net Metering Facilities Charge" the residential NEM customers shifted $313,069 "Total Dist./Retail Fixed" costs to all residential customers. According to Ms. Steward, there were 8,887,629 total bills during the period. This results in an impact of 3.5¢ per bill.

In the same exhibit, Ms. Steward points out that there remains $149,253,612 in "Total Dist./Retail Fixed Cost not recovered in Customer Charge[s]" of which the $313,069 in "Net Metering Dist/Retail Costs" represents a trivial 0.20976%. UCARE considers this "straining at gnats".

IV. ADDITIONAL CLAIMS

Q: Is it (the net-metering monthly charge) 'fair'?

A: No. Paul Murphy, a Rocky Mountain Power spokesperson, said, "We're just looking for a way to make sure prices are fair for all of our customers and it's not a penalty it's for fairness we don't believe someone in Rose Park should be paying for someone who has solar panels in Park City."[9] Asking each RMP

[8] See again "249710Exhibit RRR - Exhibit to Steward Testimony - Calculation of Net Metering 1-3-2014.xlsx".

[9] http://fox13now.com/2014/04/15/power-company-proposes-new-charge-on-homes-with-solar-panels/

customer to spend an extra 3.5¢ per month to eliminate more than 30 million pounds of CO_2 per year is 'fair'. And for no extra charge residential NEM customers eliminate more than 43 thousand pounds of SO_2, and 44 thousand pounds of NO_x.[10]

Q: Are there any benefits to RMP beyond those passed on to the residential customer?

A: Yes. Ms. Steward states in her testimony, "In effect, under net metering the customer receives a bill credit for the excess electricity that reflects the full retail rate for energy." This is a distracting comment and is only true because RMP does not have time-of-day-based billing reflective of its time-of-day-based costs. When one analyzes RMP's costs based on time-of-day and NEM consumption patterns, one quickly sees that the residential NEM customer offsets RMP's most expensive electricity while redeeming that "full retail rate" credit later in the day when RMP's cost of production is significantly lower.

At peak electricity consumption times, RMP must purchase electricity at very high rates from third party providers or by running less efficient generation plants with greater emissions. During normal consumption periods, when NEM customers are redeeming their credits, the most efficient plants are sufficient.

Also consider that during peak solar PV production times, a 'net' kWh produced by a residential NEM customer is delivered directly to the closest residential neighbor. This kWh costs RMP nothing to deliver to the neighbor yet

[10] http://www.nrdc.org/air/pollution/benchmarking/report-2012.asp

RMP is charging that neighbor full price, likely at a higher tier. This kWh offsets the most expensive to produce electricity. Later in the day, when the NEM customer redeems that credited kWh, they do so with cheaper to produce electricity. RMP is benefiting by the difference in cost of that neighbor's kWh and the NEM kWh.

Q: RMP claims that there is an impact on the utility infrastructure due to solar PV usage by residential NEM customers. Do you agree with this assessment?

A: No. Here are the words from Ms. Steward's testimony:

Q. Some might argue that the reduction in billed kWh for net metering customers is similar to reduced usage from energy efficiency. Do you agree?

A. No. Unlike a traditional energy efficiency measure where the load and impact on the grid will predictably be reduced by the implementation of the efficiency measure, customers that install distributed generation have the same, or in many cases an increased impact, on the local distribution facilities. Frequently the Company is required to modify the distribution network in order to effectively minimize negative impacts on the grid and accommodate the new flow of electrons from the customer to the grid. Even in cases where upgrades are not required, the flow of energy back through transformers and onto the grid causes increased wear on the equipment.

First, solar energy production is no more difficult to predict and profile than residential air conditioning usage. UCARE is confident that RMP's analysts

can accurately project residential solar production. Partial cloud coverage *can* cause minor 'flickering' in the solar production but for a typical residential system this will have no more impact than turning on or off an electric oven or air conditioner. Grid demand fluctuates constantly due to many factors: a storm moves through, the temperature drop or climbs dramatically, stadium lights kick on. RMP's monitoring systems automatically sense these changes and adjust load distribution accordingly. To claim otherwise is disingenuous.

Second, it would be extremely rare for any 'net' energy to make it farther into the infrastructure than the closest junction with a neighbor. It is inconceivable that a typical residential solar PV system would feed *any* excess electricity further than the closest subdivision transformer. If such a case exists then RMP is advised to deal with such on a one-to-one basis rather than implying that *all* solar PV residential customers are dramatically impacting their system.

Third, during peak consumption times, solar PV production is actually *reducing* feeder and transformer loads by not only reducing the NEM customer's demand but also by reducing the neighbor's demand. The hottest days are cloudless, especially in Southern Utah, and so interruption of solar should be minimal.

Finally, there are no exhibits or testimony to substantiate RMP's claim that 1) any modifications have been required to RMP's infrastructure due to residential NEM installations, or 2) increased wear on RMP's equipment has been experienced.

Q: Are there any substantial differences between net metering and energy conservation techniques?

A: Yes. The amount of electricity consumption reduction possible through conservation techniques is limited to much less than 100% of the single residence potential consumption. Indeed, UCARE estimates that actual reductions through conservation techniques are likely to be less than 20% on average. A residence with a solar PV system and net-metering, however, can achieve far greater percentages of reduction, even surpassing 100%. A survey of UCARE members shows a sample of the reductions possible:

	Total Production	(24) Net Production	(14) Gross Consumption	Annual Excess	Ratio: Net to Gross
member a	29.850	13.632	47.014		29.00%
member b	3.240	0.987	7.171		13.76%
member c	17.000	5.352	37.010		14.46%
member d	46.784	32.454	27.072	5.382	119.88%
member e	4.081	2.466	3.148		78.34%
member f	3.073	2.719	2.715	0.004	100.15%
member g	4.400	3.360	2.780	0.580	120.86%
Totals	108.428	60.970	126.910	5.966	48.04%

(All amounts showing MWhs.)

This small sample clearly shows the enormous potential benefits possible from a private citizen's choice to invest in solar PV. This choice provides one way for residential NEM customers to project "green" power into the grid, all with their own personal investments.

It is also important to recognize that the typical renewable energy investor is also a strong energy conservation advocate. Before spending a penny of

personal money on a solar PV system, we first adopt and incorporate as many energy-conserving techniques as reasonably possible. Combining conservation with renewability multiplies the benefits of each.

Q: Do you have any final comments?

A: Yes. In Mr. Rossetti's case, he and his wife chose to invest Mr. Rossetti's small inheritance from his mother in clean energy instead of a home theater or a cruise. Other members of UCARE have made similar choices to forgoe material acquisitions and personal activities. RMP's traditional, carbon-based energy generation model would, of course, meet the majority of future energy needs with fossil fuel combustion; however, giving like-minded individuals the opportunity to freely make personal renewable energy investment choices, assure that a greater proportion of demand will be satisfied with cleaner, renewable energy.

Having a net-metering choice, without powerful corporate interests blocking those choices, is critical to the future of our state's environmental health.

Q. Does this conclude your direct testimony?

A: Yes.