Before the
Public Service Commission of Utah

In The Matter of the Investigation of the Costs and Benefits of PacifiCorp's Net Metering Program	Docket No. 14-035-114

Sur-Rebuttal Testimony of
Tim Woolf

On The Topic of
The Benefit-Cost Framework for Net Energy Metering

On Behalf of
Utah Clean Energy, the Alliance for Solar Choice, and Sierra Club

September 29, 2015

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1. INTRODUCTION AND QUALIFICATIONS

Q. Please state your name, title, and employer.

A. My name is Tim Woolf. I am a Vice President at Synapse Energy Economics, located at 485 Massachusetts Avenue, Cambridge, MA 02139.

Q. On whose behalf are you testifying in this case?

A. I am providing evidence on behalf of Utah Clean Energy, the Alliance for Solar Choice, (TASC) and Sierra Club (together the "Joint Parties").

Q. What is the purpose of your sur-rebuttal testimony?

A. The purpose of my sur-rebuttal testimony is to respond to the rebuttal testimonies presented by Rocky Mountain Power (RMP), the Office of Consumer Services (OCS), and the Division of Public Utilities (the Division), and to clarify apparent misunderstandings of the Joint Parties' proposal for an analytical framework for evaluating the costs and benefits of the net metering (NEM) program.

2. RECMMENDATION FOR A NEM BENEFIT-COST FRAMEWORK

Q. Please begin by summarizing your primary recommendation for how to evaluate the costs and benefits of NEM.

A. My recommendation is fairly simple. It has three elements to it:

- Two different metrics are necessary to understand the costs and benefits of NEM on all customers: a cost impact analysis (i.e. revenue requirements for RMP's system), and a rate impact analysis (i.e. non-NEM customer impact).

- To examine costs and benefits to the utility's system, a cost impact analysis should be conducted in terms of the net present value of revenue requirements (PVRR), which is the same framework that is used to evaluate the costs and benefits of all other types of electricity resources in Utah.

- To examine the costs and benefits to non-NEM customers, a rate impact analysis should build off of the methodologies and inputs to the cost impact analysis, and should indicate the short-term *and* long-term impacts on customer rates as a result of NEM.

The results of the cost impact analysis will indicate the net benefits (costs) of NEM to the utility system and all customers as a whole; in other words the extent to which NEM will reduce (or increase) revenue requirements. The result of the rate impact analysis will indicate the extent to which non-NEM customers will be affected by any cost-shifting that occurs as a result of NEM; in other words the extent to which NEM will increase (or reduce) customer rates. Taken together, these two analyses will provide an indication of the costs and benefits the Company's system will incur from NEM, and the costs and benefits that other non-NEM customers will incur from NEM. These results can then be used as inputs and considerations to a subsequent rate design process.

3. SUMMARY OF KEY REBUTTAL ARGUMENTS FROM OTHER PARTIES

Q. Are there any overarching points about the other parties' rebuttal that you would like to make?

A. Yes. The most striking part of the other parties' rebuttal testimonies is what is missing from them. None of the other parties provide a meaningful rebuttal to the two key elements of my proposal. In particular:

- Cost impact analysis. None of the other parties explain why the costs and benefits of NEM resources should be evaluated using a different methodology than that used for other resources and for integrated resource planning in Utah and elsewhere. The only arguments that are provided are based on the notion that such a methodology cannot be used for setting rates. However, as described below, setting rates is not the purpose of this docket. The Commission directed parties in this docket to develop the benefit-cost framework, which is what the Joint Parties have done.

- Rate impact analysis. None of the other parties explain why a sound, long-term rate impact analysis cannot or does not provide a useful indication of the extent to which costs might be shifted between NEM and non-NEM customers.

In the absence of meaningful rebuttal arguments to these two key recommendations of my proposal, the Commission should conclude that they are sound recommendations and should be used for the NEM cost-benefit framework.

Q. Please summarize some of the key arguments that other parties make to rebut your proposal.

A. Several of the other parties made similar arguments on three points, whichI would like to address up front. First, some parties argued that my proposal cannot be used to set rates. RMP argues that "The Utility Cost test is an important tool for determining the cost-effectiveness of resource acquisition. However it is not used to set rates."[1] Similarly, DPU argued that "Mr. Woolf's analysis can have no real application to the setting of rates."[2]

Second, some parties challenge the way that I have characterized lost revenues, and the impacts that lost revenues have on evaluating NEM costs and benefits. RMP contests my point that lost revenues are not a new, incremental cost, and notes that "NEM customers are currently compensated for their excess generation at full retail rates. This is an incremental cost that will ultimately be paid for by non-participating customers."[3] RMP also contests my point that lost revenues should not be included in the cost impact analysis because they represent existing costs that are recovered from NEM customers regardless of whether NEM exists.[4] OCS agrees with me that the RIM test (which includes lost revenues) should not be used to analyze NEM costs and benefits, but argues

[1] Steward Rebuttal Testimony, page 6, lines 120-121.
[2] Davis Rebuttal Testimony, page 8, line 145.
[3] Clements Rebuttal Testimony, page 19, lines 398-400.
[4] Steward Rebuttal Testimony, page 8, lines 162-171.

that no party has proposed the RIM test in this proceeding and therefore it does not warrant further discussion.[5]

Third, some parties argued with the comment in my direct testimony that "PV generation is essentially a free resource to the utility system, and it is provided at a time when power costs are typically at their highest." RMP argued that PV generation is not free, and that it does not necessarily occur at peak hours.[6] DPU also argued that PV generation does not necessarily occur at peak hours.[7]

I address these points in the following sections.

4. BENEFIT-COST ANALYSES AND RATE DESIGN

Q. Do you agree with the rebuttal critique that your proposal cannot be used for setting rates or rate design?

A. No, although it is important to be clear that the cost-benefit framework, in and of itself, should not be used for setting rates or for rate design anyway. Cost-benefit analyses are never used for setting rates or for rate design. Cost-benefit analyses are used for the purpose of determining which resources the utility should acquire. Once the resource acquisition determination has been made, then rates can be designed in such a way as to address cost causation and customer equity issues. The Commission has been clear that the benefit-cost analysis should be a separate exercise from the rate-setting and rate

[5] Beck Rebuttal Testimony, pages 3-4, lines 56-72.
[6] Clements Rebuttal Testimony, pages 17-8, lines 362-394.
[7] Davis Rebuttal Testimony, page 9, lines 164-176.

design process. These rebuttal points are further evidence that the other parties have conflated the purposes and the practices of cost-benefit analyses and rate design.

Furthermore, it is important to be clear that the results of the benefit-cost analysis should be used as inputs for rate design. In other words, the rate design considerations should be made *in light of* the benefit-cost analysis. In this way, my NEM cost-benefit framework proposal can most certainly be used in setting rates and in rate design. However, it is used as an input to the rate design decisions; the rate design decisions are not used as an input to the cost-benefit analysis.

5. LOST REVENUES AND COST SHIFTING

Q. Do you agree with the rebuttal arguments that lost revenues should be included in the cost-benefit analysis?

A. No, not at all. It is very important to be clear about the role of lost revenues because they are central to the issue of cost-shifting. The Company states that NEM customers are "paid" for their generation at an amount equal to their retail rate. In fact, from the perspective of the utility, and the perspective of revenue requirements, there is no such "payment," i.e., no money flows directly from the Company (or other ratepayers) to the NEM customer as a result of the PV generation. Instead, what happens is that the NEM customer pays the Company less than it otherwise would have. In other words, the Company *recovers less revenues* than it otherwise would have. These are commonly referred to as lost revenues, and these occur with energy efficiency resources as well as customer-side PV.

Q. Why are lost revenues from customer-side PV such an important issue?

A. Lost revenues from customer-side PV are an important issue because they can ultimately lead to cost-shifting between NEM and non-NEM customers. This occurs because electricity rates include both variable ad fixed costs. Customer-side PV can avoid the variable system costs embedded in rates, but not the fixed costs (at least in the short-term). Therefore, lost revenues result in "lost contribution to fixed costs." If the utility does not recover the full contribution to fixed costs, then it may not collect enough revenues to cover its total costs. At the time of the next rate case, the utility will increase rates to reflect the reduced sales levels and to be sure to make up for any lost contribution to fixed costs going forward. This increase in rates will be experienced by all customers in the relevant rate class. It is this increase in rates that leads to a shifting of costs from NEM customers to non-NEM customers.

This process is why I recommend that, in addition to the cost-benefit analysis, the analytical framework also include a rate impact analysis. Before designing rates for net metering and non-net metering customers, the Commission must evaluate the cost-shifting issue by analyzing rate impacts. Once the Commission has gathered information on the costs and benefits incurred by other customers from the net metering program, then it can develop rates in light of those costs and benefits. Rate design is the appropriate mechanism to address any cost shifts; limiting the acquisition of a least-cost resource is not.

Q. Do the other parties include lost revenues in their NEM benefit-cost framework?

A. Yes. Both the RMP proposal and the OCS proposal, as described by Witness Hayet, clearly include lost revenues in the calculation of NEM costs.[8]

Q. Witness Beck claims that no party in this docket is proposing the RIM test, and therefore it does not warrant discussion. Do you agree?

A. No. The only difference between the Utility Cost test and the RIM test is that the RIM test includes lost revenues. In my view, any benefit-cost analysis that includes lost revenues is essentially the same as the RIM test. While some parties may not wish to call it the RIM test, there is no question that including lost revenues in the benefit-cost analysis is essentially equivalent to using the RIM test.

As noted above, other parties do include lost revenues in their proposed cost-benefit frameworks, so there is no question that lost revenues are relevant to this discussion. In fact, lost revenues are the primary contribution to the most vexing issue in this entire docket: how to address the impacts of cost-shifting.

Q. How do you recommend that lost revenues, and related cost-shifting, be addressed in the NEM benefit-cost framework?

A. Lost revenues should not be included in the cost impact analysis. As I describe in my direct testimony, lost revenues are not a new cost, do not affect revenue requirements,

[8] Clements Direct Testimony, pages 10-11, lines 230-237; Hayet Direct Testimony, page 9, lines 200-207.

and will not increase *revenue requirements* regardless of the NEM generation, and therefore, they should not be included in the cost-impact analysis.

However, lost revenues *should be* considered in the rate impact analysis. The very purpose of the rate impact analysis is to estimate the likely impact on customers as a result of any cost shifting from NEM, *which is caused by lost revenues from NEM*.

In my illustrative rate impact analysis, the lost revenues are included in the calculations. This is achieved by estimating future rates in the "With PV" case in such a way that the utility is allowed to recover its costs despite the reduced rates in that case. Figures 1 and 2 in my direct testimony indicate what the magnitude of the lost revenues are likely to be under the cases analyzed.

6. PV GENERATION IS A VERY LOW-COST RESOURCE

Q. Do you agree with the rebuttal to your statement that PV generation is essentially a free resource?

A. No, I do not agree with the rebuttal testimony on these points. First, I acknowledge that NEM may require some costs from the utility, in terms of administration costs and costs for supporting the distribution grid. For this reason, I include these costs in my cost impact analysis.[9] My point here is that the vast majority of the costs of the power, the equipment cost, the installation cost and any maintenance costs, are paid for by the host customer, not the utility and not the other customers. Therefore, this power is

[9] Woolf Rebuttal Testimony, pages 34-35, lines 645-654.

"essentially" free. Maybe it would be more accurate to say that this power is "very low cost."

With regard to the timing of the PV generation relative to peak demands, I was just making a very general point. This point about the timing of PV generation does not in any way undermine the NEM cost-benefit framework that I have proposed. In general, the cost-benefit analysis should use the best information available to determine the avoided costs of PV for when it is likely to be generating.

7. OTHER REBUTTAL ARGUMENTS

Q. RMP argues that the DSM cost-benefit tests are not relevant for analyzing the costs and benefits of NEM. Do you agree?

A. No. I address the arguments made by the Company on this point in my rebuttal testimony.[10] In sum, there is no meaningful difference between DSM and NEM resources that would warrant fundamentally different treatment in evaluating cost-effectiveness. The Company argues that the DSM tests would have to be fundamentally altered in order to be used for NEM.[11] This is simply not true. The Utility Cost test can, and should, be used for the cost impact analysis; there is no need for any modifications to the structure of that test.

[10] Woolf Rebuttal Testimony, pages 17-20, lines 312-383.
[11] Steward Rebuttal Testimony, pages 7-8, lines 155-161.

It is fair to say that the Utility Cost test would need to be *supplemented* by analysis of the cost-shifting, lost revenues, and rate impacts of NEM. But this does not require a new or a modified test, as this can be achieved with a rate impact analysis.[12]

Q. Some parties argue that the avoided costs used in your illustrative analysis are too high or too speculative.[13] Do you agree?

A. No. Again, this topic is not central to my testimony, and is addressed in the testimony of Witness Norris for the Joint Parties. In general, the cost-benefit analysis should use the best information available to determine the avoided costs of PV. This criticism of my testimony has no bearing on the validity of my central recommendations for an analytical framework for how to analyze the costs and benefits of NEM to the utility system, including non-NEM customers.

Q. OCS claims that you have mischaracterized the effect that NEM credits will have on the low-income discounted rates, and on revenue requirements.[14] Do you agree?

A. No. Witness Beck does not explain why she believes it is a mischaracterization. It is simply a fact that any NEM credits that remain at the end of a year will be used to help pay for the low-income discount rate, reducing the revenue otherwise required in the absence of the credits. Any such reduced revenue requirements would represent a benefit to all the customers that contribute to the low-income discount rate.

[12] I have argued in several contexts that rate impact analyses should be applied to DSM, to supplement the results of the benefit-cost analysis, for the same reasons that they should be applied to NEM benefit-cost analyses.
[13] Clements Rebuttal Testimony, page 16, lines 347-358; Hayet Rebuttal Testimony, pages 13-14, lines 263-277.
[14] Beck Rebuttal Testimony, page 8, lines 173-176.

Q. DPU claims that your proposal would rely upon IRP information that is not necessarily relevant to NEM.[15] Do you agree?

A. No. Witness Davis refers to several elements of the Company's current IRP, and notes that some of them are not consistent with the addition of PV to the RMP system. While this may be true, these points do not suggest that my proposal is inappropriate. I am not suggesting that the Company's current IRP be used for this purpose, or necessarily any future IRP if it is not consistent with NEM development. My primary point is that the central underlying methodology of evaluating resources in an IRP, by using the present value of revenue requirements, should be used for the NEM cost-benefit analysis.[16]

8. CONCLUSIONS AND RECOMMENDATIONS

Q. Are any of the arguments made by other parties in their rebuttal testimonies meaningful, or compelling enough to suggest that your analytical framework is not appropriate or should be modified in any way?

A. No. None of the parties provided any compelling evidence as to why the costs and benefits of NEM should be treated any differently than other electricity resources. Instead, the criticism from other parties stems from the conflation of cost-effectiveness and rate design. None of the parties provided any evidence to suggest that long-term rate impact analyses cannot, or should not, be used to indicate the extent to which NEM might

[15] Davis Rebuttal Testimony, page, 10 lines 184-193.

[16] Ideally, the IRP inputs and assumptions will be consistent enough with the development of NEM that the IRP, or certain elements of the IRP, can be used for assessing the cost impacts of NEM.

result in the shifting of costs from NEM customers to NEM customers, or that these results could not inform subsequent rate design determinations.

Q. Please summarize your recommendations.

A. I continue to stand by all of the recommendations provided in my direct testimony. In particular:

- The Commission should re-affirm that a cost-benefit analysis should be conducted separately from rate design determinations, and clarify that rate design alternatives should be considered *in light of* the results of the benefit-cost analysis.
- The Commission should require that the NEM cost impact analysis be based on net present value of revenue requirements, consistent with the conventional practice of evaluating all types of supply-side and demand-side resources in Utah.
- The Commission should clarify that lost revenues from distributed generation resources should not be included in the cost impact analysis in any way.
- The Commission should require the Company to conduct a rate impact analysis, which does account for lost revenues and cost shifting, to indicate the extent to which customers who do not install distributed generation resources might incur costs from those who do.

Q. Does this conclude your sur-rebuttal testimony?

A. Yes, it does.