

BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

UM 1716

In the Matter of

PUBLIC UTILITY COMMISSION OF
OREGON,

Investigation to Determine the Resource
Value of Solar.

THE ALLIANCE FOR SOLAR CHOICE

RESPONSE TESTIMONY

OF

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June 30, 2016

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1 I. INTRODUCTION / QUALIFICATIONS

2

3 **Q1: Please state for the record your name, position, and business address.**4 A1: My name is Eliah Gilfenbaum. I am Deputy Director of Policy and Electricity Markets at
5 SolarCity. My business address is 444 De Haro Street, San Francisco CA 94110.

6

7 **Q2: Have you previously testified before this Commission?**

8 A2: No, I have not.

9

10 **Q: On whose behalf are you appearing in these proceedings?**11 A: I am appearing on behalf of The Alliance for Solar Choice (TASC). TASC leads
12 advocacy across the country for the rooftop solar industry and advocates for maintaining
13 successful distributed solar generation policies throughout the United States.
14 TASC's member companies are actively involved in Oregon's growing distributed
15 generation industry. TASC's members are responsible for tens of thousands of
16 residential, school and commercial solar installations across the country and have brought
17 thousands of jobs and many tens of millions of dollars of investment to the nation's cities
18 and towns. TASC was formed on the belief that everyone should have the option to
19 switch to distributed solar generation for at least a portion of their energy supply and to
20 realize the financial benefits thereof.

21

22 **Q: What is your experience with solar valuation studies and cost-effectiveness tests?**23 A: I have over 10 years of experience in the energy industry working on carbon markets,
24 renewable energy procurement, utility resource planning, and rate design. I spent 4 years
25 at Pacific Gas & Electric (PG&E) as an expert analyst in their resource planning
26 department, where I conducted various types of modeling that was incorporated into
27 resource valuation protocols. Examples include Loss of Load Probability (LOLP) studies
28 to assess the Effective Load Carrying Capability (ELCC) and capacity value of renewable
29 resources, and production cost modeling to assess resource integration costs.

1 In that role I also familiarized myself with various approaches to avoided cost modeling
2 for the cost-effectiveness evaluation of demand side resources. Since joining SolarCity's
3 Policy and Electricity Markets team two years ago, I have participated in various
4 proceedings across the country focused on rate design and calculating the value of
5 distributed energy resources. While I have not sponsored expert testimony in these cases
6 myself, I have been heavily engaged in a number of General Rate Cases (GRCs) and
7 cost-benefit proceedings during this time.

8
9 **Q: Do you have experience with other models created by E3 for the purpose of**
10 **quantifying the costs and benefits of distributed resources?**

11 A: Yes. I have used various iterations of the "E3 Calculator" referenced by Witness Olsen
12 and which has served as the basis for cost effectiveness evaluations around the country. I
13 am very familiar with the avoided cost calculator used for E3's 2013 California NEM
14 Impacts Evaluation paper¹. I have also extensively used the NV NEM Public Tool, and
15 the even more sophisticated CA NEM Public Tool, which was the basis for parties'
16 modeling of alternative rate structures within the NEM Successor Tariff proceeding at the
17 California Public Utilities Commission.

18
19 **Q: What is the purpose of this testimony?**

20 A: My testimony in this proceeding is meant to help inform the development of E3's Public
21 Tool presented by Mr. Olsen in staff's direct testimony. TASC's goal is to ensure that the
22 tool appropriately recognizes all of the potential value attributable to distributed energy
23 resources, and that the data inputs into the tool are sufficiently transparent and well-
24 vetted before the outputs of the tool are used as the basis for decision-making.

25
26 III. IMPRESSIONS OF THE E3 TOOL AND PRINCIPLES FOR DATA INPUTS

27
28 **Q: What are your overall impressions of the valuation framework that Witness Olsen**
29 **has presented in his testimony?**

¹ http://www.ethree.com/documents/CSI/CPUC_NEM_Draft_Report_9-26-13.pdf

1 **A:** E3 has built a flexible and transparent tool to assess the value of distributed solar
2 resources, drawing from the standard framework it has used in other states. The valuation
3 framework relies on utilities developing input data that can be entered into the tool,
4 which then applies standard calculations to those inputs to arrive at an hourly avoided
5 cost profile.

6

7 **Q: Is the tool's flexibility a good thing?**

8 **A:** Yes and no. As is the case in all modeling efforts, the outputs of this tool are only as good
9 as the data it is populated with. Creating some amount of flexibility in the tool is a good
10 thing in that it allows different utilities to run the model with information specific to their
11 utility service area. However, creating a tool with too much flexibility also creates the
12 possibility of sub-par data being entered in, leading to lower quality results. This is not
13 necessarily a problem with the tool itself, but highlights the importance of setting
14 standards for the quality of the model inputs.

15

16 Given the tool's flexibility, it is possible that each utility might take a different approach
17 to developing the inputs given data availability and methodological differences in their
18 planning processes. This opens up the possibility that differences in value across utilities
19 could stem more from variations in data availability and methodological choices rather
20 than from any inherent differences in the value of the solar resource itself. This would be
21 an unfortunate outcome. Ensuring some degree of methodological consistency in
22 developing the input assumptions will help ensure that the results are useful and
23 comparable across utilities.

24

25 **Q: What would you recommend to address this concern?**

26 **A:** TASC suggests that any Commission decision in this Phase 1 of the proceeding should
27 include guidance with respect to the inputs used within the tool, and should acknowledge
28 the fact that entering in an incomplete set of inputs, or inputs with insufficient granularity
29 or which are derived from a problematic methodology, will not lead to a comprehensive
30 assessment of the full value of solar.

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TASC recommends that the following principles be formally recognized by the Commission in this proceeding:

- **Transparency:** Any datasets used by utilities in this proceeding should be publicly available. Stakeholders should have an opportunity to review these datasets, and propound discovery on utilities in order to understand how they were derived. **Granularity:** Wherever possible, inputs with hourly granularity should be used. As described in greater detail below, using data averaged over longer time periods has the potential to underestimate the value that solar provides toward system reliability and the ability to avoid or defer marginal infrastructure investments.
- **Completeness:** Utilities should be required to populate all avoided cost categories by choosing from a suite of approved methodologies. If data is not available to use one of the approved methodologies, then the Commission should find that the assessment of value is incomplete and inadequate, and should not be a sufficient basis for rate making. A avoided cost category should not be assigned zero value simply because the value is uncertain or difficult to quantify.

Q: With respect to completeness, does the tool provide a methodology for calculating the value of all benefits of distributed solar resources.

A: It does not, but my understanding is that this is the result of a previous Commission Decision that sought to focus the evaluation of benefits on those costs that are directly avoidable by the utility, and which therefore directly benefit non-participating ratepayers. For this reason, the tool excludes all potential societal benefits.

Q: Would it be beneficial for the tool to include placeholders for these categories, even if determining specific values remains outside the scope of this proceeding?

A: I believe it would. While the Commission has already determined that for a generic VOS methodology, it will only focus on direct impacts to utility costs, Sec. 757.300(6) of the Oregon Revised Statutes provides specific requirements that may necessitate

1 modification to the methodology contemplated in this proceeding if it is to be used in the
2 future to assess NEM successor tariffs:

3
4 *Sec. 757.300(6): When limiting net metering obligations under this subsection, the*
5 *commission or the governing body shall consider the environmental and other public*
6 *policy benefits of net metering systems.*

7
8 Rather than risking the possibility of having to significantly modify the tool at a later
9 date, it may be prudent to create placeholders within the tool to assess the types of values
10 referenced in statute, even if those placeholders are set to zero for purposes of this
11 proceeding.

12
13 **IV. EXAMPLES OF DIFFERENT METHODOLOGICAL CHOICES FOR MODEL**
14 **INPUTS**

15
16 **Q: Would you consider the development of some of the inputs into the tool to require**
17 **methodological choices?**

18 **A:** Yes, I would. While the emphasis of this Phase 1 of the proceeding is focused on
19 methodology, I believe it's important to highlight that many of the inputs for E3's model
20 are actually the outputs from separate analyses. Without taking into account that separate
21 analysis, it would be difficult to conclude whether the inputs into the tool are adequate,
22 and therefore whether the results are reasonable.

23
24 **Q: Could you provide some examples?**

25 **A:** Yes. Below I describe two examples of input assumptions which have a large impact on
26 capacity-related values, and where there are a variety of different methodologies resulting
27 in potentially different results.

28
29 **Contribution to Peak:**

30 There are a number of different methodologies that can used to determine the reliability
31 contribution of solar resources. One of the most accurate approaches is to calculate a

1 metric called the Effective Load Carrying Capacity (ELCC). This approach essentially
2 compares a given resource's contribution to system reliability to a "perfect resource" that
3 would be available 100% of the time at its full nameplate capacity. A resource with 50%
4 ELCC would contribute half as much toward system reliability as a perfect resource. Said
5 another way, twice as many nameplate MWs of the given resource would be required to
6 deliver the same reliability value as a perfect resource. This type of modeling requires
7 multiple iterations of a Loss of Load Probability (LOLP) model to look at reliability
8 metrics under different resource portfolio assumptions.

9
10 Short of a full ELCC analysis, a typical LOLP model can be used to assign a probability
11 of a system outage to each hour of the year, and then look at the coincidence of solar
12 generation with each of those outage probabilities to determine the full contribution to
13 peak. This is the methodology described in Witness Olsen's testimony on p.30-32.

14
15 A shortcut approach is sometimes used in assigning capacity value to hours of the year,
16 whereby a utility might look at the hours with the highest load and make the assumption
17 that those historical high load hours correlate with the hours that are most likely to lead to
18 an outage. Using the top 250 or 150 hours, for example, is a common practice.

19
20 In the extreme, a utility may claim that solar's contribution to peak is limited to the
21 amount it would have generated in the single peak hour of the previous year. This is the
22 least accurate approach, and is problematic in my opinion because it doesn't recognize
23 that there is uncertainty as to when the peak hour will occur in the future, and it doesn't
24 recognize that there is reliability value in hours other than the absolute peak of the year.

25
26 **Resource Deficiency Year:**

27 The year in which new resources are needed has a significant impact on the generation
28 capacity value attributable to distributed generation, and can be looked at in several ways.
29 Some utilities create forecasts of demand side resources and incorporate those forecasts
30 into their load and resource balance tables when assessing the year in which a capacity

1 shortfall is likely to occur. For example, Pacificorp, in its 2015 IRP process,
2 commissioned a report from Navigant Consulting to develop distributed generation
3 penetration forecasts for use in its resource planning studies. These DG forecasts were
4 then applied as a reduction to forecasted load in those studies. By looking at an integrated
5 portfolio which includes both demand and supply side resources, a utility may determine
6 that new resources are not needed until further in the future. Including only supply side
7 resources (or only resources that are owned or contracted by the utility) will lead to a
8 smaller portfolio and a larger net short position in earlier years.

9
10 IV. THE IMPORTANCE OF HOURLY DATA

11
12 **Q: Does the E3 model create avoided cost outputs with hourly granularity?**

13 **A:** It is capable of doing so, but as witness Dolezel notes in her testimony on p.6, “to achieve
14 outputs from the model at hourly granularity demands that the input data from the utilities
15 must be at hourly precision.”

16
17 **Q: Based on staff’s testimony, which data from utilities is available with hourly
18 granularity?**

19 **A:** As Witness Dolezel notes, energy cost data was one category where utilities tended to
20 have good hourly data readily available. However, “a good portion of the data provided
21 by utilities for testing the model was much less granular.” While it is unclear from staff’s
22 testimony exactly which data is unavailable with hourly precision, Witness Dolezel’s
23 statement seems to imply that the majority of non-energy values could not be calculated
24 based on hourly data.

25
26 **Q: In your view, how important is it to use data with hourly precision as an input into
27 this model?**

28 **A:** It is potentially very important. For example, if data for the cost of energy were only
29 available as daily or weekly averages, one would lose very important information about
30 which hours are of higher value, and about the magnitude and frequency of these price

1 differentials. Given that solar is only generating during a specific subset of those hours,
2 the value attributable to solar can be underestimated if high value hours when solar is
3 generating are averaged across low value hours when solar is not generating. In other
4 words, capturing the coincidence between solar generation and those variations in hourly
5 price is important in order to accurately reflect the avoided energy costs.

6
7 Hourly data is equally important for calculating the non-energy value categories. As
8 described in Witness Olsens's testimony on p.31-32, the calculation of generation
9 capacity, transmission, and distribution avoided costs all seem to depend on hourly
10 inputs. In the case of generation, for example, the SolarLOLPCoincidence term cannot be
11 calculated without hourly LOLP data. Similarly for T&D, the proper calculation depends
12 on hourly probability allocators to spread the marginal cost value to the appropriate hours
13 of the year, which in turn is used to determine coincidence with solar generation. In the
14 absence of hourly data, it is unclear exactly how utilities would populate the tool in order
15 to appropriately calculate these avoided capacity values.

16
17 **Q: If hourly data is not available, as Witness Dolezel suggests it is not for a number of**
18 **these categories, is it clear from Staff's testimony how the model can incorporate**
19 **non-hourly data and still come to reasonable results.**

20 **A:** No, it is not clear. The methodological descriptions on p.31-32 of Witness Olsen's
21 testimony characterize a methodology using hourly data. If that data is not available or
22 cannot be calculated by the utility, it is unclear how those avoided cost categories can be
23 properly valued. On the 'General Inputs' tab of the E3 Tool, there are cells to enter in
24 annual values for certain inputs such as annual average energy price and annual average
25 contribution to peak. But there is no description of how utilities should develop those
26 annual values.

27
28 **Q: What would you recommend to ensure that the input data into this model meet the**
29 **principles of Granularity and Completeness?**

1 A: I would recommend that the Commission give some form of guidance or create a set of
2 requirements around the input data for the E3 model. While the tool provides a flexible
3 framework for utilities to use in assessing the value of solar, it does not ensure that the
4 inputs are adequate to assess this value with sufficient accuracy.

5
6 This kind of guidance would help ensure that an adequate amount of rigor is applied to
7 developing these inputs. While the Commission has ordered that the first phase of this
8 investigation will examine the appropriate value categories, and methodologies for
9 assessing those values, I would argue that the way in which the inputs are derived is an
10 inherent part of those methodologies. Without any guidance about the development of
11 these input assumptions, the tool does not by itself ensure a proper accounting of the
12 value of solar.

13

14 **Q: Does this conclude your prepared testimony?**

15 A: Yes, it does.