

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA



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Order Instituting Rulemaking to Develop a
Successor to Existing Net Energy Metering
Tariffs Pursuant to Public Utilities Code Section
2827.1, and to Address Other Issues Related to
Net Energy Metering.

Rulemaking 14-07-002
(Filed July 10, 2014)

**COMMENTS OF THE OFFICE OF RATEPAYER ADVOCATES ON
ADMINISTRATIVE LAW JUDGE'S RULING SEEKING COMMENTS
ON DRAFT VERSION OF PUBLIC TOOL**

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I. INTRODUCTION

On April 15, 2015, the Administrative Law Judge (ALJ) issued a ruling requesting suggestions for improvements to the draft version of the “Public Tool,” a spreadsheet based calculator that the Commission’s Energy Division has developed for the purpose of estimating the cost-effectiveness of alternative successor tariff proposals. The Office of Ratepayer Advocates (ORA) submits these comments in response to the ALJ ruling.

ORA appreciates the effort that the Energy Division (ED) staff and their contractor, Energy and Environmental Economics (E3), have put into developing the Public Tool and obtaining parties’ input on the Public Tool data inputs and methodologies. The Public Tool is an incredibly complex and ambitious project. As ORA discusses in response to the ALJ’s questions below, the Public Tool requires additional Quality Control (QC), additional documentation, and additional functionality before it can be used to test parties’ successor tariff proposals.

ORA is having difficulty understanding and testing the functionality that drives solar adoption within the Public Tool, and thus has not been able to confidently validate the suitability of the solar adoption functionality for use as a policy planning tool. For example, ORA attempted to run a Value Based Compensation scenario using current rates with a \$0.02 per kWh societal adder and Social Costs of Carbon at \$20 per tonne CO2 escalated at 5% to calculate adoptions for PG&E residential and small commercial, but this scenario resulted in nearly zero incremental adoption even though the Participant Test ratio was greater than 1. Collaboration with other parties confirmed that there are other critical problems with the Public Tool Adoption functionality. ORA learned that other parties are producing similarly erroneous solar adoption results by making simple modifications to key variables, such an extension of the Income Tax Credit (ITC) at 30% and improbably high utility rate escalation factors. These counter-intuitive model outputs coupled with the fact that testing a scenario takes 3-4 hours to run even when simplifying

run-time inputs (e.g. selecting a single utility and only two customer segments) is resulting in an extremely slow process to model even a modest number of scenarios.¹

ORA recommends that the Commission take a step back and first demonstrate that the Public Tool can produce reasonably accurate and reliable results. Until then, the Commission should refrain from using the Public Tool to make policy decisions. In the meantime, ORA recommends that the Commission proceed with a schedule for parties' proposals while improvements are made to the Public Tool in parallel. If the Commission is to stay on schedule to meet the statutory deadline to develop an alternative NEM tariff by December 31, 2015, the scoping memo anticipates party proposals (and comments and reply comments on proposals) during the second quarter of 2015. In other words, parties will need to prepare proposals, evaluate other parties' proposals, and simulate alternate proposals on a final Public Tool or a similar but reliable model by the end of June. Parties will struggle to find the resources to prepare proposals *and* continue to QC the Public Tool all within the next two months. ORA recommends that the deadline for parties' proposals be extended for at least one month after the Public Tool is generating accurate and reliable results. Additionally, ORA suggests that parties should not bear the burden of demonstrating that there are flaws and quality problems with the Public Tool. As long as the Commission requires parties' proposals to be modelled using the Public Tool, the Commission and its consultants should first be able to satisfy for themselves that the Public Tool does not contain critical errors and quality issues. The Commission should take analysis done using the Public Tool as advisory, and allow alternative analysis to be presented as part of the record.

The Public Tool need not be used as an up-front requirement prior to designing successor tariffs. For example, ORA expects to prepare a successor tariff proposal for the Commission's consideration that will not necessarily require a forecast of solar adoption. ORA's proposed program will phase out the embedded NEM subsidy as incremental

¹ ORA attempted a model run which included all three utilities for all sectors which crashed after running for 6 hours.

solar adoption occurs. So the Commission can ensure that any NEM compensation step-down occurs only after solar adoption milestones occur (similar to the California Solar Initiative (CSI) incentive step-down).

If fixing the solar adoption forecast functionality in the Public Tool proves to be too difficult to implement within the limited time available, Energy Division should consider simplifying the Public Tool. Perhaps the solar adoption functionality in the Public Tool can be disabled and the analysis can be focused on the evaluation of the costs and benefits of NEM-alternatives. Interestingly, ORA has reviewed the Public Tool RFP and found that modeling solar adoption was not even mentioned.² In the event that the solar adoption functionality of the Public Tool cannot be turned off without impacting the model results of the remaining functionality, Energy Division should also consider reverting back to the 2013 NEM cost-effectiveness study (NEM 2013 Model)³ with updated rate structures and utility data. Finally, the uncertainty of residential rate design is beginning to be resolved with the release of a Proposed Decision in R.12-06-013, the Residential Rate Rulemaking (RR PD)⁴. The Public Tool or the NEM 2013 Model could be simplified to model successor tariffs only under the rate design in the RR PD as a basis for comparing successor tariff proposals.

² <https://www.bidsync.com/bidsync-app-web/vendor/links/BidDetail.xhtml?bidid=1956062&roundId=null>;

Public Tool Statement of Work: Develop a public tool that evaluates the costs and benefits of NEM-alternatives under a set of forecasted rate structures, from the vantage point of all customers and eligible customer-generators (CGs). At a minimum, the cost-effectiveness analysis for customer-generators should include information on the expected payback period and the internal rate of return of the generation system. Also included should be an updated analysis of the current NEM program, using the same dataset/methodologies from the October 2013 California NEM Ratepayer Impacts Evaluation with updates to the NEM program cap per AB 327 and projected rate structures. Accompanying the public tool should be documentation of the methodologies and assumptions used in the analysis, including assumptions about installed distributed generation costs and financing.

³ http://www.cpuc.ca.gov/PUC/energy/Solar/nem_cost_effectiveness_evaluation.htm

⁴ <http://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=151305677>

II. RESPOSES TO QUESTIONS

1. **Input descriptions, or documentation materials, within the draft version of the Public Tool that should be expanded or modified.**

- Provide a user's guide that identifies the underlying data and calculations that affect, or are affected by, all of the Key Drivers inputs.
- Identify the source data for "Utility Distribution Capital Expenses." Key Driver Inputs C21:23.
- Explain the underlying data and calculations that are affected by "NEM Successor (post 2017) DER Program Costs Paid By." Key Driver Inputs C27.
- Explain the underlying data and calculations for "Adoption Inputs" on Advanced DER Inputs E65:F67.
- Explain what needs to be completed, at a minimum, in the Basic Rate Inputs and the Advanced Rate Inputs tabs for typical scenarios for each of the four types of compensation structures (Full Retail Rate Credit, Cost Based Compensation, Value Based Compensation, Retail Rate Credit + Value Based Export Compensation). ORA ran a Value Based Compensation scenario that should have increased adoption, but the effect on adoption was negligible. It was not immediately clear whether this resulted from user input error or a problem with the adoption algorithm, or both.
- Provide examples or instructions that demonstrate how users can test administratively set DER compensation rates, i.e. set values for export credits that are not determined by the Public Tool cost or value based compensation algorithms. Also provide examples or instructions that demonstrate how to test administratively set export compensation rates that are differentiated by TOU period.
- Provide examples or instructions that demonstrate how users can test a New DER rate in the Advanced Rate Inputs Tab that assumes a Baseline Credit

(for example, F282 for PG&E) as well as Demand Differentiated Seasonal TOU (for example, E306:E309).

- Regarding the Marginal Generation Capacity Avoided Cost Treatment in cell C4 of the Key Drivers Input tab, it appears that the model decreases the avoided capacity costs, if desired, with increases in RPS. That is, the more excess generation costs you have (because of RPS), the lower the marginal cost. However, it does not seem to have a similar feedback loop with the DER resources. The amount of DER is frozen in time in both options. It would be helpful if documentation were provided to explain the rationale behind this difference.
- It is unclear which months are included in the summer and winter seasons; this prevents users from accurately inputting existing or proposed new time periods. Documentation should be provided to clarify what months are in the summer and winter seasons. Additionally, in order to accurately reflect what IOUs set as their summer and winter seasons, the model should allow users to change which months are in the summer and winter seasons.

2. Computational errors in the draft version of the Public Tool or the Revenue Requirement that should be corrected.

- ORA did not review the Draft Public Tool or the Revenue Requirement for computational errors. ORA recommends that computations be fully audited by independent software QC experts not associated with the Public Tool developers.
- The Tool produces counterintuitive results.
 - Small changes that intuitively should not affect the rate of adoption actually slows adoption dramatically. ORA has not yet been able to produce a scenario that continues the historical rate of adoption, even by modelling existing conditions. There are several scenarios that resulted in lower adoption than expected used the base scenario

of E3's "Workshop Existing No ZNE", 4 tier rates, 40% RPS, and 3% Utility Rate Escalation, with the following incremental modifications run independently, including:

- Base Solar Cost Case rather than High Solar Cost Case.
- Natural Gas Price set at 120% rather than 100%.
- The Resource Balance Year set at 2020 rather than 2030.
- ORA attempted to model a Retail Rate Credit + Value Based Export Compensation scenario where the New DER Rate for residential is Demand Differentiated Seasonal Time-of-Use. This scenario produced unexpectedly large negative bill savings that resulted in large negative Participant benefits and large negative RIM costs.
- When attempting to execute the model with Excel 2013, ORA received the message "Run-Time error '1004,' Method 'Range' of object '_Global failed," both at the beginning and near the end of running the simulations. Debugging was unsuccessful in restoring functionality to the model, and successful alternative solutions were not found online. "Run-Time error '1004,' Method 'Range' of object '_Global failed" seems to be associated with problems with Visual Basic code. ORA suggests that E3 investigate this error or provide a troubleshooting guide for commonly encountered problems.

4. Assumptions on advanced user inputs tabs (e.g., Advanced Rate Inputs, Advanced DER Inputs, RR Inputs) that should be added to the "Key Driver Inputs" tab.

- Whether or not an input parameter is placed in the Key Drivers tab or the advanced user input tabs doesn't seem to matter, as long as the underlying data and calculations that affect, or are affected by, parameter inputs in the advanced user tabs are sufficiently documented for the users, as described in response to question 1.

7. Changes or modifications to the draft version of the Public Tool that are necessary (not merely desirable) to improve the functionality of the Public Tool for its intended use in this proceeding.

- Because the Public Tool takes an inordinate amount of time to run scenarios on all utilities and customer segments, ORA chose to run test scenarios for a single utility (i.e., PG&E only), and with adoption forecasts for the Residential and Small Commercial customer segments only. ORA was able to run 14 scenarios summarized in the table below. These scenarios were run on spare computers or overnight since E3 advised users to have only the Public Tool open when running the model. The model generally took 3 to 4 hours to finish running, compared to the 2 hour run time estimated by the model in the Results tab, cell M20. ORA experienced two instances where the model was successfully started but had to be forced to close after running for over 6 hours and apparently freezing. Given this experience ORA is concerned that scenarios that model all utilities and customer segments will require dedicated computers and will probably take one workday for each scenario on average. The time involved to run the model may impact the ability of parties to use the final Public Tool as a mechanism to iteratively test and fine-tune multiple successor tariffs with sufficient time to prepare proposals for the Commission by the end of June. ORA requests that ED and E3 look into making modifications to the final Public Tool to improve the model run time.

Table 1: Model Runs Completed by ORA on the Draft Public Tool

Scenario	Summary
1	Workshop Existing No ZNE, 4 tier rates, 50% RPS, 3% Utility Rate Escalation
2	Workshop Existing No ZNE, 4 tier rates, 40% RPS, 3% Utility Rate Escalation
3	Workshop Existing No ZNE, 4 tier rates, 40% RPS, 3% Utility Rate Escalation, Gas Price 80%
4	Workshop Existing No ZNE, 4 tier rates, 40% RPS, 3% Utility Rate Escalation, Gas Price 120%
5	Workshop Existing No ZNE, 4 tier rates, 40% RPS, 3% Utility Rate Escalation, RBY 2020
6	Workshop Existing No ZNE, 4 tier rates, 40% RPS, 3% Utility Rate Escalation, RBY 2025
7	Workshop Existing No ZNE, 4 tier rates, 40% RPS, 3% Utility Rate Escalation, Solar Cost Base
8	Workshop Existing No ZNE, 4 tier rates, 40% RPS, 3% Utility Rate Escalation, DER Program Costs Paid by Participants
9	Workshop Existing No ZNE, 4 tier rates, 40% RPS, 5% Utility Rate Escalation
10	Workshop Existing No ZNE, 4 tier rates, 40% RPS, 7% Utility Rate Escalation
11	Workshop Existing No ZNE, 4 tier rates, 40% RPS, 3% Utility Rate Escalation, 5% Societal Discount Rate
12	Value Based Compensation, No ZNE, 4 tier rates, 40% RPS, 3% Utility Rate Escalation, 2% Societal Adder, \$20 SCC
13	Workshop Existing No ZNE, 4 tier rates, 40% RPS, 3% Utility Rate Escalation, \$50 Solar Only Fixed Monthly
14	Workshop Existing No ZNE, 4 tier rates, 40% RPS, 3% Utility Rate Escalation, \$10 Fixed Charge All Customers

- The Public Tool is slow to run scenarios and the results are embedded in a large spreadsheet file, making it difficult to compare multiple scenarios in a short time without running separate Public Tools on multiple computers and comparing multiple Public Tool files. Additionally, while the Scenarios tab can contain the results for multiple scenarios to export and re-run at a later time, there doesn't appear to be a mechanism to archive scenario results without re-running the tool. ORA attempted to copy the Results tabs from multiple scenario runs into a separate workbook to facilitate comparisons and conduct further data manipulations. Copying the results tab sometimes worked, but sometimes resulted in loss of data, or data from copied Results tabs overwriting existing Results tabs. The Results tabs appear to be dynamically linked to other tabs in the Public Tool and the Revenue Requirements workbook, which affects the transportability of the Results tab under certain circumstances. Documentation explaining how to archive and transport data and graphs from the Results tabs into a single file while preserving the integrity of results, or a feature to automate the process would help improve the usefulness of the Public Tool if it is to be used to compare different successor tariff proposals.
- The Public Tool should be modified to allow users greater flexibility in changing the TOU periods. Doing so would allow the results to more accurately reflect current and proposed TOU periods. Currently, the model only allows the user to define the TOU periods with fixed blocks of time, which does not allow a summer peak period beginning at 10 am (SCE existing), 11 am (SDG&E existing) or 1 pm (PG&E existing) or ending at 7 pm (PG&E existing) or 9 pm (PG&E proposed).
- The TOU blocks are defined in three hour increments where the first and last hours are the same as those of the adjacent blocks. For example, if the

user specifies 12-14 as mid-peak and 14-16 as on-peak it is unclear whether hour 14 ends up in the mid-peak or on-peak period.

- The Public Tool should be modified to allow users to test administratively set DER compensation rates, i.e. set values for export credits that are not determined by the Public Tool cost or value based compensation algorithms. This functionality should be available for testing flat rates as well as rates differentiated by TOU period.
- The Proposed Decision (PD) in the Residential Rate Design OIR was issued by ALJs McKinney and Halligan on April 21, 2015⁵. The PD, if adopted, would allow possible transitions in fixed charges and default variable rates in 2019. In order to accurately model the interactions between the successor tariff proposals and the residential rates, it may be necessary to modify the Public Tool to model different rate designs for different years.
- ORA suggests that ED and E3 preload standard default rate inputs based on the April 21st PD into the final version of the Public Tool, and that all parties prepare one run of their proposed successor tariff designs using the preloaded rates. This will allow for more useful comparisons across different proposals.
- Separate adoption graphs should be developed for the Results Tab which show adoption from 2017 to 2025 without historical adoption. Additionally, if historical adoption can be segmented by utility and customer segment, that would allow for more meaningful results if users wish to run a scenario on a limited number of utilities and/or customer segments.

⁵ <http://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=151305677>

III. CONCLUSION

ORA recommends that the Commission and parties shift focus towards the substance of their successor tariff proposals rather than on the details of the Public Tool. Energy Division should also consider reverting back to the 2013 NEM cost-effectiveness study (NEM 2013 Model) with updated rate structures and utility data.

Respectfully submitted,

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