BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

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COMMENTS OF THE CENTER FOR ENERGY EFFICIENCY AND RENEWABLE TECHNOLOGIES ON SCE 33% RPS INTEGRATION COST STUDY

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CENTER FOR ENERGY EFFICIENCY AND RENEWABLE TECHNOLOGIES
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The Center for Energy Efficiency and Renewable Technologies (CEERT) respectfully submits these Comments on the Report of Southern California Edison Company (SCE) on Renewable Integration Cost Study for 33% Renewables Portfolio Standard (RPS) ("33% RPS RIC Study"). These Comments have been filed and served pursuant to the Commission's Rules of Practice and Procedure, the Administrative Law Judge's (ALJ's) Ruling of March 27, 2015 ("March 27 ALJ's Ruling"), and the ALJ's Email Ruling served on June 15, 2015, granting an extension of time to file and serve these Comments to today, June 26, 2015.

I.
BACKGROUND

In the March 27 ALJ's Ruling, SCE was directed to be the project manager, in coordination with Pacific Gas and Electric Company (PG&E) and San Diego Gas and Electric Company (SDG&E), to perform "production cost simulations," the results of which "will inform the development of the variable component of the interim integration cost adder (integration adder) for use" in the RPS Least Cost-Best Fit (LCBF) procurement evaluation and the RPS Calculator.[1] This work was directed in response to Decision (D.) 14-11-042 issued in the RPS Rulemaking (R.) 11-05-005 (now succeeded by R.15-02-020), which made the adoption of a

[1] May 27 ALJ's Ruling, at p. 1.

"final methodology for the RPS integration cost adder … a top priority for the Commission."[2] Because of the complexity of doing so, the March 27 ALJ's Ruling concluded that it was reasonable to approach "the various components of the integration adder in different stages."[3]

The "first step" of this process was direction to SCE, in coordination with PG&E and SDG&E and with the use of the California Independent System Operator's (CAISO's) "PLEXOS deterministic model," to perform production cost simulation modeling "with the specified criteria" included in Attachment 1 of the March 27 ALJ's Ruling.[4] This modeling was to be divided between 33% RPS cases (due first on May 29, 2015) and then 40% RPS cases (due on August 31, 2015).[5] The results would then be used in a "second step," to be addressed in R.15-02-020 (RPS), "to calculate the variable cost component of the interim integration adder for wind and solar used for the RPS procurement LCBF evaluation and the RPS calculator."[6]

In terms of the criteria to be applied in the 33% and 40% RPS cases, Attachment 1 identified the "SCE Product Cost Simulation Requirements for the Variable Cost Component of the Interim Integration Adder." Those requirements were divided into the following categories: production simulation analysis, separation of energy value and variable integration adder, determining integration costs at 33% RPS, determining integration costs at 40% RPS, incremental wind and solar, developing the necessary data to calculate the variable integration cost at 33% RPS, and developing the necessary data to calculate the variable integration cost at 40% RPS.

On May 29, 2015, SCE filed its report on the 33% RPS RIC Study. On June 12, 2015, a joint teleconference was held in this Long Term Procurement Plan (LTPP) Rulemaking (R.13-

[2] March 27 ALJ's Ruling, at p. 3, citing D.14-11-042, at p. 53.
[3] Id., at p. 4.
[4] Id.
[5] Id., at p. 5.
[6] Id.

12-010) and R.15-02-020 (RPS) for the purpose of permitting SCE to present and respond to questions regarding the study. By these Comments, CEERT addresses the following main topics: (1) the 33% RPS RIC Study results and (2) the process for considering and applying these results in Commission proceedings.

II.
33% RPS RIC STUDY

A. 33% RPS RIC Study Results.

As an initial matter, it is CEERT's position that the 33% RPS RIC Study follows the criteria established by Attachment 1 of the May 27 ALJ's Ruling. In terms of the results achieved by the study, the 33% RPS RIC Study calculates a relatively modest variable component of $2-3/MWH for wind and for solar resources. Although CEERT believes that this result is on the high end of the range of values for this variable, it has no real quarrel with either the methodology or the result, and this value is unlikely to significantly impact any renewable procurement.

However, there are two critical caveats to CEERT's endorsement of the methodology used in the 33% RPS RIC Study and this result. First, the answer or result noted above is only accurate for the precise scenario and "marginal" renewable addition modeled[7] and is *not* a generic technology adder that can be uncritically used for *any* 33% RPS scenario. This circumstance can be demonstrated by examining the numerous ways that these results can be altered by limited changes in assumptions that, in fact, serve to mitigate uncertainty or variability of wind and solar resources.

For example, if SCE had instead added a portfolio of 500 MW of wind plus 500 MW of solar PV, the resulting wind + solar integration adder would have been lower than either of the

[7] SCE approximated a marginal value for the next MW by adding an incremental 1000 MW. (See, 33% RPS RIC Study, at pp. 12-14.)

individual technology values.[8] If an "adder" were to be calculated for concentrating solar power with storage individually (CSP w/TES), the cost of regulation or load following reserves using this technology is less than gas fired technology and would result in a negative integration adder. Adding 333 MW of solar PV plus 333 MW of wind plus 333 MW of CSP with TES, as a further example, would yield an integration adder less than either wind or solar PV or wind + solar PV.

The 33% RPS RIC model calculates an integration cost adder by multiplying the quantity of incremental regulation and load following reserves required to reliably operate the system with the added uncertainty and variability of the incremental resource addition times the price of those incremental regulation and load following reserves.[9] The quantity of regulation and load following reserves are calculated in a so-called "Step 1 Process" – the principal variable being forecast errors for load and the resources being studied.[10]

In that process, SCE did not use the exact same statistical process that the California Independent System Operator (CAISO) has adopted, but benchmarked the reserve quantity calculated with the quantity that CAISO used in the Long Term Procurement Plan (LTPP) modeling used in Phase 1a of R.13-12-010 (LTPP). This quantity is an *input* to the PLEXOS production cost model that dispatches the system and calculates the variable cost of supplying this quantity as an *output*. Neither the quantity nor the price is exclusively determined by the RPS level but can be changed independently of RPS policy. Any system change that lowers either the quantity or the price will reduce the computed adder.

Therefore, an action to improve the forecast accuracy of wind or solar output will lower the adder. It is not necessary to improve the forecasting methodology itself. Simply changing the

[8] The wind output profile is generally at a minimum at solar noon and is increasing during the afternoon ramp when solar output is waning. Thus, both the uncertainty and the ramp caused by this portfolio is less than either of the individual technology components.
[9] Here, price is equated with short run variable cost.
[10] 33% RPS RIC Study, at pp. 10-14.

CAISO tariff/business practice by moving the Residual Unit Commitment process closer to real time, as an example, 4 hours before real time, rather than 24 hours ahead, will lower the adder since the forecast errors for 4 hours ahead are significantly less than the forecast errors for 24 hours ahead regardless of the efficacy of the forecasting system itself. Such an example is not isolated, and there are numerous other ways to mitigate the impact of additional uncertainty and/or variability of wind and/or solar.

Second, the variable component of an integration adder calculated by this methodology is *not* additive to the fixed cost components of an integration adder as alluded to in the 33% RPS RIC Study.[11] Rather, any fixed cost component is at least a partial substitute for the calculated variable cost component. There is not much room to pay additional fixed cost for an additional mitigation measure to mitigate uncertainty at the adder levels calculated in this 33% example, but it is certainly possible to construct a scenario that yields a *much* higher "variable cost" component than $2-3/MWH.

One example would be to study a 50% all-incremental solar PV case. If no changes are made to the Attachment 1 criteria for this case,[12] it is certainly plausible that the methodology would calculate a "variable component" of potentially $20-30/MWH, rather than $2-3/MWH.

However, this does *not* mean that the integration cost adder for a 50% all incremental solar case would be $20-30/MWH. If, for example, a new pumped hydro storage project were added to the resource mix, the resulting revenue requirement to finance the construction of this project would almost certainly be less than the life cycle levelized cost of $20-30/MWH. Further, the true "full integration cost adder" for this 50% would be this levelized revenue

[11] See, 33% RPS RIC Study, at p. 7.
[12] March 27 ALJ's Ruling, Attachment 1.

requirement plus the recalculated variable cost component with the new pumped storage resource included in the production cost model.

The limitations on the value and meaning of the results achieved by the 33% RPS RIC Study require careful consideration by the Commission in using either as the basis for developing a "permanent" integration cost adder for renewable resources in either the LTPP or RPS procurement processes. CEERT's recommendations on whether or how to use this information in those proceedings is addressed in the following section.

B. Process for Considering and Applying Results.

Discrete, static technology specific integration cost adders at the level of renewable penetration relevant to policy at this point in time (say 50%) are not an appropriate input to the procurement process -- the portfolio effects are simply too large. The adder is too dependent on the *other* 50% of the resources sued to meet need, as well as the composition of the 50% RPS resources. Rather, the "integration adders" are really an *output* of a specific system and a specific proposed incremental procurement, the costs of which can be identified independently and considered in a real "least cost, best fit" exercise.

Thus, the appropriate place in the procurement process to consider integration cost using something like the RIC process is towards the end of the procurement process, not at the beginning. Once projects have been short-listed for viability and cost, portfolios of projects can then be subjected to something like the RIC process in the "best fit" portion of the procurement to answer questions such as the following:

- Is there another portfolio, other than the least cost one, which, although higher bid cost yields a lower "integration cost," on balance, there are greater ratepayer benefits?
- Is there a discrete non-RPS resource addition, such as either a transmission reinforcement, storage project, a new Demand Response program, or even an ISO tariff

modification, that yields integration benefits that exceed the acquisition cost of that non-RPS resource?

Procurement at this level of renewable penetrations cannot be a discrete, stand-alone process that considers only the RPS project costs and benefits in isolation. The entire system must be analyzed holistically. How all of the pieces fit together will determine the true "least cost, best fit." In that case, the 33% RPS RIC Study can serve as a valuable tool in that analysis.

III.
CONCLUSION

CEERT appreciates this opportunity to address the 33% RPS RIC Study. CEERT asks that its recommendations herein be taken into consideration in any next steps in the development or application of a renewable integration cost adder for either a 33% or 40% RPS.

Respectfully submitted,

June 26, 2015

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