BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

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Order Instituting Rulemaking to Develop an Electricity Integrated Resource Planning Framework and to Coordinate and Refine Long-Term Procurement Planning Requirements.	Rulemaking 16-02-007 (Filed February 11, 2016)
(NOT CONSOLIDATED)	
Order Instituting Rulemaking to Continue Implementation and Administration, and Consider Further Development, of California Renewables Portfolio Standard Program.	Rulemaking 15-02-020 (Filed February 26, 2015)

COMMENTS OF THE
CENTER FOR ENERGY EFFICIENCY AND RENEWABLE TECHNOLOGIES
ON JOINT ALJS' RULING ON RENEWABLE INTEGRATION COST ADDER

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The Center for Energy Efficiency and Renewable Technologies (CEERT) respectfully submits these Comments in response to the Joint Administrative Law Judges' (ALJs') Ruling Seeking Input on Report and Next Steps for Development of Renewables Integration Cost Adder (RICA) issued in R.16-02-007 (Integrated Resource Planning (IRP)) and R.15-02-020 (Renewable Portfolio Standard (RPS)) on May 11, 2016 (May 11 Joint ALJs' Ruling). These Comments are timely filed and served pursuant to the Commission's Rules of Practice and Procedure and the May 11 Joint ALJs' Ruling

I.
THE NEXT STEPS ON RICA MUST BE INFORMED NOT ONLY BY THE APRIL 4 SCE REPORT, BUT ALSO BY SB 350 RPS AMENDMENTS AND IRP PROVISIONS, AS WELL AS CURRENT SYSTEM AND GRID REQUIREMENTS.

By the May 11 Joint ALJs' Ruling, parties were given the opportunity to comment on Southern California Edison Company's (SCE's) RICA report filed on April 4, 2016 (April 4 SCE RICA Report) and questions posed by the Ruling. The questions are divided between those related to "specific analysis" in SCE's Report (including broader consideration of both "value

and cost components associated with integrating renewables") and "policy considerations and next steps."[1]

However, the May 11 Joint ALJs' Ruling also poses the more general question of "how the Commission should proceed with any further work on refining" the interim RICA adopted in Decision (D.) 14-11-042 and the "most appropriate" "venue" for "any next steps in this effort."[2] It is to these overarching issues that CEERT first responds.

In this regard, the May 11 Joint ALJs' Ruling suggests that there is a priority need for the Commission to adopt a revised RICA methodology based on an amendment to RPS Program Public Utilities (PU) Code Section 399.13 by Assembly Bill (AB) 2363 (Stats 2014, Ch. 610).[3] However, as discussed further in response to the Ruling's Question 9 *infra*, that amendment predated Senate Bill (SB) 350's changes to the same code section and subpart as well as its added provisions on Integrated Resource Planning (IRP). As explained in CEERT's Response to Question 9, this code section must now be read in light of these later changes to the PU Code. In this regard, those SB 350 statutory amendments and additions clearly raise the issue of whether this Commission's next step, especially in light of limited Staff resources, is to continue to develop a revised RICA "*or*," as the Joint Scoping Memo and Ruling of Assigned Commissioner and ALJ (Scoping Memo) recently issued in R.16-02-007 (IRP) states, develop an "alternative approach to valuing integration costs and benefits in the portfolio."[4]

On this point, it is CEERT's position that the concept that a single fixed technology specific "integration cost adder," which can be calculated or parsed into fixed and variable cost components and then used to inform procurement decisions, has been rendered moot by the

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[1] May 11 Joint ALJ's Ruling, at pp. 5, 8.
[2] Id., at pp. 1-2.
[3] Id., at p. 8, n. 4.
[4] R.16-02-007 (IRP) Scoping Memo (May 26, 2016), at pp. 10-11; emphasis added.

dramatic, sweeping changes in resource mix that the California grid is undergoing. It is not simply that such an "adder" depends on the location of the resource – that is, a rooftop PV installation in the Sunset district with early morning and late afternoon fog and low clouds is dramatically different from a single axis tracked utility scale PV installation with a 1.35 inverter loading ratio located in west Mojave. It is also not simply that such an "adder" depends on the amount of the particular technology that already exists on the grid – that is, the RICA calculated when solar was a miniscule fraction of the energy production is dramatically different from a future where solar could be 40% or more of the annual average energy production. Finally, it is not simply that some resources have complementary production profiles and, therefore, have synergistic "integration cost adders" – that is, solar PV and, e.g., New Mexico wind complement each other because the wind production is at a minimum at solar noon and increases strongly in late afternoon as the sun is setting, therefore, an "integration cost adder" for the combination is significantly less than one calculated for either resource individually.

Instead, it is the case, that, while all of the above may be true, their calculation will only lead to cost adders that are accurate for narrow, specific incremental resource additions and/or that can be strongly negative numbers, which simply overwhelm any difference in conventional levelized costs of energy calculations. Stepping back and looking at where the State is headed today in terms of energy procurement and reliability leads to the inevitable conclusion that calculating technology specific RICAs, while potentially marginally useful in certain narrow circumstances, is way down the priority list of things to do to inform the procurement process.

In this regard, it is necessary to account for the fact that not only is renewable penetration about to double from 25% of annual average energy to 50% of annual average energy, but that the State is also in the midst of: (a) retiring over 17 GW of obsolete gas fired once through

ocean cooled facilities, (b) replacing some 6 GW of over 30 year old legacy must take combined heat and power facilities with 3 GW of curtailable and partially dispatchable CHP, and (c) having lost half of the State's nuclear production, potentially losing the other half if and when Diablo Canyon is retired. In addition, the definition of the grid itself is rapidly changing from both directions, as distributed resources and active customer participation in supply and demand of energy explode from one direction while regionalization of the bulk grid is being considered from the other direction. Finally, with the emergence of both bulk and distributed storage as viable resource additions, the picture of a complete and total makeover of the grid over the next decade is clear.

Given these current and ongoing circumstances, it is simply not productive, and certainly is not a priority, to spend more time and resources on calculating "renewable integration cost adders" meant to inform marginal additions to a static grid. Instead, what is important is to deal with all of the above issues holistically; recognize that how all of the pieces fit together and work as a whole is much more important than the levelized cost of individual components; and design a range of portfolios that are "least cost/best fit" with feedback from actual procurement experience in an Integrated Resource Planning (IRP) context to guide the process. That work should be conducted and serve as a priority effort in R.16-02-007 (IRP) to apply to all resource procurement and should not be limited to or by considerations restricted to R.15-02-020 (RPS).

II.
RESPONSES TO QUESTIONS POSED BY MAY 11 JOINT ALJS' RULING

Based on CEERT's position on the RICA "exercise" as a whole detailed above, CEERT offers its responses to the key questions posed by the May 11 Joint ALJs' Ruling that are particularly relevant to the Commission's "next steps" on RICA. CEERT, however, reserves the

right to address other parties' responses to all of the questions posed by the May 11 Joint ALJs' Ruling in Reply Comments.

A. QUESTIONS ON APRIL 4 REPORT ANALYSIS

QUESTION 1

"1. *Do you agree with the primary conclusion of SCE's report that the results of this study (calculations of variable integration costs), as calculated using the tools and methodology described in the report, are unreliable? Explain why or why not*."[5]

Yes. The mathematical precision demanded by the calculation of the "differences between differences" is simply not possible in the real world. Even if such precision were possible, it would only be useful over such a narrow range of circumstances that the result would be essentially useless in the dynamically changing circumstances that this State faces, as detailed in the prior section.

QUESTION 2

"*2. Do you agree with SCE's conclusion of four major lessons learned from this study:*

a. The database should be designed for the purpose of the study;

b. The methodology should be designed with the confines of the model in mind;

c. Uncertainty in the modeling approach should be considered; and

d. A better understanding of reserve requirements and their relationship with increasing renewable penetration is needed."

Why or why not? Elaborate on which aspects of the database require further attention, which "confines" of the model must be better considered, what uncertainties are most critical (and perhaps overlooked), and/or what alternative approaches to reserve requirements should be considered.[6]

Again, while the above statements are correct, there should be no expectation that time and money spent to improve these conditions would yield useful results in the current circumstances. Instead, the Commission should step back and consider the entire problem holistically and undertake that examination in the IRP context in R.16-02-007 (IRP).

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[5] May 11 Joint ALJs' Ruling, at p. 5.

[6] Id., at p. 6.

QUESTION 8

"*8. Should the Commission discontinue efforts to isolate variable integration costs and instead holistically calculate renewables integration costs without separating the components (variable integration costs, curtailment, and fixed costs)? Why or why not? If the Commission seeks to calculate renewables integration costs holistically, how should such a holistic calculation be undertaken? Specify any models or methods that would be required*."[7]

Yes, with the qualification that at least one more level of abstraction is required. Given the nature of the problem, it is at least as important to consider the characteristics of all resources including non-renewable resources as well as wind and solar. The start time, minimum load, and forced outage rate of fossil resources; their operation as synchronous condensers to stiffen the grid during light load hours and supply energy during heavy load hours; and the lifetime, duration and synchronicity of storage devices are all at least as important as the temporal production profiles and uncertainty of these profiles for variable renewable resources, such as wind and solar.

The use of security-constrained economic dispatch production cost models, such as PLEXOS populated with accurate, configurable, regional data bases of loads and resources, will continue to be the key modeling tool. These models are used to mimic the state estimator/ economic dispatch algorithms used by the California Independent System Operator (CAISO) and other system operators and calculate the variable operating cost, including both energy and ancillary services, of any particular resource portfolio under specified loads, load shapes, natural gas and carbon prices, etc., and compare these results with the variable operating costs of any other alternate resource portfolio. The algebraic sum of the differences in variable operating costs and estimates of the fixed costs required to procure the resources in the portfolios being compared, including required advanced purchases of reservations for Resource Adequacy (RA),

[7] May 11 Joint ALJ's Ruling, at p. 7.

including Flexible RA, is then calculated to arrive at the net cost difference between the portfolios being compared.

Since these costs depend on future cost and performance of rapidly maturing technologies and uncertain input assumptions, such as the market cost of capital and future gas and carbon prices, the objective should not be to arrive at a single "optimum" portfolio for procurement. Instead, the objective should be to develop a range of diverse portfolios that are then submitted to competitive bid processes and risk analyses to guide portfolio selection while keeping the long term objective in mind. Incremental procurement should be practiced in an "adaptive management" framework, including feedback from the unfolding facts on the ground.

B. QUESTIONS ON POLICY CONSIDERATIONS AND NEXT STEPS

QUESTION 9

"*9. What future activities would you recommend the Commission undertake to further refine calculation of renewables integration costs according to the legislative requirements, [footnote omitted] considering that the result should also have a productive impact on both renewables and broader resource planning and procurement? How high a priority should it be for the Commission to undertake such activities, if any? Explain*."[8]

As noted above, there seems to be the suggestion in the May 11 Joint ALJs' Ruling that AB 2363 (Stats 2014, Ch. 610), which modified Public Utilities (PU) Section 399.13(c)(4)(A)(v)(I), makes inclusion of "expenses resulting from integration and operating eligible renewable resources" in the Utilities' RPS LCBF bid evaluations a priority and an undertaking to be accomplished in isolation from other LCBF requirements in that code section, including those more recently added by SB 350. While it is the case, that subpart (II) of that section requires the Commission to have "a methodology for determining" those "integration costs "no later than December 31, 2015," that deadline alone does not support such isolated, priority consideration of RICA.

[8] May 11 Joint ALJs' Ruling, at p. 8.

Further, as of "December 31, 2015," the Commission had in place, at least, an "interim" RICA methodology that was expressly adopted pursuant to AB 2363, among other things.[9] In fact, the Commission concluded, with citation to AB 2363: "We find that an interim approach is reasonable, especially in light of the strong interest expressed by both the parties and in the legislature in making progress on this issue."[10] Further, this approach was to remain in place until "the Commission adopts a more comprehensive approach," which was "anticipated in 2015," but not required or sunset by that date.[11]

At the time the Commission issued D.14-12-042, it did not anticipate the enactment in September 2015 of SB 350 (Stats 2015; ch. 547), which added further critical considerations to be included in the LCBF bid evaluation process, the completion of which are paramount to achieving the *new* State goals of a low carbon, reliable grid. Of most significance, while consideration of the "expenses" of integrating renewable resources is still among the list of LCBF criteria in Section 399.13(c)(4), these *new* criteria have been added along with the terms "best fit" to confirm that this bid evaluation process is to consider the value of a resource, not just its cost.[12]

Thus, Section 399.13(a)(4)(A) now requires that the "criteria for the rank ordering and selection of least-cost and best-fit eligible" RPS resources must be "on a total cost <u>and best-fit</u>" basis" and must additionally take into account:

> "(vi) Consideration of any statewide greenhouse gas emissions limit established pursuant to the California Global Warming Solutions Act of 2006 (Division 25.5 (commencing with Section 38500) of the Health and Safety Code).
>
> "(vii) Consideration of capacity and system reliability of the eligible renewable energy resource to ensure grid reliability."

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[9] D.14-12-042, at pp. 57-58.
[10] <u>Id</u>., at p. 58 and n. 146.
[11] <u>Id</u>., at p. 58.
[12] PU Code §399.13(a)(4)(A).

Given the changing circumstances of the State's energy procurement and grid detailed in Section I above, Section 399.13 must be interpreted in light of these later added provisions that are to guide RPS procurement going forward. In that circumstance, consideration of GHG emissions and grid reliability and the emphasis on "best fit" make clear that a resource's value in this regard and the incorporation of those values into the LCBF methodology are now preeminent considerations. The "interim" RICA methodology can certainly continue to serve as placeholder compliance with PU Code §399.13(c)(4)(A)(v)(I) until that work is completed.

QUESTIONS 10-13

The remaining questions relate to whether the interim RICA value should be continued for RPS resource LCBF evaluation (Question 10), whether a RICA should be developed for geothermal and biomass resources (Question 11), whether RICA should be used to inform RPS planning and procurement via a comprehensive IRP process ("an analysis that optimizes for reliability, low carbon emissions, and least cost across all resource types") (Question 12), and how parties should participate in any future development of integration cost analysis (Question 13). CEERT believes that these questions should be answered together to provide a next-steps planning process that is based on achieving the goals and IRP requirements of SB 350.

Thus, the Scoping Memo recently issued in R.16-02-007 (IRP) establishes a process for dealing with the issues described in the preceding sections of these Comments in a comprehensive manner starting with technical workshops this Summer on overall goals and portfolios designed to meet those goals.[13] CEERT strongly recommends that R16-02-007 (IRP) should serve as the appropriate venue to deal with calculation of RICA values and that these values should, in turn, serve as outputs of the holistic IRP process, not narrow, technology-specific inputs to that planning process.

[13] R.16-02-007 (IRP) Scoping Memo (May 26, 2016), at pp. 13-15.

In addition, as further indicated in the Scoping Memo in R.16-02-007 (IRP), the Commission has committed to continued interagency coordination in addressing IRP issues. That commitment could and should extend to the California Energy Commission's (CEC's) Renewable Energy Transmission Initiative (RETI) 2.0 process that could also help inform the IRP process at this Commission.

III.
CONCLUSION

CEERT appreciates this opportunity to comment on the current status and next steps on the development of a RICA. However, for the reasons stated above, it is CEERT's central recommendation that it is neither productive nor a priority, to spend more time and resources on calculating RICAs to inform marginal additions to a static grid. Instead, the Commission should be examining all issues that currently impact resource procurement and grid reliability today on a holistic basis and work toward designing a range of portfolios that are "least cost/best fit," with feedback from actual procurement experience, in the context of Integrated Resource Planning (IRP). That work should, therefore, be conducted and serve as a priority effort in R.16-02-007 (IRP) to apply to all resource procurement.

Respectfully submitted,

June 3, 2016

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VERIFICATION

(Rule 1.11)

I am the attorney for the Center for Energy Efficiency and Renewable Technologies (CEERT). Because CEERT is absent from the City and County of San Francisco, California, where I have my office, I make this verification for said party for that reason. The statements in the foregoing Comments of the Center for Energy Efficiency and Renewable Technologies on Joint ALJs' Ruling on Renewable Integration Cost Adder have been prepared and read by me and are true of my own knowledge, except as to matters which are therein stated on information or belief, and as to those matters I believe them to be true.

I declare under penalty of perjury that the foregoing is true and correct and executed on June 3, 2016, at San Francisco, California.

Respectfully submitted,

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