BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

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Order Instituting Rulemaking to Oversee the Resource Adequacy Program, Consider Program Refinements, and Establish Forward Resource Adequacy Procurement Obligations.	Rulemaking 19-11-009 (Filed November 7, 2019)

OPENING COMMENTS OF THE CENTER FOR ENERGY EFFICIENCY AND RENEWABLE TECHNOLOGIES ON PROPOSED DECISION ADOPTING LOCAL CAPACITY OBLIGATIONS FOR 2022-2024, FLEXIBLE CAPACITY OBLIGATIONS FOR 2022, AND REFINEMENTS TO THE RESOURCE ADEQUACY PROGRAM

MEGAN M. MYERS
Attorney at Law
110 Oxford Street
San Francisco, CA 94134
Telephone: (415) 994-1616
Facsimile: (415) 387-4708
E-mail: meganmmyers@yahoo.com

JAMES H. CALDWELL, JR.
1650 E. Napa Street
Sonoma, CA 95476
Telephone: (443) 621-5168
Facsimile: (415) 387-4708
E-mail: jhcaldwelljr@gmail.com

For: CENTER FOR ENERGY EFFICIENCY AND RENEWABLE TECHNOLOGIES

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Center for Energy Efficiency and Renewable Technologies (CEERT) respectfully submits these Opening Comments on the Proposed Decision Adopting Local Capacity Obligations for 2022-2024, Flexible Capacity Obligations for 2022, and Refinements to the Resource Adequacy Program, mailed in this proceeding on May 21, 2021. These Opening Comments are timely filed and served pursuant to Rule 14.3 of the Commission's Rules of Practice and Procedure, the Commission's Covid-19 Temporary Filing and Service Protocol, and the instructions accompanying the Proposed Decision.

I. THE PROPOSED DECISION MUST BE MODIFIED TO ADOPT THE CEERT PROPOSAL FOR COUNTING DIRECT CURRENT (DC) COUPLED HYBRID RESOURCES.

CEERT confines its Opening Comments to a single issue – Staff's Proposed Implementation of Decision (D.) 20-06-031 adopting a qualifying capacity (QC) methodology for hybrid and co-located resources receiving the Investment Tax Credit.[1] CEERT recommends a small, but significant, change in this proposed methodology for direct current (DC) coupled hybrids to appropriately reflect the policy adopted in D.20-06-031.

[1] R.19-11-019 (RA) Presentation 8, Day 2 Track 3b Workshop, November 23, 2020.

Throughout this proceeding, CEERT has advocated for revisions to the resource adequacy (RA) counting methodology for hybrid resources. These revisions are needed as the combination of technology, economics, and the evolving resource portfolio pursuant to adopted State energy policy to decarbonize the production of electricity and electrify other sectors of the economy has thrust hybrids to the forefront in resource planning. In this regard, the Federal Energy Regulatory Commission (FERC) has recently concluded:

> "[E]xperts in industry, academia, and at RTOs/ISOs all emphasize how quickly co-located hybrid and integrated hybrid resources have been added to interconnection queues, and the relative lack of operational experience with these resources … [A]s recently as two years ago, there were virtually no co-located hybrid or integrated hybrid resources in interconnection queues, and today there are 102 gigawatts of solar paired with storage, and 11 gigawatts of wind paired with storage in interconnection queues across the country, including both RTO/ISO regions and non-RTO/ISO regions….Various participants note the work ahead to accommodate co-located hybrid and integrated hybrid resources, but it is evident from discussions during the technical conference that RTOs/ISOs, other industry stakeholders, and the academic community are all invested in addressing terminology, defining a path for interconnection, and reviewing energy, capacity, and ancillary services market rules to determine what changes may be required to address the growing number of these hybrid resources. [2]

FERC has further ordered all regional transmission organizations (RTOs) and independent system operators (ISOs) to submit updates on efforts to deal with these issues in July 2021.[3]

In recognition of this ongoing national conversation and the evolution of broader structural reform of California's RA paradigm that occurred during this year's RA cycle, CEERT has progressively narrowed its proposal for capacity accreditation of the broad range of hybrid resources. However, CEERT agrees that appropriate implementation of the interim counting rule for hybrids in D.20-06-031 must serve in the meantime where the Proposed Decision concludes that the "Track 3.B.2" discussion on broad structural RA reform is to be addressed in a separate

[2] FERC Hybrid Resources White Paper, FERC Docket No. AD20-9-000, May 2021, at p. 6.
[3] FERC Order Requesting Reports, 174 FERC 61,034 (January 21, 2021), at p. 4.

decision forthcoming in this proceeding.[4] As such, CEERT intends to tailor its advocacy for appropriate market treatment of hybrid resources in that context.

In the pending Proposed Decision and Alternate Proposed Decision issued in R.20-05-003 (Integrated Resource Planning (IRP)), the Commission is poised to authorize near term procurement of 11.5 gigawatts of net qualifying capacity (NQC) resources using the then applicable QC methodology to meet mid-term reliability needs, the vast majority of which are required to be zero carbon, and the majority of available zero carbon resources eligible to bid are solar + storage hybrids.[5] In that circumstance, it is critical that the D.20-06-031 methodology be as accurate as possible. The broader discussion of market integration of hybrid resources can wait for the next phase of RA reform for any change to capacity valuation, guidance from other venues through the active FERC proceeding, and, hopefully, actual operating experience from newly procured resources in the IRP mid-term reliability procurement.

The principles involved in the D.20-06-031 QC methodology provide a consistent, if conservative, capacity valuation[6] for alternating current (AC) coupled hybrids where the renewable resource (solar being the dominant technology) and the storage device being charged by that renewable resource (li ion batteries being the dominant technology) each have their own DC/AC inverter and are separately metered with revenue quality even if dispatched to the California Independent System Operator (CAISO) market as a single resource at the Point of Interconnection. The production profile measured in MWh/MW calculated from the CAISO settlement data accurately represents the appropriate AC MW rating of a least common

[4] Proposed Decision, at p. 3.
[5] R20-05-003 (IRP): Proposed Decision (May 21, 2021), at p. 2; Alternate Proposed Decision (May 21, 2021), at p. 2.
[6] The methodology does not assign any of the well documented "diversity benefit" to the hybrid and assumes a class average insolation and the production profile used includes energy curtailment whether from transmission congestion or market balance.

denominator average renewable resource inverter. It will serve its purpose for near term procurement.

However, for DC coupled hybrids where the renewable resource and the storage device share a single inverter and are not separately metered with revenue quality, the methodology systematically understates the energy available to charge the storage device. All solar installations whether stand-alone, co-located or hybrid have a higher DC rating than the inverter Pmax, and are thus capable of producing more energy than the inverter can convert to AC when the insolation is high and the array is producing at or near Pmax. This energy is called "clipped energy." It is not metered and does not appear in CAISO settlement data. It is however available for storage recharge through the DC coupling. The quantity of this clipped energy can be calculated simply by using the "MW" in the MWh/MW production profile as the solar DC Pmax which is an unambiguous, intrinsic, publicly available value.

If the hybrid is DC coupled, this clipped energy, which always occurs near solar noon and can be accurately predicted in advance, can be routed to the storage device for dispatch later in the day after the solar production falls with sunset. It results in a slightly higher QC calculation, but, most importantly, it does not penalize a developer for using the preferred configuration of DC coupling which is less expensive and more efficient. This proposal was the subject of workshops times over the last year with calculations of the impact on resource QC values presented without dispute from any party. The only objection from any party is that stated in the Proposed Decision as:

> "While there is merit to CEERT's proposal, we agree with Calpine that it is unclear whether all clipped energy is eliminated in a DC coupled system as it would depend on how the hybrid operates. In addition, it does not appear that information on whether a hybrid is DC or AC coupled is as readily available as

> CEERT claims. Unless this information is added to the CAISO Master File or other readily accessible data source, it would be difficult to implement."[7]

In fact, the coupling arrangement is clearly stated in the Interconnection package submitted for study to the CAISO, can be represented as a simple flag in the Master File, and can be readily verified by a simple drive by inspection. As to Calpine's comment that "it depends on how the hybrid operates," the same could be said of any resource of any technology on the system. That is the function of market monitoring. If the project was installed with too large a solar array or too small a battery to absorb all of the clipped energy, that fact would be automatically picked up in the D.20-06-031 methodology.

As such, there is no barrier to the Commission adopting CEERT's meritorious proposal now. To do otherwise continues to wrongly understate the value of DC-coupled hybrid resources.

II.
CONCLUSION

CEERT asks that the Proposed Decision be modified for the reasons stated above. Those needed modifications to the Proposed Decision are included in Appendix A (Proposed Modifications to Findings of Fact, Conclusion of Law, and Ordering Paragraph), which is attached and incorporated by reference hereto.

Respectfully submitted,

June 10, 2021

/s/ MEGAN M. MYERS

Megan M. Myers
Attorney for CEERT

110 Oxford Street
San Francisco, CA 94134
Telephone: (415) 994-1616
E-mail: meganmmyers@yahoo.com

[7] Proposed Decision, at p. 49.

APPENDIX A

CENTER FOR ENERGY EFFICIENCY AND RENEWABLE TECHNOLOGIES PROPOSED FINDINGS OF FACT, CONCLUSIONS OF LAW, AND ORDERING PARAGRAPHS FOR THE PROPOSED DECISION ADOPTING LOCAL CAPACITY OBLIGATIONS FOR 2022-2024, ADOPTING FLEXIBLE CAPACITY OBLIGATIONS FOR 2022, AND REFINING THE RESOURCE ADEQUACY PROGRAM

Center for Energy Efficiency and Renewable Technologies (CEERT) proposes the following modifications to the Findings of Fact, Conclusions of Law, and Ordering Paragraphs in the Proposed Decision Adopting Local Capacity Obligations for 2022-2024, Adopting Flexible Capacity Obligations for 2022, and Refining the Resource Adequacy Program, mailed in R.19-11-009 on May 21, 2021 (Proposed Decision).

Please note the following:

- A page citation to the Proposed Decision is provided in brackets for each Finding of Fact, Conclusion of Law, or Ordering Paragraphs for which a modification is proposed.
- Added language is indicated by **bold type**; removed language is indicated by **bold strike-through**.
- A new or added Finding of Fact, Conclusion of Law, or Ordering Paragraph is labeled as "**NEW**" in **bold underscored** capital letters.

PROPOSED FINDINGS OF FACT

"NEW" The Energy Division proposed a methodology to implement D.20-06-031 for calculating the QC of hybrid resources that requires an assessment of the energy available to charge the storage component of the hybrid from the renewable resource, and derates the QC of that resource if insufficient energy is available to ensure full dispatch of the storage during net peak hours.

(a.) That methodology did not distinguish between DC coupled and AC coupled hybrids.

(b.) The energy available for charging the storage component from an identical associated renewable resource is different if the hybrid is AC or DC coupled. This difference is easily and transparently available from public data.

(c.) The Energy Division proposal is to use three years of CAISO market settlement data to create an hourly production profile for the 20 hours/day outside the two hours before and after the net load peak hour for each month for the renewable energy available to charge the storage component. The MWH of energy required to fully charge the storage component is subtracted from this production profile and the remaining energy is converted back to MW when applying ELCC to the renewable resource QC.

PROPOSED CONCLUSIONS OF LAW

"NEW" Implementation of D.20-06-031 for calculating the QC of a hybrid resource should recognize the difference between DC and AC coupled hybrids. The production profile scaled to the DC rating of the renewable resource component should be used for DC coupled hybrids, and the same production profile scaled to the AC rating of the renewable resource inverter should be used for AC coupled hybrids.

PROPOSED ORDERING PARAGRAPHS

"NEW" When implementing D.20-06-031 for calculating the QC of hybrid resources, the proposed Energy Division methodology shall be used except that the production profile used to calculate available charging energy shall be scaled to the DC rating of the renewable resource for DC coupled hybrids and scaled to the AC rating of the renewable resource inverter for AC coupled hybrids.