BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Oversee the)
Resource Adequacy Program, Consider) Rulemaking 11-10-023
Program Refinements, and Establish Annual) (Filed October 20, 2011)
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COMMENTS OF THE CALIFORNIA WIND ENERGY ASSOCIATION ON THE PROPOSED DECISION ADOPTING LOCAL PROCUREMENT AND FLEXIBLE CAPACITY OBLIGATIONS FOR 2015, AND FURTHER REFINING THE RESOURCE ADEQUACY PROGRAM

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Pursuant to the Proposed Decision of Administrative Law Judge Gamson Adopting Local Procurement and Flexible Capacity Obligations for 2015, and Further Refining the Resource Adequacy Program ("Proposed Decision" or "PD") issued in this proceeding on May 27, 2014, and in accordance with Rule 14.3 of the Commission's Rules of Practices and Procedure, the California Wind Energy Association ("CalWEA") respectfully presents its comments on the Proposed Decision.

We focus on two issues of substantial concern: (1) the Proposed Decision's plan to use load-ratio share to allocate flexibility needs among load-serving entities ("LSEs"), which will reduce utilities' incentive to procure resources with lower integration costs; and (2) the Proposed Decision's plan to continue to use outdated and inaccurate Resource Adequacy ("RA") values for wind and solar, despite a three-year-old legislative directive and the availability of more accurate values that have been and will be used in other Commission proceedings. Both proposals would seriously harm the efficiency of the competitive resource procurement process, and would fail to encourage procurement of least-total-cost renewable energy resources. As pertains more directly to this RA proceeding, continuing to use outdated values will over-estimate the availability of RA capacity and could readily lead to system reliability problems and/or lead to expensive and duplicative backstop procurement. We address these issues below.

I. The PD Errs in Allocating Flexible Capacity Needs Based on Load-Ratio Share; Instead, the CAISO's Cost-Causation-Based Methodology Should Be Used To Encourage Least-Total-Cost Renewables Procurement

With almost no explanation, and after noting that "most parties favor an allocation based on [cost] causation in the future," the Proposed Decision concludes that, for "the 2015 RA year, we will use load-ratio share to allocate flexibility among LSEs, as this is a practical interim solution while alternatives are considered." PD at 19-20. If the Commission allocates flexible capacity needs on a load-ratio-share basis, however, the Commission will substantially mute the incentive for an LSE to procure resources with low flexible capacity costs, because these flexible capacity costs will be spread equally among all LSEs rather than charged to the LSE that causes the need for flexible capacity. To send real price signals to the utilities, which will encourage them to purchase the lowest total cost resources (including flexible capacity costs), the Commission should allocate flexible capacity costs based on cost causation principles.

Under the methodology developed by the CAISO as part of a lengthy CAISO stakeholder process (the results of which were reported to the Commission in the CAISO's May 1, 2014, Flexible Capacity Needs Assessment Report in this proceeding), CAISO calculated the allocation of flexible capacity needs to each individual CPUC-jurisdictional LSE based specifically on the factors that trigger the need to procure flexible capacity. However, CAISO included in its report only the total flexible capacity allocated to the Commission's jurisdictional LSEs as a whole. Given that CAISO has already calculated the contribution of the individual LSEs to the flexible capacity need, the allocation task by the Commission will be very straightforward.

While the PD states an intention to "explore other methods of allocation based on causation" in the future (PD at 20), the CAISO's well-considered and rational allocation methodology provides a far more accurate assessment of causation than one based arbitrarily on load-ratio-share, and thus serves as a more practical interim solution than does the load-ratio-share methodology. Therefore, the CPUC should adopt the CAISO approach as it considers other potential cost-causation methods.

II. The PD Errs in Continuing the Use of Outdated and Inaccurate Qualifying Capacity Values for Wind and Solar Resources; Instead, ELCC Values Used in Other Commission Proceedings Should Be Applied

As the Proposed Decision notes (at page 58), the Commission was ordered in Senate Bill 2 (1X) to determine the effective load carrying capacity (ELCC) of wind and solar energy resources on the California grid and to use those values in establishing the contribution of wind and solar energy resources toward meeting resource adequacy requirements. That legislation was signed into law more than three years ago. As explained below, the current "exceedance" methodology, which the Proposed Decision would continue to use for 2015 wind and solar Net Qualifying Capacity ("NQC") values, produces values that are outdated and grossly inaccurate. Meanwhile, the Commission has used ELCC values in several other proceedings (noted below). Rather than continuing to use an inaccurate non-ELCC methodology while the Energy Division refines its own ELCC methodology, the Commission should direct Energy Division to immediately identify ELCC-based wind and solar values from its available or readily obtainable sources of ELCC data for application in the 2015 RA cycle, while it refines its own ELCC methodology. The difference between the exceedance values and available ELCC values is certain to be far greater than the difference between currently available ELCC values and the Energy Division's refined ELCC values.

The choice of methodology, and associated values, has very important practical implications for fairly evaluating competing technologies and limiting overall RPS procurement costs to ratepayers, as explained below. Three years after the Legislature's directive, it is past time to employ the more accurate ELCC wind and solar capacity values.

A. The PD Misstates CalWEA's Position as in Support of Delay

The PD states that CalWEA and other parties "request that implementation be delayed by one year to allow parties to see the probabilistic modeling results, iterate with CPUC staff on the ELCC modeling, and further consider its implications prior to adoption of an ELCC calculation methodology or ELCC-based QC values." PD at 59. CalWEA never took such a position; in fact, CalWEA opposes such a delay. The PD should be corrected accordingly.

B. Capacity Values Can Decline Significantly with Technology Penetration, a Phenomenon Not Captured by the Current Exceedance Method

It is generally understood that the capacity value of any fixed-profile resource declines with increased penetration. This is true for wind energy, but the phenomenon is pronounced with solar resources due to the concentration of its production during certain, relatively limited, hours of the year.[1] Several studies, including 2012 and 2014 studies by Lawrence Berkeley National Laboratory[2,3] ("LBNL"), a 2014 study by Energy and Environmental Economics, Inc. performed for California's five major utilities ("E3 Five-Utility Study"),[4] and others,[5] confirm the phenomenon.

The graphic below, from the 2014 LBNL study, illustrates the diminishing value of adding large penetrations of a single resource, as well as how the relative value of resources can change as penetration increases on an energy basis. As shown, the value of solar diminishes steeply, even at low penetrations. With about 4,500 MW of solar resources operating on the CAISO system by 2015, California will be at approximately 4% solar penetration on an energy basis. With about 8,000 MW of solar resources operating on the CAISO system by 2020, California will be at approximately 7% solar penetration on an energy basis.[6] (These figures do not include behind-the-meter solar, which would significantly raise these figures.) A 2012 study[7] by E3 for the CAISO indicates that, at the 8,000 MW penetration level under a projected 2020

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[1] As a simple demonstration of this, the difference between the peak load during daylight hours and the peak load during nighttime hours should serve as a rough cap on the cumulative capacity value of solar.

[2] Andrew Mills and Ryan Wiser, *Changes in the Economic Value of Variable Generation at High Penetration Levels: Pilot Case Study of California*, LBNL (June 2012). Available at: http://eetd.lbl.gov/EA/EMP.

[3] Andrew Mills and Ryan Wiser, *Strategies for Mitigating the Reduction in Economic Value of Variable Generation with Increasing Penetration Levels*. LBNL. (March 2014) Available at http://emp.lbl.gov/sites/all/files/lbnl-6590e.pdf.

[4] *Investigating a Higher Renewables Portfolio Standard in California*, Energy and Environmental Economics, Inc. (January 2014). Available at http://www.ethree.com/public_projects/renewables_portfolio_standard.php.

[5] *See, e.g.,* J. Jorgenson, P. Denholm, and M. Mehos, *Estimating the Value of Utility-Scale Solar Technologies in California Under a 40% Renewable Portfolio Standard.* NREL. (May 2014.) Available at: http://www.nrel.gov/docs/fy14osti/61685.pdf.

[6] Based on the CPUC's RPS Projects Status Table (http://www.cpuc.ca.gov/PUC/energy/Renewables/); California Energy Commission, *California Energy Demand 2010-2020 Adopted Forecast* at Table 5 (available at http://www.energy.ca.gov/2009publications/CEC-200-2009-012/CEC-200-2009-012-CMF.PDF); "2013 Annual Report on Market Issues and Performance" CAISO (April 2014); and assuming 25% solar capacity factor.

[7] E3, "Needs Modeling Summary" (Presentation to the CAISO) (May 7, 2012).

resource mix, the average solar ELCC value would be approximately 30% (as shown in the graphic below), as compared to compliance-year 2014 NQC (exceedance) values in excess of 80% of nameplate capacity during summer months.[8] (Although E3's ELCC value is an annual figure, it represents the capacity contribution of a resource over all the hours in the year where the loss of load probability (LOLP) is meaningfully different from zero. For California, the highest LOLPs are concentrated during the summer months, so it is reasonable to compare the annual ELCC figure to the summer NQC values.)

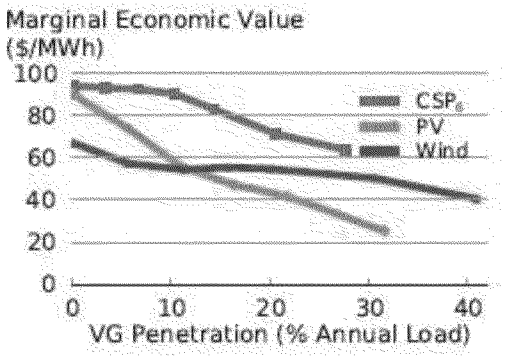


Figure 1: Marginal economic value of wind, PV, and CSP with thermal storage found in the Reference scenario of the valuation report.

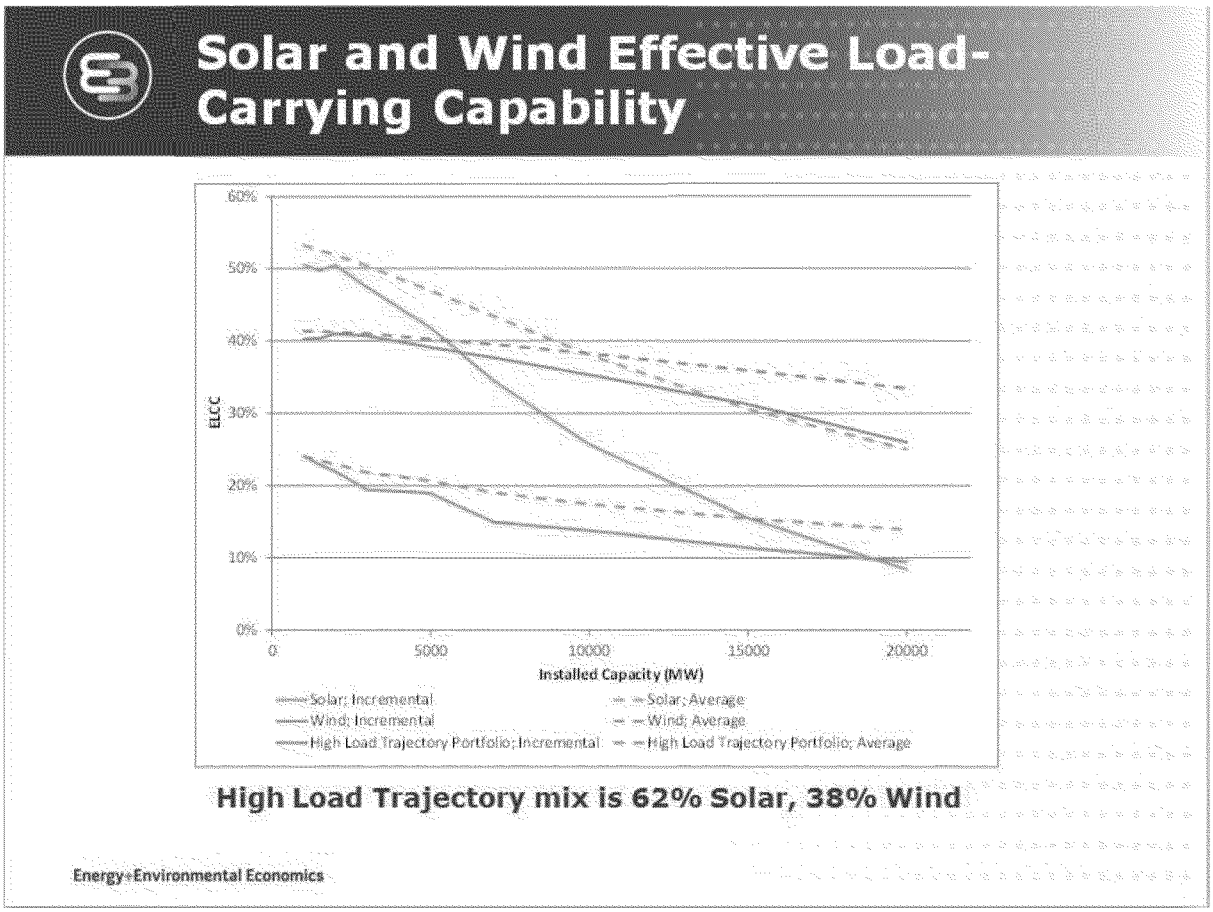
Source: LBNL, 2014.

While these NQC and ELCC values are not perfectly comparable, they are indicative of the dramatic difference between ELCC values for solar resources – which capture the phenomenon of declining capacity value with penetration – and the exceedance methodology, which does not. The exceedance methodology has never, to CalWEA's knowledge, been benchmarked to ELCC results. The North American Electric Reliability Corporation (NERC) has recommended such benchmarking to rigorous ELCC studies, if control area operators use

[8] The current methodology is described beginning at the bottom of p. 15 at http://www.cpuc.ca.gov/NR/rdonlyres/2526B26C-BEEA-46FE-904F-A99D2F042FD8/0/AdoptedQCmethodologymanualfromD1006036APPENDIXB.doc. The default values for 2014 are posted here: http://www.cpuc.ca.gov/NR/rdonlyres/C334EAC0-2090-41B3-884C-F115076C60FC/0/2014TechnologyFactors.xls.

such "shorthand" methods for setting the capacity value of intermittent resources.[9] Moreover, an NREL study of capacity valuation methods discounts exceedance-type approaches as "based on fallacious use of probability theory."[10]

Because exceedance-based NQCs fail to accurately reflect the declining value of resources as their penetration increases, continuing to use exceedance-based NQC values will over-estimate the availability of RA capacity at any time, which could readily lead to system reliability problems and/or lead to expensive backstop procurement.



Source: E3, 2012.

[9] NERC Integration of Variable Generation Task Force, "Accommodating High Levels of Variable Generation" (April 2009), at 36-42. This report is available on the NERC website at http://www.nerc.com/files/IVGTF_Report_041609.pdf.

[10] M. Milligan and K. Porter, *Determining the Capacity Value of Wind: A Survey of Methods and Implementation,* National Renewable Energy Laboratory. (at p. 20). Available at: http://www.nerc.com/docs/pc/ivgtf/milligan_porter_capacity_paper_2005.pdf

C. Accurate NQC Values Represent an Important Cost Signal in Reducing the Total Cost of Renewable Energy

The E3 Five-Utility Study and CalWEA's analysis of that study[11] both emphasize the importance of a carefully balanced renewable energy mix in reducing the total overall cost of renewable energy, including grid-integration costs. While studies of the type conducted by E3 for the utilities will be important for long-term planning, accurate capacity values are an essential cost-signal along the way to steer utilities towards that appropriately balanced, least-total-cost path. RA values that remain artificially high for solar resources will over-value capacity during summer midday periods relative to delivery during other times, which effectively under-values the relative capacity value of baseload, intermittent baseload, and flexible resources. The result is to continue to pay too much for capacity during summer midday periods when it is needed less and less.

The utilities typically use the current RA counting values for evaluation of their long-term and RPS procurements.[12] Thus, the failure to update RA values based on more accurate and accepted methodologies will impose inaccurate cost signals in procurement decisions, leading to higher overall ratepayer costs. It is also unfair to bidders to inaccurately assess the value of their projects.[13] In light of significantly changing capacity values with technology penetration, it is critically important for the IOUs to use updated capacity and energy values that reflect the procurement that has already occurred, both for fairness to bidders and to reduce total costs associated with the RPS as required by statute. For this to happen in the 2015 RPS procurement cycle, the RA NQC values for wind and solar must be updated.

D. The Commission Has Used and Is Using ELCC Values in Other Proceedings

While the Energy Division RA staff has not yet finished its process of modeling and adopting ELCC values using the SERVM model in this proceeding, Energy Division and the Commission have used and continue to use ELCC values developed with a different modeling

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[11] "Investigating the Investigation of a Higher Renewables Portfolio Standard in California: A Review of the Five-Utility E3 Study," CalWEA (April 2014). Available at: http://bit.ly/1kwt7YS.

[12] *See, e.g.,* Southern California Edison Company's (U-338-E) 2014 Renewables Portfolio Standard Procurement Plan, Volume 2 (June 4, 2014), at p. 517.

[13] Even if 2015 RA values remain based on the exceedance approach, the Commission should require the utilities to use updated ELCC values in their RPS procurement plan governing bid evaluations.

tool by E3 in other proceedings.[14] ELCC is an established methodology, and the E3 model (first developed for the CAISO and adapted for use at the CPUC) uses standard techniques.

While the final values that Energy Division calculates using the SERVM model can be expected to differ somewhat from the E3 values, there is no reason to expect this difference to be significant. Certainly the E3 values can be expected to be much closer to the values that will be produced with the SERVM model than to the exceedence-based values, as described above. Thus, they can be expected to be far more accurate than the exceedance-based values.

Energy Division RPS staff is expected to release very soon an updated RPS Calculator, developed by E3, that will include a matrix of resource-specific ELCC values reflecting various penetration levels of both wind and solar, combined. CalWEA understands that this matrix will enable 2015 annual ELCC values to be estimated for each resource type, based on 2015 resource-specific penetration levels. Translating these annual ELCC values to monthly values using the E3 tool should be a relatively simple exercise, particularly if the figures are provisional and temporary while we await values from the SERVM model.

Developing and using these readily available ELCC values while Energy Division's RA staff continues to refine its ELCC values based on the SERVM model will be far more accurate than continuing to use exceedance-based values that are known to be outdated and wrong -- and contrary to statute. The PD has used similar reasoning in adopting the CAISO's revised proposal for seasonal flexible categories, stating that it "strikes a balance between reliability, administrative ease, and accurate levels of procurement." (PD at 21.) Likewise, the Commission should direct Energy Division to develop ELCC-based NQC values for wind and solar for the 2015 RA year because this is a practical solution that will produce more accurate values than continuing to use incorrect figures.

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[14] *See, e.g.,* CPUC, "California Net Energy Metering Ratepayer Impacts Evaluation" (October 2013). The CPUC has also used E3's RECAP ELCC values in calculating the potential for local distributed PV installations (see http://www.cpuc.ca.gov/NR/rdonlyres/5F2B76C0-043D-46CA-8C41-1F67E3116999/0/Jan31_CPUC_RenewableDGTechnicalPotentialWorkshopSlides.pdf). The Energy Commission has used these values to develop its time-dependent valuation factors for its building standards (see http://www.energy.ca.gov/title24/2016standards/prerulemaking/documents/2014-04-29_workshop/presentations/Brian_Horii-Eric_Cutter_2017_TDV_Updates.pdf).

III. CONCLUSION

For the foregoing reasons, the Commission should use a cost-causation-based methodology to allocate flexible capacity needs to LSEs in 2015 and should determine qualifying capacity values for wind and solar resources for 2015 using the ELCC methodology developed for the Commission for use in other Commission proceedings.

Respectfully submitted,

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APPENDIX A

PROPOSED FINDINGS OF FACT, CONCLUSIONS OF LAW, AND ORDERING PARAGRAPHS

Proposed Changes to Findings of Fact:

14. In the RA program, system capacity is allocated to Load Serving Entities using the ~~load-ratio share method~~ methodology described by the CAISO in its May 1, 2014, Flexible Capacity Needs Assessment Report in this proceeding.

Proposed Changes to Conclusions of Law:

6. Flexible capacity should be allocated to Load Serving Entities using the ~~load-ratio share method in~~ methodology described by the CAISO in its May 1, 2014, Flexible Capacity Needs Assessment Report in this proceeding for 2015, but should be reconsidered for future RA years.

Proposed Changes to Ordering Paragraphs:

14. Qualifying capacity values for wind and solar resources shall be determined for 2015 ~~according to the exceedance methodology adopted in Decision 09-06-028~~ using the ELCC methodology developed for the Commission for use in other Commission proceedings.