

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking to Integrate and)
Refine Procurement Policies and Consider) R. 10-05-006
Long-Term Procurement Plans)
_____)

**REPLY COMMENTS
OF THE
CALIFORNIA WIND ENERGY ASSOCIATION
ON THE OCTOBER 22 CPUC WORKSHOP ON CAISO AND PG&E
RENEWABLE INTEGRATION MODELING METHODOLOGIES AND RESULTS**

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On behalf of
CALIFORNIA WIND ENERGY ASSOCIATION

November 22, 2010

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The California Wind Energy Association (CalWEA) respectfully provides the following brief reply comments in response to the questions posed in the attachment to the November 10, 2010, electronic communication of Administrative Law Judge (ALJ) Kolakowski on the CAISO’s and PG&E’s proposed methodologies for modeling the integration of renewable energy generation into California’s electricity system.

CalWEA would like to again acknowledge the substantial effort that the CAISO and PG&E have invested in modeling the potential changes in operational requirements of the California electric system once renewable energy generation provides 33% of the state’s electricity energy needs in 2020. This effort has been beneficial mostly in demonstrating the limits of the current analytic tools for analyzing renewables integration issues and in identifying the many questions that need to be answered before the Commission can act with confidence toward ensuring that the state has the resources necessary to efficiently integrate 33% renewables. Hence, CalWEA repeats its earlier principal recommendation that the Commission should focus on a “least regrets” set of actions that must be undertaken now, in the face of substantial uncertainty on this issue, in order to avoid investing in resources that may prove to be

unnecessary.¹

Following are our specific responses to the ALJ's questions:

I. PG&E Renewable Integration Model

A) PG&E Step 2 Inputs, Assumptions, and Methodologies

1. Please comment on the key inputs, assumptions and methodologies used in the Step 2 portion of the PG&E model, including those listed below.

CalWEA disagrees with PG&E's "Step 2" approach that translates the flexibility requirement into actual system resource capacity needs. In its "Step 2" approach, PG&E assumes that the load-following requirement is a capacity requirement that should be kept in reserve, on top of the capacity that is used to meet the demand, at all times. In other words, based on PG&E's paradigm, the load-following capacity requirement should be treated the same way as, and added to, the other system reliability reserves (i.e., spin, non-spin and regulation capacity reserves) that must be set aside at all times for maintaining system reliability needed under unpredictable operating conditions.

In practice, however, load-following capacity is NOT a set-aside and is used every five minutes to deal with predictable system needs, mainly forecasted variations in load. Hence, modeling the load-following capacity requirement as fixed set-aside capacity to be used in an hourly annual production simulation process to determine system capacity needs (as approximated by PG&E) is incorrect and could lead to a severe overestimation of the load-following capacity requirement. Instead, system resources needed to provide load-following

¹ In this regard our ideas are by and large in line with those of SCE as stated in its previous set of comments. SCE's idea of a "least regrets" policy is that procurement choices related to renewables integration should be made over a number of LTPP cycles, in a manner that retains flexibility, and does not compromise either reliability or RPS compliance. Similarly, the CAISO's comments call for the Commission to focus on developing the tools to analyze integration issues and to adopt only "the minimum measures that must be taken now to allow for the process to mature and evolve" over the next decade.

capability can only be determined as part of the same five-minute dispatch simulation process that is used to determine the load-following requirement itself. In other words, system resource capacity needed for the load-following requirement should be calculated simultaneously with the load-following requirement itself as part of the five-minute dispatch simulation process and not separately as part of an annual production simulation process.

For this reason, PG&E's approach for determining system resource needs is unrealistic and unsuitable for calculating accurately the system resources capacity needed for load following purposes. We, therefore, do not address many of the questions relating to the finer points of PG&E's methodology.

2. If you have concerns about data inputs used for any of the above topics, please answer the following specific questions:

a. What alternative data is currently publicly available?

b. Would using this alternative data have a *material* impact on the model's results? Please explain.

PG&E should evaluate its counter-intuitive Net Qualifying Capacity (NQC) calculations from the perspectives of both data and methodology, especially since the CAISO also relies on PG&E's NQC calculation in its evaluation of system resource capacity requirements. CalWEA has provided PG&E and the CAISO with extensive feedback on this issue, including CalWEA's own NQC calculations using NREL data for new wind resources in California. CalWEA has not received any feedback from PG&E or the CAISO on this issue. CalWEA continues to be willing to work closely with PG&E, the CAISO, and the CPUC Energy Division to develop an accurate calculation of the NQCs for new wind resources in California and to correct the NQC results calculated by PG&E. Using accurate NQC figures will produce more accurate estimates of needed system resource capacity both for PRM needs and system flexibility needs.

3. Is PG&E's model a valuable tool for estimating the relative difference in resource requirements and/or costs between various renewables scenarios? Please discuss in what precise ways the model should or should not be used for this purpose.

This is one area where PG&E's model, due to its simplicity, could potentially and very cautiously be used as a screening tool for aggregate results only. Otherwise, CalWEA does not endorse PG&E's model for use in estimating any specific values for use in the LTPP analyses.

II. Comments on CAISO Step 1-Related Information Provided After the August 24-25 Workshop

We find CAISO's Step 1 approach for determining system flexibility requirements, i.e., the regulation and load-following capacity requirements, to be rigorous and based on the simulation of the process that is actually used for dispatching regulation and load following capacities. However, despite the rigor of the CAISO's Step 1 approach, we find some of the assumptions used to be overly conservative. We have attached the comments that we submitted to the CAISO on its 20% RPS integration study, which also address our concerns here.

As noted above, while we find the CAISO's Step 1 approach to be generally acceptable, we disagree with its Step 2 approach for determining system resource capacity needs. In that approach, the CAISO, like PG&E, treats load-following requirements as a capacity reserve that should be set aside above and beyond the capacity that is needed to meet the demand in exactly the same way that reliability-based reserves, such as spin and non-spin reserves, are set aside. This approach is incorrect, as load-following capacity is used to follow forecasted load variations on a five-minute basis, not set aside to address system reliability concerns. This fact invalidates the use of the current annual hourly production simulation analysis to determine system resources needed for meeting the load following requirement; this approach will over-estimate the need for system resource capacity.

Instead, the CAISO should calculate the system resource capacity requirements for meeting load following needs using the same Step 1 process used to determine the load-following requirement itself – i.e., as part of the same stochastic five-minute simulation analysis that CAISO currently uses for calculating the system flexibility needs. If the CAISO insists on using a separate simulation run for determining system resource capacity needs, it should then transfer the regulation and load following requirements on a five-minute basis from Step 1 to Step 2 and then run five-minute interval production simulation runs for a few critical days or weeks of the study year. Limiting the five-minute interval production simulation analysis to a few days or weeks in a year should help to keep these studies manageable. Hence, the plan that CAISO presented in the last CPUC LTPP workshop on October 22, 2010, in which it would use hourly load following capacity requirements in an annual hourly production simulation analysis, while a definite improvement on its past approach of using “maximum” hourly load-following requirements across all like-hours of a season, will not be appropriate for determining system resource capacity needs.

Respectfully submitted,

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On behalf of
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November 22, 2010

ATTACHMENT

**COMMENTS OF THE CALIFORNIA WIND ENERGY ASSOCIATION
ON CAISO INTEGRATION OF RENEWABLE RESOURCES –
OPERATIONAL REQUIREMENTS AND GENERATION FLEET CAPABILITY
AT 20% RPS**

Darius Shirmohammadi
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October 20, 2010

I. Introduction & Summary

The California Wind Energy Association (CalWEA) appreciates the opportunity to comment on the CAISO's August 31, 2010, report, Integration of Renewable Resources – Operational Requirements and Generation Fleet Capability at 20% RPS ("20% RPS Report").

Before presenting our specific comments, we would like to applaud CAISO for taking on and completing this massive undertaking. Although we were somewhat disappointed in the stakeholder process that the CAISO conducted around this study, we are impressed by the efforts that the CAISO expended to perform its study in a technically systematic and professional manner.

We find the main conclusion of the paper – that the flexibility in the CAISO's current system can readily handle the 20% renewables scenario – to have been rigorously developed under very conservative assumptions and to be consistent with common sense. If the points that we raise in these comments are accounted for, we believe it will become clear that the flexibility inherent in the current system can accommodate substantially more than the 20% renewables penetration. Most importantly, however, the CAISO's conclusion tells us that we have some time to "get it right" for the 33% RPS and that there is no need to rush into costly system integration measures in the near term.

Finally, we fully support the main recommendations in the 20% RPS Report:

- The CAISO should pursue incentives or other mechanisms to reduce the level of self-scheduled resources and/or increase the operating flexibility of otherwise dispatchable resources.
- The CAISO should explore market rules and incentives to encourage greater participation by wind and solar resources in economic dispatch.

- The CAISO should improve day-ahead and real-time forecasting of operational needs and develop a regulation prediction tool and a ramp/load-following requirement prediction tool.

II. Specific Comments

Our specific comments are mostly related to the underlying assumptions and some elements of the methodologies used by the CAISO in performing its studies and drawing its conclusions.

1. In the 20% RPS Report, CAISO states that the potential overgeneration conditions “can be covered by the procured regulation down or allowed to result in an Area Control Error (ACE) violation.” (20% RPS Report at p. x and at p.78) It is not clear why the CAISO presumes that potential overgeneration conditions that can reasonably be predicted in the Day-Ahead and Hours-Ahead timeframes should be mitigated using the system regulation capability rather than with system load-following capability. This is an important distinction as system load following is by and large provided by all RA resources that are committed and operating as opposed to regulation sources that need to be committed on top of RA resources at additional expense. In contrast to this presumption, the report states (at p. xiii and p. 75): “overgeneration was found to be directly correlated to the amount of nondispatchable generation in the system. There appears to be sufficient dispatchable generation available to operate if the ISO is not prevented from doing so due to an excess of non-dispatchable generation, including imports.” This statement indicates that the potential overgeneration problem should and could be managed using the load-following capability of the system using the 5-minute dispatch process of the Real-Time market. If the problem is due to “excessive” self scheduling of system resources such that there is insufficient load-following capability left in the system, we recommend that the CAISO take proper measures including lowering its economic bid floor so that system resources are encouraged to voluntarily offer decremental economic bids. If this or other measures do not bring the needed system flexibility, the CAISO should be prepared to require RA resources to submit economic bids equal to their RA capacity value.

2. The 20% RPS Report seems to suggest that the maximum regulation requirements apply to those hours where load net of renewable generation is predictably ramping rapidly up or down (“the highest regulation up requirements are typically in the morning and evening wind and solar ramp periods, while regulation down requirements are concentrated in the mid-afternoon hours” - p. xi) as opposed to during times when the system needs to deal with unpredictable and fast variation of load and renewable generation. Here again, the predictability of such ramp conditions should allow CAISO to use the system’s load-following capability, and implies that the CAISO should enhance its various market mechanisms to increase the availability of the system’s inherent capabilities rather than rely on regulation resources.

3. The 20% RPS Report (at p. xiii and p. 65) indicates that, in early 2009, when renewables penetration was well below 10%, “the ISO regulation markets have procured levels of regulation up and regulation down since April 1, 2009, in the range of 600-700 MW in each hour of the operating day,” mainly due to caution related to the

start of the MRTU market. As a point of reference, it would be useful to know what the CAISO had forecasted as needed during these hours. We understand that the level of regulation procurement in the CAISO market has declined from these high levels. Having this information may facilitate more accurate predictions for the 33% RPS study.

4. The 20% RPS Report states (at p. xiv) that “in an hourly simulation of 2012, combined cycle generator starts increase by 35 percent compared to a reference 2012 case that assumes no new renewable capacity additions beyond 2006 levels.” Developing a 2012 reference case by extrapolating a 2006 renewable generation case would inevitably show a more dramatic increase in combined cycle generator starts due to a smaller penetration of renewables in 2006. Extrapolating from the 2009 case to build the 2012 reference case seems more appropriate given the goal of this effort and is expected to show a more modest increase in combined cycle generator starts from a recent year in which renewables were successfully integrated,.

5. The 20% RPS Report states that the introduction of renewables is expected to reduce locational marginal cost/prices, perhaps at times dramatically. However, it is not clear to us that overall gas generation revenues will also decline dramatically. First, we expect that the capacity revenue for gas generators would increase as the value of A/S capacity rises. Second, to the extent that these generators have signed long-term PPAs, their revenue stream would not be unreasonably impacted due to the drop in locational marginal costs/prices.

6. The 20% RPS Report states that a significant portion of system integration requirements is driven by the system uncertainty (various forecast errors) and yet the CAISO still plans to procure all of its ancillary service requirements in the day-ahead integrated forward market (Report at p. 14). By procuring ancillary services a day in advance, the CAISO will end up procuring more ancillary services than is needed due to the larger forecast errors in the day-ahead timeframe. Instead, the CAISO should supplement its Day-Ahead (DA) integrated forward market and unit commitment process (RUC) with a number of Day-Of (DO) forward markets and unit commitment processes by 2012 to better manage system uncertainty and reduce the need for procuring additional system flexibility and other system resources to deal with such uncertainty. In the longer term, when much of the slow start generation resources are replaced with much faster start generating units, we foresee a very minor role, if any, for the DA market process.

7. The 20% RPS Report states (at p. 3) that short-term out-of-state renewables contracts “will generally be replaced by power purchase agreements with in-state renewable resources” and that “existing out-of-state resources may also seek dynamic transfer arrangements with the ISO.” The CAISO then concludes, “both of these circumstances will shift the integration requirements to the ISO.” As it is not clear what will replace these resources, especially given that RPS regulations are still in flux, and given the lack of firm transmission necessary for dynamic transfer arrangements, we suggest the word “may” rather than “will.” More importantly, given at least some longer-term “shaped and firmed” contracts from out-of-state resources, we find placing the system integration requirement for the entire 20% RPS on internal CAISO resources to overstate system flexibility requirements and to unnecessarily predict adverse system conditions such as overgeneration.

8. The 20% RPS Report states (at p. 16) that “load-following is not an ancillary service like regulation and is not explicitly procured by the ISO in its day-ahead and real-time markets; rather, it is a function of the generation committed and dispatched in the day-ahead to real-time market and operational sequence and is met as long as the optimization algorithms used in those processes are appropriately specified.” We completely agree with this factual statement regarding this attribute of the load-following service and are pleased to see it stated here. However, this statement contradicts the assumption in the fleet requirement analysis (Step 2 analysis) of the CAISO’s 33% RPS study where load-following is incorrectly treated as an ancillary service just like regulation which will lead to more integration fleet capacity requirements than warranted.

9. The 20% RPS Report states (at p. 18) that the CAISO considers all imports and hydro generation to be non-dispatchable. While assuming non-dispatchable imports is a reasonable simplifying measure, assuming hydro generation as non-dispatchable does not seem reasonable and will lead to over-estimation of system flexibility and associated fleet capacity requirements.

10. The 20% RPS Report states (at p. 43) that the CAISO considers that “all four nuclear units were modeled as a combined full output of 4,550 MW.” Given the important impact of these nuclear units in creating the overgeneration condition and the ease with which the maintenance schedule of these units (that are usually multiple months long and scheduled for off-peak periods) can be readily modeled in production simulation studies, we do not understand why the CAISO would made this unjustifiable simplifying assumption.

11. The 20% RPS Report states (at p. 43) that “the model did not represent ancillary service procurement requirements on a regional and sub-regional basis.” While we agree that importing regulation may be quite challenging, although it is done, we are concerned that the CAISO is assuming that contingency reserves, especially non-spinning reserve, cannot and will not be imported into its Balancing Area (BA). At the same time, the CAISO assumes elsewhere in the report (p. 3) that “existing out-of-state resources may also seek dynamic transfer arrangements with the ISO. Both of these circumstances will shift the integration requirements to the ISO.” These contradictory assumptions serve to magnify the integration requirements of the 20% RPS.

Again, and despite our concerns stated above, we would like to congratulate the CAISO for the impressive work performed in this study. While we do not advocate that the CAISO repeat its 20% RPS integration study by accounting for our comments and concerns, we do expect that these comments and concerns be seriously considered in the CAISO 33% RPS study that is currently underway.

CERTIFICATE OF SERVICE

I hereby certify that I have this day caused to be served a copy of the foregoing document, **Reply Comments of the California Wind Energy Association on the October 22 CPUC Workshop on CAISO and PG&E Renewable Integration Modeling Methodologies and Results**, by Electronic Mail where possible and First-Class Mail where not, on all known parties to R. 10-05-006, named on the service list attached to the original certificate of this document pursuant to the Commission's Rules of Practice and Procedure.

I declare under penalty of perjury that the foregoing is true and correct.

Executed at Berkeley, California, Tuesday, November 22, 2010.

/s/ Christa Goldblatt

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