

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

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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 make 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.