

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

Order Instituting Rulemaking to Integrate and Refine
Procurement Policies and Consider Long-Term
Procurement Plans.

Rulemaking 13-12-010
(Filed December 19, 2013)

**COMMENTS OF THE INDEPENDENT ENERGY
PRODUCERS ASSOCIATION ON THE CALIFORNIA
INDEPENDENT SYSTEM OPERATOR'S STUDY RESULTS**

INDEPENDENT ENERGY PRODUCERS
ASSOCIATION
Steven Kelly, Policy Director
1215 K Street, Suite 900
Sacramento, California 95814
Telephone: (916) 448-9499
Facsimile: (916) 448-0182
Email: steven@iepa.com

GOODIN, MACBRIDE,
SQUERI & DAY, LLP
Brian T. Cragg
505 Sansome Street, Suite 900
San Francisco, California 94111
Telephone: (415) 392-7900
Facsimile: (415) 398-4321
Email: bcragg@goodinmacbride.com

Attorneys for the Independent Energy Producers
Association

Dated: May 29, 2015

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Pursuant to the *Administrative Law Judge's Ruling Discontinuing Phase 1a and Setting Forth Issues for Phase 1b*, dated March 25, 2015, the Independent Energy Producers Association (IEP) submits these comments on the "Report of the No Renewable Curtailment Sensitivity Cases Study" submitted by the California Independent System Operator (CAISO) on May 8, 2015.

The CAISO's most recent modeling is a good step toward a better understanding of the potential range of system violations that result from attempting to operate the grid under the assumptions in the Trajectory Case and the 40% RPS cases as defined in this proceeding. The CAISO's initial testimony in this proceeding established one "bookend" of this range by assuming that renewable resources could be curtailed without limit. The CAISO's most-recent modeling provides an estimate of the other bookend, *i.e.*, no curtailment of renewable resources.

I. COMMENTS ON THE CAISO'S STUDY

In these comments, IEP makes three basic points about the use of the information developed by the CAISO's modeling studies in this proceeding. First, the modeling results

provided by CAISO do not present any estimate of the relative costs of the two curtailment bookends. To date, there has been scant analysis of the true economic cost of curtailing renewables and the impact of those curtailments on utility revenue requirements. This analysis is overdue. Second, additional modeling is needed to more fully understand the potential to mitigate “dump energy” conditions by exporting power to neighboring balancing authorities. While exporting to neighboring balancing authorities provides a meaningful tool for grid operators to manage the grid, some parties hold out this option as *the* solution for the forecasted overgeneration problems. This hypothesis needs to be tested. Third, while the CAISO’s modeling was based on assumptions that were adopted early in this proceeding, future modeling will need to reflect expected changes in loads that will likely occur as a result of proactive steps being proposed by the Commission, CAISO, and others to address the effect on the grid of increased proportions of renewable energy. These load changes could significantly reduce what otherwise would be treated as surplus “dump energy.” Modeling for the Long-Term Procurement Plan (LTPP) proceeding should focus greater attention on the impacts of policies and programs designed to take advantage of low-cost, low-greenhouse gas emitting energy that would otherwise result in overgeneration. IEP is also concerned about the continued use of renewable generation assumptions that do not comport with the Least Cost-Best Fit requirements for renewable procurement. IEP discusses each of these topics below.

A. The Need for Greater Understanding of Economic Impacts

In the modeling submitted to date, the CAISO has not estimated the economic costs associated with either bookend scenario. This omission is understandable, since the CAISO might not have access to data related to the buyers’ economic curtailment rights in the current portfolio of renewable power purchase agreements (PPAs). PPAs have a wide variety of

curtailment options ranging from no economic curtailment to unlimited economic curtailment with compensation to the generator.

In addition, the CAISO has used an assumed price of -\$300/MWh (the bid floor assumed to be in place in the CAISO's energy markets in 2024) as the "price" of curtailment in its modeling. As a result, the production costs derived from the CAISO modeling cannot be used to determine the effect on rates or to test the relative cost-effectiveness of different approaches for meeting flexible capacity requirements.

IEP recommends that the CAISO and the Commission should work together to develop more refined curtailment assumptions based on common commercial practices for use in the next LTPP proceeding. These activities should begin quickly because IEP expects that the CAISO/Commission process may be time-consuming, requiring the review of the economic curtailment provisions of renewable PPAs and translation of the PPA curtailment provisions into reasonable modeling assumptions. If the CAISO and Commission do not start these efforts soon, then the Commission will not have information available for inclusion in the Standard Planning Assumptions to be used in the next LTPP proceeding, which will mean that that proceeding will lack the same information that we lack today.

B. The CAISO Should Test its Assumptions Regarding Net Exports

IEP has watched with some concern the debate among parties about whether net exports can be used to mitigate overgeneration (or to reduce the need for curtailment of renewables). The CAISO made the modeling assumption that net exports will not be used to mitigate overgeneration. However, the CAISO's assumption of no net exports is just that: an assumption, and no modeling has tested this assumption. The lack of testing of this assumption to date is understandable because it was necessary for the CAISO and other parties to use a simplified representation of out-of-state loads and resources to improve runtimes for the

PLEXOS modeling. Because of this simplified representation, the modeling may not accurately indicate whether out-of-state balancing authorities could in fact accept excess generation at the time that it occurs on the CAISO system. Since overgeneration is associated with low or even negative market prices for energy, out-of-state purchasers would be eager to accept the excess generation if it can be exported from California. The impact of this single assumption could be very substantial: allowing for net exports could significantly reduce or even eliminate the need for renewable curtailment.

The CAISO and other parties should devote resources in the coming months to improving the PLEXOS modeling of loads and resources outside of California. With an improved representation, it would be possible to simulate a small number of scenarios to test whether it is likely that net exports of excess generation would provide an alternative to renewable curtailments. If this more-detailed modeling shows that there are not economic opportunities to export power during periods of overgeneration, then the CAISO's assumptions would be demonstrated to be reasonable and the CAISO could continue using its no net export assumption. However, if the more-detailed modeling shows that there are opportunities for beneficial net exports during periods of overgeneration, then the CAISO should develop simplified representations of those opportunities and use those with its less-detailed modeling of out-of-state loads and resources.

C. Better Assumptions Are Needed Regarding Loads and Future Renewable Additions

The CAISO's initial modeling predicts significant amounts of curtailment of renewable resources. Two main drivers for this result are (1) the hourly load forecast and (2) the assumed makeup of the future renewable fleet. These assumptions need to be more carefully scrutinized in future modeling efforts to reflect policy initiatives to reduce greenhouse gas

emissions, increase the use of renewable energy, and increase water supply through desalination and groundwater recharge. In particular, future modeling should ensure that the hourly load forecast used in the PLEXOS modeling reflects changes in load quantities and load shapes that would result from proactive steps taken by the Commission and other agencies to implement these policies. Examples of such steps, which would increase load during periods of excess supply, include:

- Development of targeted load-building programs, such as electrification of transportation, desalination, pumping for groundwater recharge, and other measures;
- Proposed changes in time-of-use periods or expanded use of real-time pricing, which would lower rates during periods of excess supply and encourage a shift of consumption to those periods;
- Expanding Demand Response programs to include customers that can *increase* load on short notice; and
- Development of storage facilities with higher energy densities, which would allow for storage of energy during low net load hours and for deliveries during higher load hours.¹

Over the next several months, the Commission and the California Energy Commission (CEC) should work together to develop hourly load forecasts that reflect the potential impacts of these programs. This work should be completed in time to be included in

¹ Specifically, storage should have adequate energy density to allow for several hours of discharge. Greater energy density would avoid the unexpected result seen in the CAISO's most recent modeling where storage was cycled multiple times in a single day to attempt to mitigate overgeneration.

the CEC's 2105 Integrated Energy Policy Report and the next set of Standard Planning Assumptions that would be used in the 2016 LTPP proceeding.

IEP is also concerned that the assumptions underlying forecasts of future renewable resource additions are not reasonable. The 2014 LTPP Trajectory and 40% RPS scenarios assume continuation of practices that have resulted in procurement of a high proportion of intermittent renewable generation, particularly solar generation resources. The Commission requires utilities to use a Least Cost/Best Fit methodology to evaluate resource additions, and this methodology should correct for challenges presented by higher levels of intermittent resources. The "Best Fit" for future resource additions should reflect the potential for overgeneration, associated curtailment, and resource integration costs. Other renewable resources having a more constant generation pattern than solar photovoltaic resources (*e.g.*, geothermal or biomass) or the pairing of intermittent solar and wind resources with storage may be assumed to play a greater role in the future renewable fleet once integration costs, including the costs of using renewable curtailment to address overgeneration, are properly reflected in the evaluation. To test this assumption, IEP recommends that a renewable resource scenario that includes a greater level of renewable resources with more constant generation patterns should be developed over the next few months for inclusion in the Standard Planning Assumptions for the 2016 LTPP proceeding.

II. CONCLUSION

IEP respectfully urges the Commission to consider and act on the recommendations made in these comments as it deliberates on the CAISO's latest modeling study and, more important, takes action leading up to the development of the Standard Planning Assumptions for the 2016 LTPP proceeding.

Respectfully submitted May 29, 2015 at San Francisco, California.

GOODIN, MACBRIDE,
SQUERI & DAY, LLP
Brian T. Cragg
505 Sansome Street, Suite 900
San Francisco, California 94111
Telephone: (415) 392-7900
Facsimile: (415) 398-4321
Email: bcragg@goodinmacbride.com

By /s/ Brian T. Cragg

Brian T. Cragg

Attorneys for the Independent Energy Producers
Association

2970/024/X172350.v2