

CAISO Initiative on Integration of Renewable Resources

WPTF Comments on the Existing Fleet Study and Working Group Process

Questions regarding the above comments submitted on behalf of WPTF should be directed to:

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The Western Power Trading Forum (WPTF) welcomes this opportunity to provide written comments on the scope and methodology of the CAISO's study that examines whether the existing generation fleet is capable of accommodating 20% renewable energy penetration, and on the CAISO's thinking with respect to working groups that examine a range of issues around integration of renewable resources.

Existing Fleet Study

Generally speaking, the CAISO has taken a reasonable approach in its assessment of the existing fleet's ability to accommodate the 20% RPS goal by using extremely conservative assumptions, incorporating load and wind forecast errors, and "drilling down" in a limited number of time periods to examine some of the more extreme combinations of load and wind forecast errors in detail.

WPTF supports the proposed sensitivity analysis around potential retirements of existing Once-Through-Cooled (OTC) generating plants. However we also wish to point out that asset owners will be motivated to keep OTC plants in service only to the extent market revenues justify the additional capital expenditures that will be required to mitigate or eliminate cooling water thermal discharges. Therefore, we suggest the CAISO note the amounts of OTC-affected generation that it assumes will be retired and report out the results without making any firm projections about how much *will be* retired.

WPTF wishes to remind the CAISO that the most important assumptions in this study are the values that were used for ramp rates and ancillary services capacity. They are taken from the CAISO's master file and represent very conservative estimates. As WPTF has noted before, many resources can respond more quickly if the levels of compensation justify additional equipment wear and tear *and* if resource owners are not indiscriminately penalized for good faith efforts to provide exceptional performance.

Although WPTF agrees with the study's preliminary conclusion that the existing fleet can accommodate a 20% RPS requirement, we nonetheless recommend the CAISO and stakeholders agree on some objective criteria tied to study results that determine when the mix of conventional resources, hydro, "controllable" renewable resources and demand response are deemed adequate. For example, what

combination of a) a maximum threshold¹, on the number of instances of shortfalls in a particular service in an hour or in a month, and b) a maximum threshold on the energy shortfall amount² determines when the existing fleet or some hypothetical future fleet is no longer able to accommodate the target RPS.

WPTF also recommends that the CAISO incorporate in its future assessments estimates of a) the amounts of demand response under its direct control via contracts with LSEs or by bidding directly into the CAISO's markets and b) amounts of flexibility available from renewable resources that can be relied upon to provide ancillary services, ramping and turndown (or in the case of demand response, demand increases) capability. Demand response is already providing ancillary services in other ISOs. Moreover as the representative for AWEA pointed out, by removing economic impediments and providing the correct incentives, wind and other renewable suppliers would be more likely to self-manage output during minimum load periods and more precisely regulate their own ramps in response to changing meteorological conditions.

Finally, WPTF asks that the CAISO or representatives from Plexos answer a few questions about the study assumptions and preliminary results:

- Slide 17 (and others) – Please explain how the CAISO extrapolated 2012 profiles for imports, exports, hydro, solar, QF, et al from 2006/2007 historical data to? There are a number of assumptions involved in forecasts based on one year of historical data, especially when the forecast period is separated from the historical period by five or six years.
- Slide 20 talks about using "Brownian motion with Mean Reversion" to model wind and day-ahead load forecasts. This is an unfamiliar concept and stakeholders generally would benefit from a more in-depth description of what it is and how it was performed.
- 2006 was probably a 1 in 10 (or better) wet hydro year. Is the CAISO doing any wet year / dry year sensitivities?
- General question: when looking at the variation between the hour-ahead load forecast and actual load / actual generation, please explain the relative contribution of (1) hour-ahead load forecast error to (2) generation volatility due to increased intermittent penetration? (1) is with us now; how large do we expect (2) to be?
- Slide 30 notes that hydro A/S capability is based on 2006 peak hour capability. 2006 was a 1-in-10 wet year? Furthermore, the 2006 peak was relatively early in the season - the end of July, which means water was still relatively available. On this basis, isn't a projection of 2012 hydro AS availability based on 2006 optimistic?
- Please explain how the requirements on Slide 32 were derived?
- Slide 36 notes – "In future simulations, spinning requirement penalty price will be increased above the un-served energy penalty price so that NERC reliability standards will be enforced." What about the non-spin penalty price? Has the CAISO always assumed there is enough non-spin?

¹ Or perhaps a range of values that defines a "soft" threshold.

² See for example slides 44-46 of the CAISO's published handout.

- Slide 47 notes: “At this point in the study, these violations may not be significant, since many (if not all) of the AS violations would be eliminated if we allowed more flexible hydro modeling, or assumed some AS procurement available from imports.” If the CAISO allows for AS imports, will it hold import transmission for the AS imports as well? The CAISO can't assume the ties are fully utilized for energy imports and still have room to import AS at the same time.
- Please explain how the natural diversity between wind regions is being captured?
- Can the CAISO distinguish between AS violations that result from a lack of installed and available AS capacity and violations that are caused by an inability to commit AS-capable resources in a timely manner?

Working Group Process

WPTF commends the CAISO for reaching out to stakeholders and for suggesting a more inclusive approach to defining study scopes and assumptions. The CAISO can and should take advantage of the breadth of experience and knowledge that exists in the stakeholder community, and WPTF looks forward to working collaboratively with the CAISO and other stakeholders.

WPTF has one overarching general concern with the CAISO's study plan, which is its tendency to focus on specific ways to meet the CAISO's renewable integration needs before those needs have been fully defined. The Fast Regulation study, for example, presumes that a fast regulation product may prove useful at some point even though the CAISO has not yet defined its regulation requirements under a 33% RPS goal. Similarly, the Fleet Characteristics Study presumes conventional supply, likely from resources yet to be built, will be the principal means for meeting the CAISO's requirements for renewable integration services when the complete suite of those services has not yet been defined. For these reasons, WPTF continues to believe that the suite of services must be fully defined earlier in the process rather than later.

Regarding some of the specific operational studies proposed by the CAISO³:

- WPTF supports the CAISO's Ramping and Ancillary Services Evaluation, but we think it should be taken one step further to define a set of objective rules or formulas for determining ancillary service and ramping requirements. It is the need for these services that will drive investment and innovation. Adequacy studies only provide a binary answer – forecast resources either are or are not adequate. Studies that assess needs are more useful, but they are based on specific scenarios that may or may not materialize, and that may or may not be compatible with an individual market participant's view of the future. If the CAISO also publishes a set of rules that define the levels of services it intends to procure, market participants are better equipped to make their own judgments about the market value of these services and which technologies provide the right balance of operational and cost performance. One additional benefit of this exercise is that it will provide policymakers and investors with a more objective foundation than currently exists for evaluating whether a given RPS goal is technically and operationally feasible.

³ Published handout, slide 56.

- WPTF requests that the CAISO explain in more detail why the Fleet Characteristics Study is necessary. As we have noted in our prior comments, there are a number of viable methods for meeting the CAISO’s ancillary services and ramping needs, including both demand- and supply-side options. We have also suggested that the CAISO should determine the types of amounts of services it requires in a technology-neutral fashion so that market participants can provide them in the most cost-effective fashion. In this way, the CAISO could focus on defining its needs while market participants focus on the investments and operational improvements that can best meet those needs.

Moreover, WPTF notes that the CAISO’s fleet characteristics study appears to be wholly supply-centric and focused narrowly on conventional generating resources, which means it will could ignore or minimize the contributions of other viable options. If the purpose of this study is to inform the CPUC’s LTPP by enumerating the various options that are available for accommodating renewable resources, then WPTF suggests it be expanded to include demand resources and to assess the ability of renewable resources to provide at least a portion of the CAISO’s ancillary services and ramping needs in addition to examining supply-centric options. All three general options (conventional supply, demand response and controllable renewable supply) offer cost-effective means for meeting the CAISO’s requirements and we strongly recommend all three be included in any study that informs the LTPP.

- WPTF agrees that some analysis to define the scope and severity of conditions where supply exceeds demand is worthwhile. Any Overgeneration study should examine a variety of mitigation measures, including lower bid floors, which will provide better incentives for accurate scheduling, offering dispatch flexibility, and self-supplying turndown capability; demand response, including thermal storage for residential and small commercial customers and thermal mass storage strategies; and outreach programs and incentives to encourage more dispatch flexibility from QFs (regulatory must-take generation) . Curtailments ordered by the CAISO should always be the option of last resort.
- WPTF would welcome a more detailed explanation of the objectives of the CAISO’s proposed Fast Regulation study. If the stated purpose is to assess the extent to which smaller amounts of “fast regulation” can substitute for “traditional regulation” capacity, then perhaps it is also appropriate for the CAISO to investigate whether it should instead define and acquire a product that can respond faster than more traditional sources of regulation capacity. WPTF looks forward to receiving a more detailed statement of objectives for this effort.
- WPTF notes that the purpose of the Wide Area Energy Storage and Management System as stated in Clyde Loutan’s verbal remarks last Tuesday appear to be substantially different from the objectives stated in the CAISO’s handout. Moreover, the first objective listed in the handout⁴ conveys the impression that the CAISO expects large amounts of storage to appear on

⁴ Published handout, slide 61.

the CAISO-controlled grid in the near term. WPTF agrees that initiatives to improve coordination with neighboring BAs such as ACE-sharing, intra-hour scheduling at the interties, however would like to see more details from the CAISO about this Wide Area Energy Storage and Management System prior to initiating any study work or spending money on software design and development.