CALIFORNIA ISO
RENEWABLE INTEGRATION – MARKET AND PRODUCT REVIEW: PHASE 2

COMMENTS OF THE STAFF OF THE CALIFORNIA PUBLIC UTILITIES COMMISSION ON THE REVISED STRAW PROPOSAL OF AUGUST 29, 2011

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September 22, 2011

The Staff of the California Public Utilities Commission ("CPUC Staff") appreciate this opportunity to comment on the California Independent System Operator's ("CAISO") revised straw proposal for a *Market Vision and Roadmap* in Phase 2 of *Renewable Integration – Market and Product Review* ("Renewables Integration Initiative"). The CPUC Staff appreciate and support the CAISO's decision to move more gradually on the most fundamental market design reforms, allowing time to deploy and assess short-term flexibility-providing measures already underway. This will provide additional opportunities to assess westwide developments regarding intertie scheduling, variable resources and balancing coordination; studies of California renewable resource scenarios and their integration implications; prospects for significantly improved wind/solar forecasting and how it can impact both the integration study results and the market enhancement priorities; and lessons from other ISOs, RTOs and control areas. It is *essential* that the CAISO's efforts in this Initiative reflect and take advantage of such developments.

These comments address several specific areas on which the CAISO has requested stakeholder feedback.

1. Key Drivers as Renewable Integration Moves Forward

At the September 12 stakeholder meeting, CAISO staff asked stakeholders to comment not only specifically on the revised straw proposal but also more generally on key considerations or drivers going forward. The CPUC Staff believe that *some* of the key drivers will include:

- California's interaction with the west including dynamic (or other) scheduling across interties, and the extent to which California imports or exports both generation variability and flexibly controllable generation;
- The composition and characteristics of California's renewable generation portfolio, and in particular the extent of variable distributed renewable generation, whose integration will pose new challenges;
- The role, characteristics and timing of nonconventional sources of system flexibility, which appears to mean almost all sources other than gas-fired and storage hydro generation;
- How issues surrounding expected retirements of once through cooling units are resolved; and
- The extent and nature of improved wind and solar forecasting and impact on system operations

2. Cost Causation

The CPUC Staff agree that cost causation is an important consideration for developing and allocating costs of flexibility measures to support renewable integration. But it is not the only important consideration, and it should be applied taking into account the full context of market, policy, and system operations objectives. The principle of cost causation should not be applied in a way that undercuts overall cost *minimization* that benefits ratepayers and the state's economy. First, there are multiple valid and constructive perspectives about who "causes" integration costs, including: the designer, builder or owner of renewable generation facilities; the LSE or other entity that is buying the output of these facilities; the operator or scheduling coordinator for the facilities; or the state of California by establishing and administering the renewable energy policy and requirements.

Second, it is important to allocate costs directly to entities who can most directly control them, and who can manage, bear and reallocate the risks (of paying). This includes directly allocating costs in a manner that is straightforward and transparent, and/or otherwise facilitates subsequent distribution of responsibilities and risks via contractual or other arrangements. Allocating costs directly to variable generators even if they are not in a good position to do the above may strictly follow an interpretation of "cost causation" but could yield less efficient results.

Third, the "cause" of integration costs and amenability of the costs to allocation will depend on what mechanisms and sources of system flexibility (for renewable integration) are

developed and deployed and how compensation for such services is arranged. Until this is established such as via the present initiative, specific decisions and market designs regarding cost allocation may be premature or unnecessarily contentious.

Finally, the CPUC Staff agree with a statement made at the September 12, 2011 stakeholder meeting that future FERC actions or policies that are not yet clear could have significant bearing on how cost causation or other cost allocation principles can be applied.

3. Technology Agnosticism

"Technology agnosticism" appears to be established as one key principle in the CAISO's Renewable Integration Initiative.[1] Like cost causation, this principle can be interpreted and applied in multiple ways depending on the situation, and it can cut both ways. Changing existing market designs to remove barriers or facilitate participation by certain technologies (e.g., regulation energy management to facilitate participation by storage) could be equally seen as favoring those technologies, or as correcting biases or limitations in the current design that discriminate against these technologies. The CAISO should seek to facilitate maximum competition by all resources while preserving the fundamental objectives and minimizing ultimate costs.

Further, the CAISO and stakeholders should recognize that state energy policy, including the "loading order", is *not* entirely technology agnostic and will have some bearing on technology preferences. It may be desirable based on the State's energy policy to provide limited favorable treatment to facilitate the initial or "test" participation by promising technologies in the CAISO markets. This is particularly true if such technologies have previously been excluded from markets, and so long as any resulting "favoritism" is transparent, well vetted, temporary, and limited in scope (including cost).

4. Short-Term Market Enhancements (and Looking Beyond Them)

The CPUC Staff generally support the short-term market enhancements that are underway or imminent, as described in Section 7.1 of the August 29, 2011 revised straw proposal. Lessons learned and fine tuning regarding these measures should inform the need for and design of mid-

[1] This is discussed on page 8 of the August 29, 2011 revised straw proposal.

term enhancements being considered. For example, it is important that the CAISO observe and report on the results from deployment of a flexi-ramp constraint, a lower bid floor and regulation energy management, and provide stakeholders with any insights into how dynamic transfers are likely to impact both the need for (due to wind imports), and additional sources of, system flexibility.

The description and rationale for a 72-hour residual unit commitment ("RUC") needs further elaboration and discussion with stakeholders. For example, it would helpful to see some empirical evidence of the problems that would be solved with a 72-hour RUC under both present and projected conditions with higher wind/solar penetration, including what magnitude of advance commitment is calculated to be needed via this mechanism. At this time is not clear if there is a need to co-optimize a 72-hour (or other) RUC with procurement of existing ancillary services ("AS") and a proposed new flexi-ramp product. This co-optimization has the potential to reduce transparency and should be justified based on a demonstration that co-optimization would significantly reduce the amounts of AS (including flexi-ramp product) the CAISO would need to procure. Otherwise, it will be difficult to identify any benefits of implementing this co-optimization.

As short-term enhancements the CPUC Staff also support appropriately designed pay-for-performance regulation and improvements in wind/solar forecasting including improved subsequent use in market operations. This includes the more granular forecasting mentioned in Section 7.1.6 of the revised straw proposal. Beyond this, it is clear that an important basis for identifying and justifying market enhancements beyond those already underway will be demonstrated ability of those enhancements to improve the operational use of accurate wind/solar forecasts.

Finally, when planning market enhancements beyond the short term to address future challenges, it is imperative that the CAISO perform and provide transparent studies of what flexibility needs (amounts and types) are likely under different future scenarios such as regarding renewable generation mix and imports. Stakeholders need this information to understand what problems the market enhancements are seeking to address, as well as how rapidly (or to what extent) system conditions are approaching conditions that have been studied. Key analyses should include:

- What is the relationship between modeled scenarios of generation fleet composition versus where we are today, and what is being assumed for assessing market enhancements?
- How would wind/solar curtailment being considered under market enhancements change the results of particular modeled scenarios?
- How does wind/solar forecasting and its use in system operations as assumed in studies/projections compare with (1) what is occurring today, and (2) with the improvements in forecasts and their use being sought via market enhancements?
- How does the commitment logic in the modeling compare to today's commitment practices, and to what is being considered under market enhancements?
- How does the role of imported (or exported) variability and controllable flexibility as assumed in modeled scenarios compare with what is occurring today, and with what is envisioned or sought for the future?

5. Flexi-ramp Product

As the CAISO considers a new flexi-ramp product for the mid-term, it is critical to monitor and report to stakeholders on of the performance of any shorter-term flexi-ramp constraint deployment. This includes the amounts of flexible ramping procured under different conditions, the basis for selecting or calculating these amounts, and the prices, costs and subsequent energy dispatch associated with such procurement. The need for and design of a new flexi-ramp product as discussed in Section 7.2.2 of the revised straw proposal should also be informed by assessment of flexibility needs, benefits and costs based on transparent, vetted renewable integration studies under an appropriate range of resource and other scenarios (especially the CAISO's current 33% RPS operational studies).

The revised straw proposal questions if it might be appropriate and simpler to procure more non-contingent spinning reserves instead of instituting a new flexi-ramp product. The CPUC Staff believes this is unlikely since it would, in any event, entail separating the markets for contingent and non-contingent spinning reserves due to high potential for deployment of the non-contingent reserves, and it would provide upward ramping only. However, there would be greater clarity if CAISO would assess how substantial is the anticipated need for additional *downward* ramping, especially with a lower bid floor and decremental energy bidding by variable energy resources (including those in the PIRP). Furthermore, the CAISO should consider if non-contingent spinning reserves could provide emergency upward ramping for extreme low

probability "tail" events, in order to limit the amount of any flexi-ramp procured to cover the highest ramping needs.

The CPUC Staff do not currently have an opinion as to whether a flexi-ramp product should be procured based on MW of ramp per 5, 10 or 15 minutes. The CAISO in concert with stakeholders should clarify several relevant issues to help assess this and other questions, including:

- Would a shorter ramp period criterion (e.g., 5 minutes) achieve desirable goals such as allowing better market participation by energy-limited resources such as demand response and storage?
- Is it necessary to additionally characterize or parameterize procured flexi-ramp based on *absolute* capacity in addition to ramp MW per unit of time? For example if a flexi-ramp provider provides 20 MW of up-ramp per 15 minutes, is 20 MW the upper limit on how much ramp is available, or is another parameter needed to specify that the resource can provide additional ramp beyond the 20 MW in 15 minutes, or to specify that ramp capability is tied to a particular resource loading point?
- Should or would a flexi-ramp provider be returned to a set point? This would appear to affect how ramping capability from the resource should be specified, especially over successive intervals.

CAISO staff mentioned that a technical proposal regarding flexi-ramp may be released and should clarify the timing of this release and the role and timing of stakeholder input. Some other implementation issues surrounding flexi-ramp needing to be clarified via a more technical proposal and/or interaction with stakeholders including the following:

- It appears that flexi-ramp might be cascaded with existing AS, but this question needs to be resolved in connection with discussions of further implementation details.
- There needs to be further discussion and understanding of potential co-optimization of the integrated forward market, a new flexi-ramp product, and RUC, including the objectives of such co-optimization, and a clear demonstration

of cost savings or other benefits to be expected, as well as how to offset the apparent reduction in transparency and ease of implementation that such co-optimization implies.

- How much of any flexi-ramp requirement is procured on a day-ahead versus 15-minute (real-time) basis appears to be important, and the rationale and issues surrounding this division need to be explained and discussed with stakeholders. Further, this appears to have significant implications for the mechanism used to calculate flexi-ramp procurement amounts and also for potential allocation of the resulting costs.
- How the flexi-ramp procurement targets would be set is an important element of this initiative, and should be justified in part based on objective, transparent assessments of need for such a product, making fuller use of the ongoing operational studies.

The above issues illustrate why cost allocation should not be pursued in any detail until there is substantial clarification of (1) mechanisms for determining procurement need, (2) procurement itself, and (3) how providers would be compensated. The CPUC Staff believe that performance incentives for any flexi-ramp product would be desirable, as would assessment of any relevant lessons to be learned from other ISOs/RTOs.

6. Variable Energy Resource Availability Updates

As discussed in Section 7.2.4 of the revised straw proposal, breaking wind/solar hour-head forecasts (availability updates) into four 15-minute segments would provide useful value. However, if real-time commitment and procurement of the proposed flexi-ramp product would occur on a 15-minute basis, then allowing availability updates every 15 minutes would appear to provide additional value.

7. Decremental Bidding from PIRP Resources

The CPUC Staff agree that it is desirable to receive decremental bidding from wind/solar resources, both for PIRP and non-PIRP resources.[2] The CAISO should allow PIRP resources to

[2] This is discussed in the revised straw proposal, Section 7.2.5.

submit decremental bids. Besides providing useful system flexibility this should help such resources (or their LSEs/SCs) reduce exposure to negative real-time prices, and should motivate improved forecasting to support decremental bidding strategies. But before it finalizes this enhancement the CAISO should provide and allow stakeholders further opportunity to comment on implementation details, including the settlement formula for following/not following decremental bid instructions and how to any treat wind/solar resources that are not designed with the ability to curtail output in the manner envisioned by the proposal.

8. Intertie Pricing

Stakeholders need more information and opportunity to assess and discuss tradeoffs between the "NYISO approach" and the CAISO-provided approach for pricing intertie transactions.[3] For example, the CAISO needs to clarify if it proposes, and the economic implications of, clearing at real-time prices off-peak *and* at hourly prices on-peak. The cost and other implications of bid cost assurance for imports under the NYISO method require further illumination. Also, stakeholders should have the opportunity to suggest other alternatives to the two above approaches. Finally, the CAISO needs to clarify if it plans to establish a separate initiative for this issue.

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[3] This is discussed in the revised straw proposal, Section 7.2.6.