California Independent System Operator
Renewables Integration - Market and Product Review Phase 2

Comments of the California Wind Energy Association on the August 29, 2011 Revised Straw Proposal Renewables Integration Market Vision & Roadmap

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Introduction

The California Wind Energy Association appreciates the opportunity to comment on the California Independent System Operator's (CAISO) revised straw proposal, released on August 29, 2011, which is intended to present the broad plan and some of the details of a new course for the reform of its electricity market to better address the system flexibility needs of the CAISO grid. The need for enhanced flexibility can result from the integration of increasing volumes of variable renewable energy resources (VERs), increases in load, large scale retirement of flexible OTC plants, or other sources of system flexibility needs. This revised straw proposal follows the CAISO's "Issue Paper on Phase 2 Market Product Review" (Phase 2 MPR Issue Paper), released on April 5, 2011, and the CAISO straw proposal, released on July 6, 2011, for a Day-Of Market (DOM). CalWEA submitted comprehensive comments on both those CAISO proposals.

In the following comments, CalWEA presents its views on the CAISO's overall approach, on its guiding principles, and on the specific components of the CAISO's multi-stage market reform plan.

Comments on Statement of Purpose Revisions

This latest CAISO revised straw proposal makes a critical and positive change in its approach to market reform, by avoiding a rush into a set of specific solutions. Instead, the CAISO presents a "holistic," thoughtful, and evolutionary plan for developing and implementing those market reforms that the CAISO believes it needs to deal address the system flexibility

needs of the CAISO grid in 2020. We support CAISO's proposal in that it divides its market reform efforts into three timeframes:

> "[T]he ISO is proposing incremental design changes to be developed and implemented between now and 2020, building on enhancements that are already underway for implementation in 2012-13 and emphasizing mid-term solutions that can be implemented in 2013-2015. Long-term solutions after 2015 may include revised market timing, such as a 15-minute real-time market, as conveyed in the ISO initial straw proposal."

One of the most significant benefits of this evolutionary proposal is that it allows the CAISO to gain more experience with grid operations in the presence of a gradually increasing volume of VERs, with the roll out of a WECC-wide plan to adopt 15-minute inter-BA scheduling, and with several market reforms that the CAISO intends to implement in the near future.

However, one fact is clear: an increasing volume of VERs, increases in load, retirement of around 20,000 MW of flexible OTC plants, and continued inflexibility of nuclear plants will collectively result in an increased need for system flexibility. Now, it is understand by all that part of the need for additional system flexibility will be met by adding new gas generation as well as storage and demand response resources. However, changes in the CAISO's market can also address system flexibility needs in two ways: 1) market reforms can release additional flexibility from all system resources including conventional resources and VERs; and 2) reforms can reduce the need for system flexibility. Based on our review of the CAISO's revised straw proposal, the CAISO's plans for short term market reforms mainly aim to release more flexibility from system resources. We believe that market reforms that reduce the need for system flexibility also should also be considered and, better yet, implemented as soon as possible.

For example, one of the major drivers of the need for increased system flexibility is the forecasting error of VERs' output, whereby such forecast error increases almost exponentially as the forecast time period increases. We believe that this major driver of the need for system flexibility can be partially or fully mitigated by the scheduling of major system resources as close to the real time as possible. One seemingly straightforward solution that can help to meet this need is to move the Day-Ahead (DA) market structure timeline as close to the day of operation as possible. Another useful reform would be to allow for more granular scheduling (with 5 to 15 minutes time intervals as opposed to the current 1 hour time interval). We believe that such changes will be consistent with the changing characteristics of the generation fleet in CA. Alternatively, a set of multi-hour (4 to 6 hours) forward market structures could be introduced on the day of operation as a supplement to or potentially as a replacement for the current DA market structure. **CalWEA recommends that the CAISO consider these market timing changes, which we believe can significantly ameliorate the need for system flexibility, as part of the CAISO's mid-term (or, if possible, short-term) market reform activities – as opposed to the CAISO's new proposal that these changes be delayed until the post-2015, long-term market reforms.**

Comments on Guiding Principles

The CAISO's revised straw proposal repeats the "Guiding Principles" that the CAISO presented as part of its DOM proposal on July 6, 2011. CAISO continues to state that it intends to follow those guiding principles in its overall market reform efforts. As we stated before, CalWEA appreciates the potential benefits of a clear statement of a program's goals and principles. But we want to repeat our warning that, ultimately, any market reform proposal must be acceptable to the FERC, be consistent with the CAISO tariff, and make sense for market participants. There also will be occasions when it may not be possible to follow these principles.

Furthermore, CAISO has added the principle of "Cost Causation" to its set of Guiding Principles. While CalWEA does not have a fundamental objection to using the concept of cost causation as a principle for allocating the cost of system operation, we have serious concerns with the simplistic application of this principle. For example, the CAISO's recent studies on renewable integration show that the CAISO system in 2020 with 33% renewables does not require any new sources of system flexibility. Once the CAISO increased the load by 10%, with more or less the same volume of VERs as the 33% case, it found that around 4600 MW of new gas resources were needed to provide, among other things, system flexibility. Would it be appropriate to allocate the need for additional gas resources to VERs? To answer "yes" would be a simplistic application of cost causation; in fact, the example appears to imply that it is not 33% renewables, but rather the 10% load increase that is the main cause for the additional system resources.

To conclude, we believe that it is much easier to talk about the principles of cost causation but much more difficult to accurately and equitably quantify cost causation and use it for cost allocation. However, if the CAISO insists on following the cost causation principle for allocating various system flexibility costs, we would expect that the following rules be adhered to:

- All factors that trigger the need for system flexibility must be considered. As a matter of principle, all system resources, old or new, that do not exactly follow load trigger the need for system flexibility. As such, a nuclear plant whose output does not vary triggers the need for system flexibility.
- The exact cost causation mechanism for sources of system flexibility must be clearly and precisely defined before they can be used for cost allocation purposes.
- The determination of the actual system flexibility cost caused by a driver must be performed on a consistent basis. It is not appropriate, for example, to aggregate load at a bus or DLAP levels when determining the overall cost impact of load variation on system flexibility needs, while insisting that the marginal cost impact of a VER should be extracted individually and separately.
- All system flexibility needs must be accounted for. For example, we cannot ignore the fact that the primary need for procuring system operating reserves is due to the

high forced outage rate of conventional (gas, hydro and nuclear) resources. If we are to be consistent in applying the principles of cost causation, we must assign the bulk of the costs of procuring operating reserves to conventional generation resources.

- Finally, it is extremely important to consider the overall impact on ratepayers from a particular cost allocation policy. For example, when shared system costs are directly allocated to an independently-developed VER, the VER has to account for that cost, and the uncertainty of what that future cost may be, as part of its project financing. That process normally leads to additional financing premiums, sometimes in significant amounts, that have to be covered by the resource. Such financing premiums will eventually (directly or indirectly) be passed onto the ratepayers. If the VER is not the entity that is best-equiped to minimize these system costs, the result will be higher costs for ratepayers to meet the state's RPS goals.

Comments on Short-term Market Enhancements

As we stated above, CalWEA supports CAISO's intentions to study the impact of its short term market reform initiatives, many of them already underway, for effectiveness and potential sufficiency before undertaking major new market reform initiatives. However, as noted earlier, we think the CAISO should consider taking on the market timing reform as soon as possible – possibly in the short-term, but certainly no later than its mid-term market enhancements.

In the following we present our comments on the specific elements of the CAISO short-term market enhancements as presented in its revised straw proposal.

Regulation Energy Management (REM)

CalWEA understands the need for the CAISO to procure more regulation services for its footprint as the state's renewable penetration increases. However, we expect that the CAISO will refrain from simply relying on the regulation values calculated in its 20% renewable integration study for determining the amount of regulation to be procured in its markets. This is due to the fact that the mix of VERs and many other key factors that influence the need for regulation service will be quite different from those used in the CAISO 20% renewable integration study. Instead, the CAISO should develop suitable methods/formulae for determining the amount of needed hourly regulation capacity on daily basis, and use the daily derived needs, derived using such formulae, for its procurement purposes in forward markets.

CalWEA would like to also note that we are very encouraged that, as part of its REM implementation, the CAISO intends to rely on all sources of regulation including generation, storage, and demand side resources.

Dynamic Transfer Policy

CalWEA has consistently supported the CAISO's initiative to develop clear and effective dynamic transfer protocols that will facilitate the dynamic transfer of renewable resources into and out of the CAISO Balancing Area (BA). We also support the CAISO's filing with the FERC of a scheduling option for eligible intermittent resources to submit intra-hour dynamic schedules to the CAISO in order to more efficiently use the transmission capacities for dynamic transfers. We are, however, concerned that the firm transmission reservation requirements for dynamic transfers that apply to WECC BAs outside CAISO (and to a lesser extent the intertie import capacity allocation practiced inside the CAISO BA) will continue to make it extremely difficult, if not impossible, to use these dynamic transfer protocols to actually import renewables into the CAISO footprint. Hence, CalWEA recommends that the CAISO work with the WECC to change the onerous firm transmission reservation requirements for dynamic transfers.

Flexible Ramping Constraint

CalWEA supports the CAISO's efforts to model the ramping requirement as a constraint in its RTPD markets. We also believe that ramping constraints should be accounted for as part of the DA market structure so that resources with proper ramping capabilities would be committed in the first place for real-time operation the next day. We understand that the introduction of such a constraint can increase the marginal energy price which should, at least partly, compensate scheduled resources that provide the needed ramping capability. Hence, we do not see a need to introduce a separate market product for the purpose of procuring ramping capability, as discussed further below.

Energy Bid Floor

As we have stated in our comments on the CAISO RI-MPR 1, CalWEA supports the gradual reduction of the energy bid floor from the current -$30/MWh to -$150/MWh and then to -$300/MWh. Similar to the CAISO, we believe that this reduction in the energy bid floor will encourage both conventional resources and VERs to offer decremental bids into the CAISO market, thus increasing system flexibility capability within the CAISO BA.

Bid Cost Recovery

As we have stated in our comments on the CAISO RI-MPR 1, CalWEA supports changes in the CAISO bid cost recovery rules so that netting occurs separately in the day-ahead and real-time markets. We also believe that this change will provide a stronger incentive for conventional resources to provide economic bids in the real time. This will also increase system flexibility capability within the CAISO BA.

72-Hour Residual Unit Commitment

CalWEA supports changes in the CAISO DA market structure to extend the day-ahead market process to a 72-hour look-ahead for the RUC part of the DA market, rather than a single 24-hour look-ahead process. We also believe that extending the unit commitment look-ahead process to a configurable 72-hour period provides for a better optimization of resource commitment, particularly as related to extremely long-start generators. Of course, we are concerned with the forecasting accuracy needed to make 72-hour RUC work well. In the longer run and as more long-start generators retire due to age or OTC requirements, we see the use of the 72-hour RUC process as a complement and precursor to the multi-hour forward markets that we advocated earlier in these comments.

More Granular Variable Energy Resource Forecasting for RUC

As part of this reform, the CAISO intends to increase the granularity of the RUC zones to include VER zones to better capture locational VER forecast variability. It is not clear to CalWEA whether or how this proposed market enhancement will increase system flexibility in a cost effective fashion. To clarify the benefits of this proposal, we request that the CAISO work closely with the stakeholders to explain the proposal in more detail.

Startup and Shutdown Profiles

CalWEA supports CAISO's planned enhancements in modeling the startup and shutdown of generating resources to better account for the energy delivered during these periods in the ISO's real-time energy imbalance calculations. We believe that better accounting of the capabilities of system resources will lead to more reliable and efficient system operation and improved performance-based compensation, especially for conventional resources.

Enhanced Contingent/Non-Contingent Operating Reserve Management

CalWEA supports the CAISO's plan to enhance its management of operating reserves by designating only the additional operating reserves (spin and non-spin) procured in real-time as contingent-only reserves. This enhancement, would replace the CAISO's current practice of designating both the initial and any additional procured amounts as contingent reserve even if the initial amount procured in the day-ahead market was non-contingent, will increase the sources of system flexibility available to the CAISO for real-time operations.

Mid-term Market Enhancements – 2013 through 2015

For the reasons that we cited earlier, CalWEA supports the CAISO's plan to move the discussion of some of its proposed market enhancements to future years.

Real Time Imbalance Service (RTIS)

CalWEA generally supports the concept of RTIS subject to caveats that we presented in our comments of July 29, 2011. We have attached those comments for convenience.

Flexi-ramp Product

CalWEA sees the importance of ensuring that resources that are committed and dispatched as part of the DA and RT markets have enough ramping capability to meet system ramp needs. As we indicated earlier, we believe that CAISO should add system ramping requirements as a constraint for both the DA and RT markets. In that fashion, the CAISO can ensure that the resources that it commits as part of the DA market have proper ramping capabilities to meet the system ramping needs during real-time operations the next day.

However, we are not yet convinced that this constraint on market operation should be converted into a separate capacity product to be procured using a separate marginal cost pricing mechanism – similar to the way the operating reserves are procured. Our inquiry at the stakeholder meeting indicated that the CAISO has not conducted sufficient analysis to ensure that introduction of the Flexi-ramp product is the best mechanism for the CAISO grid to meet its ramping needs. Hence, we would ask the CAISO to demonstrate why it should introduce the Flexi-ramp capacity product rather than continue to model the ramping need as a constraint in its commitment and dispatch processes.

If, based on a sound assessment of the alternatives, the CAISO determines that a Flexi-ramp product is required, it is critical that adjustments to the CAISO's various market protocols and timing be made to ensure that the CAISO only procures the necessary levels of such a product. For example, changes in market timing, if necessary, should make it possible to procure 5-minute, rather than 15-minute, worth of Flexi-ramp in DA and RT markets. Also, the forward need for the Flexi-ramp for the day of operation should be made as part of the DA market structure using accurate (and as yet to be determined) algorithms, instead of some fixed maximum hourly amounts calculated on a monthly or seasonal basis as part of an off-line study. These considerations will significantly reduce the cost of procuring the Flexi-ramp product. Finally, we currently have no position on the formula proposed by the CAISO for allocating the cost of procuring the Flexi-ramp product, except that we have the following questions for the CAISO:

- Does the formula proposed by the CAISO accurately reflect the cost caused for procuring the Flexi-ramp product? At this time there seems to be no clear analytical or empirical reasoning to indicate whether the current CAISO's proposed cost allocation formula reflects actual cost causation.
- Does the CAISO intend to come up with similar formulae for allocating the other capacity products (e.g., operating reserves) that it procures as part of the DA and RT markets?

Variable Energy Resource Availability Updates

As we have indicated in our previous comments, and as we repeat here, CalWEA strongly supports any CAISO market mechanism that allows VERs to schedule or update their availability with increased granularity. We believe that such capabilities will help reduce the system flexibility requirements. CalWEA considers the CAISO's proposal to allow VERs to submit four 15-minute schedules 75 minutes ahead of the operating hour as a good start. We believe that the use of such schedules – for determining both the forward and real-time imbalance settlements, as the basis for the allocation of the cost of any CAISO existing or new product such as Flexi-ramp – should be made only after it is clear that this feature will address and mitigate the inherent settlement risks of the CAISO market for VERs. If settlement risks can be sufficiently reduced for VERs, the need for the PIR program would be reduced.

Decremental Bidding from PIRP Resources

CalWEA understands the potential of this proposal to increase the system flexibility capability of the CAISO grid. However, many elements of this proposal, including the appropriateness of its settlements formula, are still unclear to us. As such, we ask that the CAISO work closely with the stakeholders to discuss the details of the proposal.

Intertie Pricing

The mechanism under which this proposed mid-term market enhancement will increase the system flexibility capability of the CAISO grid in a cost effective fashion is not clear to us. As such, we request that the CAISO work closely with the stakeholders to discuss the details of the proposal.

Long-term Market Enhancements – 2015 through 2020

For the reasons that we cited earlier, CalWEA supports the CAISO's plan to move the discussion of some of its proposed market enhancements to future years.

Forward Procurement

CalWEA generally agrees with the premise that the CAISO should have the authority to procure, on long-term basis, some non-RA capacity that is solely needed for system flexibility. However, before such a plan is adopted and its details worked out, we recommend that the CAISO, in coordination with the CPUC, consider the following:

- The determination of the level of Planning Reserve Margin (PRM) at 15% to 17% of the peak load should be fundamentally re-examined. These straightforward figures were calculated based on outdated stochastic production simulation studies that

assumed that the demand was met using conventional generation resources. An update of the PRM figure based on the generation resources that are expected to include large volumes of VERs is essential and could lead to PRM values well above 15 to 17%.

- The CPUC should specify, based on input from the CAISO, the specific flexibility characteristics of the resources that are to be procured as part of RA capacity procurement. We expect such a specification of RA resource flexibility requirements will increase system flexibility of such resources and reduce the amount of extra capacity, if any, that would need to be procured via the proposed CAISO long-term procurement process.