



Due: July 29, 2011

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**RE: Comments of the Large-scale Solar Association on the Initial Straw Proposal – Market Vision & Roadmap/Day-of-Market for RI-MPR Phase 2**

The Large-scale Solar Association (LSA) appreciates the opportunity to offer these comments on the CAISO’s “Initial Straw Proposal – Market Vision & Roadmap/Day-of-Market” (“Proposal”) for the Renewables Integration – Market & Product Review, Phase 2 (“RI-MPR2”), and the discussion at the July 7<sup>th</sup> stakeholder meeting to discuss it. In response to CAISO’s Discussion and Scoping Paper, LSA offered extensive comments and recommendations on priorities for this initiative.<sup>1</sup> We are pleased that at least some of our earlier views are reflected in this Proposal, and we recognize that the CAISO needs to focus initially on fundamental elements that would provide a foundation for more extensive changes to market design.

The Proposal has these elements:

- **“Day-of Market Design Enhancement.”** Day-of Market (DOM) is the CAISO’s new term for “all market processes and activities ...performed during the operating day” after Day Ahead Market (DAM) scheduling and awards, and the initial DOM proposals – to improve reliability and market efficiency – are included in the Proposal document.
- **“Day Ahead and Forward Market Design Enhancements,”** which would be designed to support DOM enhancements.
- **“Comprehensive Market Design and Roadmap”** – a big-picture “vision” for proceeding from here, and a “roadmap” for a longer-term effort to get there.

These elements would be developed in a series of overlapping proposals over the summer and fall. CAISO Management plans to present the entire package to the CAISO Board for consideration at the December 15<sup>th</sup> meeting.

LSA has the following general comments on the Proposal:

- We support continued reference to, and development of, the Guiding Principles in the Proposal, particularly as the CAISO begins a process that could significantly change the market design. We agree with CAISO that these Principles can help set the foundation for an efficient market design. We suggest that the CAISO spend some additional time considering the issues raised by the principles at a higher level. We believe there is an overarching goal that can offer

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<sup>1</sup> “Comments of the Large-scale Solar Association on the Discussion and Scoping Paper on Renewable Integration Phase 2,” April 29, 2011.

guidance when tradeoffs must be made between Guiding Principles. Also, it may be prudent to consider which issues CAISO has the best tools to resolve within their markets and which issues would be best addressed in another forum. We also recommend a few examples that could be added to the "expected outcomes" that can provide clarification and guidance.

- The CAISO has not yet justified the need for major market changes. The CAISO should conduct further analyses to verify to the extent possible that the proposed changes would achieve the desired outcome and that the benefits would outweigh the costs.
- The CAISO's issue paper indicated an interest in ensuring that changes are cost effective. To that end, we recommend that certain cost benefit analyses be done to support proposals; the existing timeline likely does not provide sufficient time to enable this analysis.

LSA has the following specific comments on the Proposal:

- The CAISO should clarify the nature of RTIS – e.g., whether it is really: (1) a subset of Regulation; or (2) a supplement to, or subset of, regular Imbalance Energy (I/E) service.
- The CAISO should better support: (1) its statements terming RTIS the definitive measure of “variability” on the system, e.g., why that term better applies to RTIS than to Regulation or I/E; and (2) any RTIS cost-allocation proposal that differs from the allocation of costs for those other services. Also, it is not clear that allocating the cost of this RTIS to load and generators will achieve the desired results. Allowing VER generators to participate in RTIS markets may provide a more efficient market solution.
- The CAISO should provide more information on the schedule timing and imbalance provisions in the Proposal. That information is needed to determine whether, for example, the more-granular VER scheduling provisions would really serve to mitigate imbalance risks and reduce the need for PIRP for new resources.

These comments are discussed further below.

## **General comments**

**Guiding principles:** While some of these Principles are straightforward and easy to support, others clearly present conflicts or tradeoffs between them, or other objectives in the market. For example, the “technology agnostic” principle does not consider reasonable accommodations that the CAISO makes for different technologies, like multi-stage generation, load resources, or fast-ramping limited energy storage resources (and, currently, for VERs (PIRP)).

LSA also proposed some principles in our earlier comments that have not been fully reflected yet in these principles. First, we identified an overarching principle for the Renewables Integration effort, rephrased here: "the overarching goal of various renewable integration efforts, including the LTPP and the RI-MPR2 is the reliable integration of California's targeted renewable energy while managing overall cost of RPS implementation"; this suggestion was not adopted; we encourage including this type of a goal, as it can provide guidance as tradeoffs inevitably must be made between the Guiding Principles.

Second, LSA recommended resolution of existing market inefficiencies, as a precursor to evaluation or allocation of renewable integration costs; we do not see the CAISO tackling this issue in the straw proposal, but continue to advocate for reduction of existing market inefficiencies.

Third, we also suggested coordination with other regulatory processes and consideration of the most appropriate timing for incentives. As we review the CAISO's guiding principles, we do not see any guidance on what types of issues are best addressed within the CAISO market, and which issues are best addressed in other forums, such as the LTPP or RPS proceedings or in the upfront IOU procurement decisions. The "overarching principle" mentioned above could potentially provide guidance.

Finally, LSA also recommended accurate determination of VER integration costs that serve as a basis for integration charges. We appreciate that the CAISO has sought to modify existing markets in order to structure a transparent cost. However, we feel there is more to learn and understand before any costs should start to be allocated, if it is determined that such allocation is in the interest of the ratepayers.

As mentioned above, LSA provides the following additional "expected outcomes" to help clarify and describe various Guiding Principles.

- Additional expected outcome (1): "Cost of RPS generation is managed through assessing the cost efficient mix of long and short term revenues and penalties."

Generally, risk and uncertainty should be borne by the party that can best quantify the cost, minimize the cost, or mitigate the cause of the cost. If the costs for integration are set during real time markets operations, they are not known at the time of financing. The risk and uncertainty around integration costs disproportionately increases the cost of financing relative to the anticipated actual cost of the integration. In this case, the ratepayer is best able to minimize the collective cost of this uncertainty. As described below, we also don't believe that the individual VER generators have the most effective means of mitigating integration quantity or cost. We recommend that the ratepayers take the integration cost risk, but incent VER generators to participate in the RTIS or related markets. The ratepayers will be able to receive the energy for a lower PPA price, because the revenue risk is lower. This lower PPA price should compensate for both its allocation of integration costs as well as the incentives required to integrate renewable generation at the system level. At first look, it may seem that charging the integration cost to the generators would be lower cost than providing the same generators an incentive to participate; however, taking a holistic view comes to a different conclusion.

- Additional expected outcome (2): "Resources are incented to address problems at the most efficient system level."

For example, because of the significant nature of spatial diversity, the total need for response will be lower at the system level than if implemented at the plant level.

Under the price signals category, the straw proposal identifies: "*Prices incent performance from supply and demand that supports operational needs and encourages mitigation of generation variability and congestion.*"

We disagree with the concept that price signals alone can encourage the mitigation of system-wide generation variability. Prices or charges can only incent a certain response if there is both 1) a cost effective ability to perform the sought response, and 2) sufficient information to know the level of response needed. Without these additional factors, prices or charges are not certain

to encourage the preferred behavior. As explained in more detail below, because of the significant nature of spatial diversity, having generators make individual decisions about curtailment is likely to be counterproductive.

**Need for changes, including RTIS:** CAISO studies to date have shown the need for increased operational ramping as well as procurement of additional reserves to meet load-following and Regulation requirements. However:

- Those studies did not consider potential mitigating factors, including new, fast-ramping resources (e.g., storage, plug-in hybrids, some forms of load), better integration of ramping needs into unit-commitment algorithms, and more accurate and granular forecasting capability. Some of these factors will be evaluated in Phase II of the LTPP integration studies, which the CAISO supports.
- The remaining potential problems cited as motivation for the elements in the Proposal – over-generation, inertia and frequency-response problems, voltage support and ride-through problems – are not yet well-defined and will need further study.

The mitigating factors cited above are mentioned in the Proposal, but the Proposal does not appear to consider their ability to address the problems cited and whether further changes to market design would really be needed. Likewise, over-generation potential can be addressed through existing market mechanisms (negative pricing and more-flexible PPA terms that are already incorporated into new contracts).

LSA recommends that before proposing to the Board very specific changes like RTIS, the CAISO should complete analyses clarifying alternative solutions to the operational requirements that the changes are intended to address and how the changes would address those requirements. This burden has not yet been met for the changes advocated in the Proposal.

**Process for this initiative:** The CAISO’s desire for the proposed overlapping timing for the different phases of this initiative is understandable, but it may not be feasible. It will be difficult to begin the next phase when the prior one is not final, especially if there are controversial and/or open issues with the phase being completed. Instead, the CAISO should consider a more orderly process that would complete one project phase before beginning another.

### ***Specific comments***

**Nature of RTIS:** During the stakeholder-meeting discussion, the CAISO stated that RTIS could be a subset of the Regulation requirement, but there was confusion around that point when it became clear that the CAISO is not sure whether RTIS dispatch would be automatic (e.g., via AGC) or via ADS like I/E. LSA is not sure that RTIS, with its slower dispatch, could substitute for Regulation even with an AGC signal, and especially with an ADS dispatch.

Put another way, if RTIS is a subset of Regulation, and thus what would otherwise be Regulation purchases would now be split between Regulation and RTIS, LSA does not see how RTIS (even with an AGC dispatch) would increase CAISO ability to manage the system when RTIS would be so much slower. It would take more RTIS capacity to substitute for much faster Regulation to give the CAISO the same degree than an all-Regulation procurement of load-following service, and then it is not clear whether a Regulation/RTIS split would be more economic than straight Regulation.

Alternatively, while the Proposal classifies RTIS as an “Ancillary Service” (A/S), depending on the dispatch method it may really function as a faster version of regular Imbalance Energy (I/E) service, not a Regulation substitute. In that view, it is easy to see how RTIS would increase CAISO operational control, since the 1-2 minute RTIS dispatch would replace or supplement the 5-minute (or, depending on the optimization choice, 15-minute) I/E dispatch by returning Regulation resources to their “null” point and follow longer-term load and VER changes much faster.

However, since the CAISO does not make capacity payments (or mileage payments) to I/E service providers, RTIS may not be more economical than provision of I/E without RTIS. Thus, it may be necessary to do some kind of optimization of control vs. cost.

LSA would also like to better understand CAISO's reasoning for selecting the 1-2 minute RTIS dispatch time period, e.g., why it did not choose 2.5 minutes or 5 minutes. How fast should generators be responding to signals for each of these products? Are all resources that currently respond to 5 minute RTD also able to participate in a RTIS market? If not, then the cost of net load following could increase.

As noted above, to help clarify the operational and market value of this service, the CAISO could conduct an analysis of the data from the LTPP scenarios (all gas vs. trajectory at a minimum) to compare the needs derived under the proposed rules to the needs under the existing rules. This analysis should determine whether there is a reduction in the total support needed and how much of each service is needed, and determine whether there are sufficient resources on the grid that can provide these services.

**Cost allocation for RTIS:** The Proposal calls RTIS “a measure of the cost of balancing or variability on the ISO system” and states that “if all market participants were able to keep their load and production exactly at what was scheduled for them in the RTED there would be no need to procure RTIS.” However, the same statements could be made for Regulation or regular I/E service.

If RTIS is a subset of Regulation, it is simply a less-granular way to address the same kinds of problems and should be allocated to load, like Regulation. If RTIS is a subset or supplement to I/E, it should be allocated like I/E. There are simply no grounds for anointing RTIS as the sole “measure” of variability on the system and allocating those costs in a different manner than those other services.

In determining any charges for RTIS, the CAISO should consider whether the charge structure would result in the desired response. It is possible and even likely that having individual generators managing ramps will contribute to a net increase in RTIS required, because: (1) many or most VERs will only be able to manage ramps through energy curtailment; and (2) there is spatial diversity on the grid. Two simple examples help to illustrate the point:

- Solar Plant A is 10 MW over schedule and Wind Plant B is 10 MW under schedule. In that situation, Plant A curtailment by 10 MW would increase the net imbalance on the system.
- Solar Plants A and B are operating as described above and that Plant C is also 10 MW over schedule. There is a net need for curtailment, but if all the over-producing generators (Plants A and C) curtail to their schedule, the group would overshoot its target and the net would now be 10 MW under schedule.

So, this solution is also imperfect in obtaining the desired result.

CAISO markets – Regulation, RTIS, and I/E – would be far better at managing imbalances than per-MW or per-MWh charges for each generator, because the markets address the net needs of the whole system and ensure that the resources curtailed are the most economic, rather than incenting individual generators to take actions that might actually damage grid reliability. The CAISO could probably obtain higher overall market efficiency by allowing and encouraging renewable generators to participate in CAISO markets to the extent they are capable. Individual generators would decide whether to participate and at what bid price.

VER compliance with CAISO Dispatch Instructions could be verified through new performance models based on meteorological data. Curtailed output relative to expected output could be audited.

In addition, before allocating additional costs to VERs, the CAISO should carefully consider the procurement costs to ratepayers of a structure that allocates uncertain integration costs to renewable generators in a real time market, since that uncertainty will increase project financing costs. These costs cannot be determined in advance, beyond a likely distribution of costs. A financier would select the most conservative figure for determining generator ability to pay, and a developer would need a higher PPA price for ratepayers to compensate for the risk, equal to the greatest potential integration cost.

LSA requests that the CAISO share its perspective on the merits of elective VER participation in CAISO markets vs. mandatory VER participation through cost allocation.

**Five- vs. 15-minute optimization:** There is not enough information in the Proposal to compare these two options. Features listed as “pros,” like the ability with a 15-minute optimization to include unit commitment in the optimization are difficult for stakeholders to evaluate without additional information, like whether the presumably more-efficient 15-minute optimization of unit commitment would result in lower costs even with a less-efficient 15-minute I/E dispatch

**VER scheduling granularity:** The Proposal is very unclear about scheduling and imbalance provisions for VERs. The 15-minute market optimization seems to provide for 15-minute schedule submission, but it is not clear whether that means four 15-minute schedules submitted 30 minutes in advance or schedule updates every 15 minutes during the operating hour. The Proposal states that even the 5-minute market optimization might provide for schedule “updates,” potentially with that level of granularity, but again the timing of the submission is unclear.

The CAISO clarified at the stakeholder meeting that these more-granular submissions would have to be self-schedules – i.e., without economic bids – which would seem to go against the CAISO’s desire to encourage economic bids from VERs.

Finally, and of critical importance, the CAISO must clarify how imbalances from different schedule submissions – Day Ahead, pre-Real Time (30 minutes in advance), and (if applicable) during RT – would be measured and billed. It is impossible to assess how the schedule timing and granularity would help VERs manage their imbalance exposure/risk without more clarity on these points.

**Relationship to PIRP:** LSA (and CalWEA) have stated before, and continue to believe, that any PIRP participation limits or phase-out should be geared to implementation of more-flexible scheduling and imbalance provisions that would enable VERs to obtain equivalent imbalance protection through alternative market mechanisms. PIRP should not be limited until such provisions have been implemented and shown to work in this respect.

Depending on the information provided above, the timing and other market modifications in the Proposal might be sufficient to justify PIRP changes. However, the information provided thus far is not sufficient to make such a determination.