

California Independent System Operator Renewable Integration: Market and Product Review Phase 2

Comments of the California Wind Energy Association
on the April 5, 2011 Discussion and Scoping Paper

April 29, 2011

I. Introduction

The California Wind Energy Association (CalWEA) is pleased to offer the following comments on the California Independent System Operator's discussion and scoping paper "Renewable Integration: Market and Product Review Phase 2" (RI-MPR). The CAISO drafted this paper to stimulate stakeholder discussion of potential changes to the CAISO's wholesale market design, including new products and revisions to market rules, that may help to integrate the increasing amounts of renewable energy resources, including wind generation, that will be brought on-line in California over the next decade. CalWEA understands that the CAISO would like Phase 2 of RI-MPR to develop a comprehensive "road-map" for the market changes that need to be adopted in the next several years to accommodate the increasing amounts of renewable generation. This phase also could identify specific market design changes that the CAISO should pursue in the near term (i.e. in 2012).

The general direction of the changes to its market design that the CAISO has proposed is to increase the operational flexibility of the generation on the CAISO-controlled grid. CalWEA appreciates the importance of this goal if a 33% renewables portfolio is to be integrated successfully on the CAISO system.

II. Specific Comments on the CAISO's RI-MPR Proposals

CalWEA has prepared the attached matrix showing the CAISO's specific market design issues and the new products that the CAISO has considered, with CalWEA's initial comments on each. Where possible, CalWEA has provided its assessment of the feasibility, utility, and priority of each issue or product. We hope that these comments will help the CAISO to decide which of these changes are the most promising to pursue. We address separately in Section III below Section 2.4 of the CAISO paper discussing the allocation of integration costs.

III. Allocation of Integration Costs (Section 2.4)

The CAISO's issue paper poses a series of questions about allocating the perceived cost of integrating variable energy resources (VERs) to these resources. These questions are:

- Which specific integration costs should be allocated to VER?
- How should the CAISO determine the relative shares of the costs charged to demand versus those charged directly to VERs?

- Should cost allocation be based simply on resource categories (e.g., technology, PMax), or should it be based on measured performance of each resource?
- For performance-based cost allocation, should the integration costs then be allocated to all resources?
- Should some of integration costs also be allocated through the generation interconnection process (GIP)?
- Should integration costs apply differently to imports?

CalWEA questions the wisdom of heading down this difficult and possibly contentious path at this point in time. Fundamentally, we believe that the discussion of this topic will only distract from what should be our main effort: to develop the technical solution to address the integration needs of the CAISO system. Only after the technical solutions are known and some combination of the market reforms enumerated above have been selected, will the industry have some grasp of what integration costs actually are, how they are caused, and to whom they should be allocated. We have reviewed and support the similar comments that the Vote Solar Initiative has prepared on this issue.

Before any of the above questions are addressed, CalWEA submits that an even more basic set of questions must be addressed. These can be summarized as, first, "are we ready today to determine and allocate integration costs to VERs?" Presuming the answer to this first question is "yes," then we need to ask "what would be the purpose and benefits of doing so?" Before the CAISO and stakeholders spend time addressing the questions on cost allocation posed in the issues paper, the CAISO should answer the following:

- **Are existing models of a 33% RPS adequate to project integration costs accurately?** Based on the experience to date with the modeling in the CPUC's Long-term Procurement Proceeding (LTPP), R. 10-05-006, the answer to this question is clearly "no." That assessment in no way denigrates the important and illuminating work that has been accomplished in the LTPP case. However, that effort has shown that the state of the art for calculating integration costs, let alone for allocating them, is so undeveloped that any effort to forecast and allocate integration costs will be highly inaccurate. If there has been any consensus in the LTPP case, it is that the modeling of integration costs remains a work in progress, that the focus today should be on improving our ability to model these costs, and that current models are not ready to be used as the basis for significant resource procurement decisions. The CAISO itself has called for the CPUC to focus on developing the tools to analyze integration issues and to adopt only "the minimum measures that must be taken now to allow for the process to mature and evolve" over the next decade.¹ In a similar vein, Southern California Edison has warned that existing models should be used for no more than the development of "a least regrets" set of actions that can be undertaken now, in the face of substantial uncertainty, because they appear necessary under a wide range of assumptions and have a relatively limited

¹ CAISO September 21, 2010 Comments in CPUC Docket R. 10-05-006, at 4.

potential for creating stranded investment.² If it is uncertain whether these costs can be forecasted and allocated accurately today, we question whether there is any reason to undertake the exercise outlined in Section 2.4 of the issues paper.

- **Would this effort raise issues of whether renewable resources are being treated in a discriminatory fashion compared to “conventional” resources?** The answer to this question is “yes.” CalWEA notes that the cost of operating and contingency reserve services that are procured due to the forced outages of “conventional” resources historically have not been calculated or assigned to those resources. If integration costs are assigned to VERs, then VERs should be assigned only those costs in excess of the integration costs which are now socialized for conventional resources. This will further complicate the analysis, as the integration costs for conventional resources also will need to be determined using a methodology that does not discriminate unfairly against any type of resource.
- **Will this exercise reduce ratepayer costs?** No. In fact, it is likely to increase them. If integration costs are assigned directly to VERs, the generators will pass these costs through to the utilities and their ratepayers in the form of higher prices for renewable energy. Given the uncertainties and the issues of accuracy and discrimination that exist today in the calculation of integration costs, generators are likely to inflate their bids to compensate for the additional risks that projects will bear from this new, uncertain cost component. The result will be higher costs for ratepayers than if the CAISO socializes these costs for assignment to all ratepayers through the utilities, as it does today with the integration costs for conventional resources.
- **Is the allocation of integration costs to VERs the best way to stimulate the development of improved processes and technologies to reduce renewable integration costs?** Again, the answer is almost certainly “no.” It might make sense to allocate renewable integration costs to generators if those generators were the entities in the best position to minimize integration costs. For example, if a low-cost, low-impact distributed storage technology were available that allowed wind generators to store their output on-site and to dispatch it to the grid when needed, it would make sense for integration costs to be assigned to VERs in such a way that generators would have an incentive to install the storage technology in order to avoid such costs. This would also allow the CAISO to continue to operate the grid in the same manner that it does today. However, no such technology appears to be available or on the horizon. In CalWEA’s view, the most promising approaches to integrating renewables involve (1) exploiting the geographic and temporal diversities of renewable output, (2) improving the forecasting of renewable output on a grid-wide basis, and (3) enhancing the operational flexibility of the grid, including the development of new storage capacity³ and of new market mechanisms

² SCE September 21, 2010 Comments in CPUC Docket R. 10-05-006, at 3. SCE’s idea of a “least regrets” policy is that procurement choices related to renewables integration should be made over a number of LTPP cycles, in a manner that retains flexibility and does not compromise either reliability or RPS compliance.

³ CalWEA believes that the most beneficial location for storage capacity on the electric system is as close to load as possible, because that will maximize the value of storage output dispatched to meet peak demand needs. Storage

to compensate generators that can provide enhanced flexibility. This places the CAISO, as the system operator, in the key position as the entity that is best placed to minimize the costs of integrating renewables. The task is challenging, but CalWEA is confident that the CAISO will be able to handle it, and believes that the ideas presented in the RI-MPR discussion paper represent an important milestone for the CAISO as a central player in advancing California's path-breaking renewable goals.

- **Will allocating integration costs improve resource choices?** Probably not. Given the statutory mandate for a 33% renewable portfolio, plus the provision in the new RPS legislation that moves away from the use of a fossil resource (the MPR) as the cost benchmark for the RPS portfolio, it is unlikely that allocating integration costs will result in the substitution of fossil generation for some portion of the 33% RPS portfolio, even if integration costs prove to be high. If integration cost allocations differ among the various renewable technologies, it is possible that this assignment could influence the composition of the 33% RPS portfolio through the Least Cost Best Fit (LCBF) procurement process (by affecting the bid price, in which case the use of an integration-cost adder in the LCBF bid evaluation process would be duplicative). However, it is questionable whether our ability to model integration costs is advanced enough to perform this technology-specific allocation accurately. As a result, given the state of our knowledge and expertise today, the development and assignment of integration costs is unlikely to increase the efficiency of the market for renewable energy.

CalWEA appreciates the CAISO's consideration of these comments on the RI-MPR Phase 2 issue paper, and looks forward to working with the CAISO to further develop the important market reforms and initiatives that will help to increase the operating flexibility of the resources attached to the CAISO-controlled grid.

Submitted on behalf of CalWEA by

R. Thomas Beach
Crossborder Energy for CalWEA

Darius Shirmohammadi
California Wind Energy Association

sited at the location of generation may have considerably less value, because transmission constraints may prevent the stored energy from being deliverable to loads during peak periods.

CalWEA Position on CAISO Issue Paper on Phase 2 Market Product and Review

April 29, 2011

Proposed Market Reform Element	Description	CalWEA Position
Hourly Contingency Only Election – this is an enhancement of an existing market protocol	Allow resources offering/providing operating reserves (spin/non-spin) to make contingency-only dispatch election on hourly rather than daily basis.	CalWEA sees this feature increasing the pool of resources providing system flexibility particularly during morning and evening ramp hours where overall load is low and such flexibility is needed. Hence, assuming that the cost of implementing this market feature enhancement will be low, we recommend that CAISO implement this feature as early as possible.
Multi-settlement System for Ancillary Services (A/S) - enhancement of an existing market protocol	Procure A/S (including regulation) closer to real-time through a multiple (3 in this case) settlement system instead of procuring all expected A/S in DA.	CalWEA sees meaningful benefits in this feature as it allows for a bigger pool of system flexibility resources to be available closer to real time and also allows for more accurate and cost effective procurement of the actual system flexibility needs.
	Allow the buyback of A/S awarded in DA market (enhancement of an existing market protocol).	CalWEA sees some benefit in this feature in potentially increasing the pool of system flexibility resources and reducing the overall cost of A/S and system flexibility procurement.
RUC enhancements - enhancement of an existing market protocol	Better account for potential CAISO forecast error	CalWEA believes the IFM & RUC must be fundamentally changed not only to address the integration of renewables but also to deal with the changing characteristics of the “conventional” resources and the inevitable and large scale addition of fast response storage and demand response resources. We believe that rather than running a single IFM and a single RUC in DA timeframe, the bulk of market activities should migrate towards multiple Day-Of (DO) markets consisting of combined IFM/RUC runs each for a few hours (the number of hours could be flexible) for the day of operation. This change, which will require a three settlement system if the DA market is still retained, will better ensure that only the needed resources will be committed for operation as it relies on the more up-to-date forecast of demand values and VERs’ output. Of course, if the addition of a three settlement system will prove to be too onerous, we recommend that the multiple DO markets (up to 6) replace the DA market. We also believe that two features need to be added to the commitment process: 1) accounting for ramping capability of “conventional,” storage-based, and VER resources; and 2) accounting for the probabilistic nature of system performance (this feature may be considered for implementation in the longer term).
	Add ramping needs to the RUC commitment process	
	Combine IFM and RUC	

Proposed Market Reform Element	Description	CalWEA Position
Pay-for-performance Regulation payments - this will be a new market protocol	Differentiate between regulation resources based on their ability to provide faster response to the CAISO’s regulation signal, by dividing the payment for regulation into a capacity payment and a performance (mileage) payment	CalWEA supports this differentiation in determining payments to resources, based on their ability to provide the most responsive regulation services. However, we believe that such differentiation should only be made when needed – say, for the morning and evening system ramp hours. At the same time, we believe that the implementation of ramp requirement in the IFM/RUC as well as a more careful review of the system dispatch function for morning and evening system ramp periods (by more carefully selecting the target value for system dispatch) can reduce the need for regulation services as well as ramping performance for such resources.
	Make regulation payment (capacity portion) contingent on the availability of a certain amount of stored energy	CalWEA believes that it only makes sense to pay for a service on the condition of the payee’s ability to provide that service.
	Account for the opportunity cost of providing regulation service	CalWEA fully agrees with this position. In this regard, we believe that if a VER offers and it is selected to provide regulation services, it should be able to include and then get paid for its opportunity cost in terms of the lost energy payment when providing regulation services.
Load-following reserve - new market protocol	Introduce Load Following service and pay for resources to maintain unloaded upward capability & unconstrained downward capability.	CalWEA does not believe that such a reserve service is needed, provided that the CAISO undertakes the following: (1) addition of multiple “Day-Of” (DO) IFM/RUC, which we consider to be essential, (2) the requirement for certain ramping capability in the combined IFM/RUC, (3) improvements in the dispatch mechanism during morning and evening system ramps, and finally (4) differentiating the performance (mileage) payment for regulation service. As a matter of record, we recall that the CAISO at one time did procure a service called “Supplemental Energy Reserve” that was effectively intended to provide this load following capability and then walked away from it.

Proposed Market Reform Element	Description	CalWEA Position
System inertia & frequency response - new market protocol	Provide inertia to avoid post contingency underfrequency conditions	<p>On a theoretical level, CalWEA understands CAISO’s concerns with the potential lack of sufficient inertia in the CAISO/WECC system in the future. CalWEA also understands that what CAISO needs is “post contingency frequency response” and not necessarily additional mechanical inertia mostly from conventional generating units. First, we want to remind CAISO that motor loads also provide mechanical inertia response and that is almost always ignored in post transient studies. Second, CalWEA believes that before the CAISO calls for any additional post contingency frequency response or assigns the responsibility for providing such capability to any class of resources such as VERs, the CAISO should undertake proper studies to determine whether there actually exists a lack of sufficient post contingency frequency response in the CAISO/WECC system and if such a condition actually exists, what are the underlying reasons for it. Third, should it become necessary for VERs to help with providing post contingency frequency response, the CAISO should allow sufficient time for the industry to develop the needed technologies on commercial basis – say, at least via three independent vendors. We believe that similar capability could be more efficiently attained centrally from fast response storage and demand response resources. Finally, the CAISO should consider establishing incentives for provision of post contingency frequency response by VERs and other system resources.</p>
Flexible ramping constraint - new market protocol	Already-planned enhancement to add System Ramping Constraint (SRC) to Real-Time Predispatch (RTPD) to ensure sufficient ramping to account for forecast errors	<p>CalWEA believes that the implementation of more fundamental improvements in the areas of DO IFM/RUC with resource ramp requirements and procurement of more responsive regulation services would obviate the need for this feature. However, if the CAISO can readily and inexpensively implement this feature as an interim measure before more fundamental enhancements are placed in operation, we would not have any concerns with it.</p>

Proposed Market Reform Element	Description	CalWEA Position
Better Price Signals for Meeting Operational Needs - new market protocol	CAISO is seeking an expansive set of market changes intended to pay for the services that are typically used to deal with system reliability constraints based potentially on the “shadow” price of such constraints. At this time these services are neither paid for marginally nor separately. They are rather covered as part of a general average payment such as the bid cost recovery payment.	The market changes contemplated here are still theoretical and complex in nature, their impacts on the overall market efficiency and reliability are vague and their benefits for renewable integration are unproven. CalWEA believes that we should focus our attention on the real and impactful major market reform initiatives discussed ABOVE and only turn our attention to these topics after these more timely and impactful market reforms have been implemented and their impacts understood.
Full Hour Ahead (HA) Market - new market protocol	CAISO to re-introduce an HA market and as a result a three settlement system that they scrapped as part of the MRTU implementation – this time the HA market would include energy, A/S and congestion management.	CalWEA believes that re-introduction of HA market is a major positive step and will go a long way to increase the efficiency and reliability of both the market and system operation in light of the predicted proliferation of VERs as well as fast start “conventional,” storage and demand response resources. However, before implementing 24 hourly markets, we recommend that the CAISO consider implementing four to six multi-hour Day-Of (DO) markets, as we broadly presented above, plus the 15 minute market presented below. A migration from DO to HA market should be straightforward if it is needed. And as we noted before, DO markets could completely obviate the need for the DA market.
15 minute Market in Real-Time - new market protocol	CAISO would allow scheduling of all types of supply and demand resources for a 15 minute interval RT markets. This market would replace the HASP.	CalWEA supports any market facility that will allow the more-frequent provision of shorter-time-interval resource schedules closer to the real-time operation. While the details of the CAISO proposal are not clear to us, we are very interested in further discussing this market option.
Uneconomic Adjustment Priority for VERs – new market protocol	When dealing with resource adjustments without economic signals, adjust “conventional” resources ahead of VERS	CalWEA supports the protocols that would adjust conventional resources ahead of VERs under the circumstances where ALL market resources (resources with price signals) have already been adjusted to mitigate the congestion. We make this point since the adjustment of VERs, in addition to the loss of environmental benefits, will have severe economic and financing consequences for these resources. Once the adjustment of “conventional” resources under these conditions is no longer possible and more resource adjustments are still required, we see the merits of adjusting EO VERs ahead of FC VERs; although we would like to further understand and discuss this latter point with the CAISO.

Proposed Market Reform Element	Description	CalWEA Position
CAISO Run Capacity Market – new market protocol	CAISO to introduce long-term (multi-year) capacity and reserve markets	CalWEA is unsure whether this very “generic” market reform proposal will play any meaningful role in facilitating the integration of renewables. That said, we are ready to engage in a discussion of the potential purposes and benefits of such markets before taking a position.