Stakeholder Comments Template

RI Phase 2 – Day-of Market 7/6/11 Initial Straw Proposal

Submitted by	Company	Date Submitted
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Xtreme Power, Inc. (XP) designs, engineers, manufactures and operates Dynamic Power Resource™ (DPRs™), integrated energy storage and power management systems for Independent Power Producers, Transmission and Distribution Utilities and Commercial & Industrial End Users, among others. XP appreciates the opportunity to comment on the CAISO's ***"Initial Straw Proposal – Market Vision & Roadmap/Day-of Market"*** ("Proposal") and the discussion at the July 7th stakeholder meeting about the Proposal.

The Proposal is the second part of the CAISO's Renewables Integration – Market and Product Review ("RI-MPR2") initiative and contains: (1) proposed enhancements to the CAISO Real-Time Market (RTM); and (2) a stated intention to develop a longer-term "vision" and "roadmap" for forward-market enhancements in the future.

Xtreme Power's DPR™, and other types of Limited Energy Storage Resources (LESRs) provide Regulation by rapidly injecting and withdrawing power from the grid to follow moment-by-moment demand and frequency changes. XP's technology can respond with full up or down power in less than a second after receiving a CAISO control signal. By comparison, the CAISO allows generators in its current Ancillary Services (A/S) markets, including the Regulation market, up to 10 minutes (600 seconds) to ramp to full power.

Xtreme Power supports the CAISO's efforts to redefine the Regulation product to enable the ISO Operators to efficiently and reliably operate the grid with a more diverse and variable supply portfolio and change the compensation structure for both Regulation and RTIS to "pay-for-performance", by including a mileage payment.

1. Please provide any comments on the ISO's proposed schedule, timeline, or process for this stakeholder process.

   Xtreme Power supports the CAISO's efforts regarding the steps that the ISO is taking to fully utilize the capability of fast-ramping technologies and to implement pay-for performance. However we are concerned with the length of time to implement these changes (i.e. 2014-2015).

   The CAISO 20% Renewable Portfolio Standard study showed significant need for additional Regulation capacity and ramp-rate in order to integrate 20% and 33%

renewable resources. For example the maximum Regulation Up requirement for summer in 2006, 2012, and 2020 is expected to be 278 MW, 455 MW, and 1444 MW, respectively. Similarly, the maximum Regulation Up ramp-rate for summer in 2006, 2012, and 2020 is expected to be 75 MW/min, 118 MW/min, and 528 MW/min, respectively.

In order to encourage faster ramping capability into the market – through improvements to the Regulation response of existing resources and/or entry by new, fast Regulation resources – then it should immediately structure its Regulation payments to pay for that capability and change its Regulation dispatch to take advantage of fast-ramping resources.

2. Are there additional goals or operational challenges that the ISO should be addressing through this stakeholder process?

   *Has the CAISO considered applicable testing requirements for resources that will be participating in the RI*M?

3. Please indicate whether your organization agrees with the guiding principles listed in the straw proposal. If not, please indicate why not. If you would like to have other guiding principles added, please describe those additional principles.

   Xtreme Power fully supports the guiding principles listed in the straw proposal.

4. Please provide your organization's views on any incremental ancillary services you believe are necessary to accommodate the intermittency of renewable resources.

   XP believes the increased variability caused by intermittent resources will require additional ancillary services quantities and products. Additional Ancillary Service products should be carefully introduced with the consideration of implementation feasibility & cost.

5. Does your organization believe that Residual Unit Commitment should be performed more granularly than daily (i.e. on-demand RUC)? Is on-demand RUC needed if the 15 minute unit commitment, either in RTED (Option A) or RTPD (Option B) looks forward 8-10 hours?

   Xtreme Power is concerned that RUC more frequently than daily, ("on-demand") can bring on-line more supply, and incur additional fixed costs, than are needed to solve the reliability need. Where fixed costs are not included in LMP, market prices will not include the costs that will be carried for the units committed. There may be more distortions to the market from on-demand RUC than can be anticipated.

   We believe that the RUC process is a tool to be used by the ISO when the previous economic dispatch solution does not commit a sufficient amount of resources to

meet the requirements for online availability. The changes and additions proposed to the Ancillary Services markets in the Straw proposal should serve to provide additional capacity and fast-response capability in the Day-Of market. We believe that these market tools should first and foremost be allowed to solve within-day capacity requirements - the introduction of further RUC processes and associated costs should only need to be considered if least-cost dispatch of Ancillary Service solutions fails to provide the required capability. In addition, the additional flexibility envisaged available in the Ancillary Services market should limit the requirement to commit as many units under the existing Short-term Unit commitment for the purposes of managing ramp shortages.

A further consideration in any new RUC commitment process is the requirement for decommitment of resources to manage variability in expected generation. The mechanism and potential cost-adders for a RUC decommitment would also need to be considered in the evaluation of any new RUC process intended to manage variable output – again, we believe that structuring the Energy and Ancillary Services dispatch model to economically address this requirement in the first instance would be the preferred approach.

6. Does your organization prefer a two settlement market or a three settlement market? Please describe why.

At this time, Xtreme Power prefers the current two-market settlement system as we believe like the CAISO, that the complication of adding a third settlement market would create significant issues without providing clear benefits. If benefits are made more transparent, we might reconsider this position.

7. Please provide your organization's feedback on the concept of a 1 minute Real Time Imbalance Service (RTIS).

XP welcomes the CAISO efforts to support greater participation of flexible resources on the system – this capability is key to supporting increased integration of variable output generation on the grid.

In theory, a flexible 1-minute response service should help manage the effects of unscheduled changes in generation – however, without understanding in greater detail exactly how the new RTIS product would be procured and implemented, it is not clear if RTIS as proposed is the most suitable approach and therefore we cannot fully comment on its feasibility at this point – we request that CAISO provide more information in the next stage of the Stakeholder process.

In general, we urge that any RTIS-product intended to increase flexible-response capability is designed such that all capable providers of this service, including LESRs, can fully participate in this market. We believe that a product such as RTIS should only be used to manage deviations within the energy dispatch interval, and therefore should be reset every RTED. If RTIS is dispatched in one direction for a considerable time (for example, more than 30 minutes), the reserve for frequency

regulation may be short - thus RTIS should be energy neutral over all time horizons as much as possible.

a. Does your organization agree that with RTIS, regulation should be changed to a bi-directional service?

Per the key findings of the 20% RPS study, to successfully integrate renewable resources, the ISO will need operational flexibility as there will be a need to frequently mitigate frequency excursions and over-generation conditions. Thus similar to Regulation, we support a RTIS-type product which is considered as ***two separate services*** *(RTIS-Up and RTIS-Down), and suggests that CAISO works to integrate rules for RTIS to be commensurate with the changes to the regulation market rules that are reflective of the pending FERC NOPR issued in February of 2011.*

8. *Please comment on your organization's preference for Option A or Option B with regard to the real time market. If neither option is feasible in your view, please provide input on how the real time market should be configured.*

The process changes and implementation costs required to move to a 15-minute market are significant and there would need to be a clear overall benefit from the proposed rule changes to support this change. In general, the longer the dispatch interval, the more unexpected variability the system is exposed to within the interval – the key to managing this greater exposure is to ensure that the system has a portfolio of fast-responding resources which can quickly and reliably respond to sudden changes in system conditions.

9. *How often should renewable resources be allowed to schedule?*

Xtreme Power believes that resource scheduling should reflect the expected real-time operation of the resource as much as possible, taking into consideration the practical requirements of system dispatch including system processing time, the availability of other system tools to manage changes in schedule, and the ability of resources to respond to new dispatch instructions arising out of schedule changes.

Under either Option A or Option B, the benefits of increasingly tighter schedule windows must be weighed against the costs of incorporating those schedules on the system. Allowing a resource to submit revised schedules on a 15-minute basis if/when there was a material difference in their expected real-time output should result in a more accurate, and thus more efficient, dispatch of energy and ancillary service resources. Key to an efficient redispatch however is to ensure that the system has the tools available to respond to the schedule revisions and/or unexpected changes – reiterating our response under Q9, this means designing market mechanisms to support participation from all capable resources, including storage technology and demand response, which enable the system to handle scheduling revisions as efficiently as possible.