Comments of MegaWatt Storage Farms on CAISO Renewable Integration Market - Product Review Phase 1 - Second Revised Straw Proposal and Call of May 3, 2011

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Thank you for the opportunity to participate on the Renewables Integration Market call on May 3, 2011 and the opportunity to submit written comments.

MegaWatt encourages CAISO to consider storage as a primary grid asset for solving the challenges of renewables integration. We recommend that CAISO design market mechanisms that encourage use of storage as a primary grid asset. By "primary grid asset", we mean considering storage as a resource of at least equivalent importance to other resources such as generation, transmission, and load (including demand response).

California's Loading Order gives further guidance. While storage is not explicitly mentioned by name in the Loading Order, storage has the characteristics of demand / response, since storage can be used to reduce peak demand via timeshifting. Storage's capabilities accordingly rank higher than deployment of new renewables in the Loading Order. We note that any renewables curtailment plan will, of necessity, require deployment of additional renewables in order meet the RPS goals. The Loading Order requires demand / response solutions be applied first. Therefore storage should be considered more desirable than solutions that require deployment of more renewables.

We commented during the call that the market incentives being discussed were targeted to modify the behavior of renewables, but there was no discussion about incentives directed to storage. Storage offers a tremendous way to resolve renewables integration challenges. It can smooth short-term volatility, provide fast-response frequency regulation, deliver gigawatts of ramping, and can timeshift energy from periods of renewable overproduction to periods of high demand.

The incentives that were discussed on the call were often trying to find a delicate balancing point between two powerful opposing forces. The parties on the call were tugging in opposing directions but in ways that were unlikely to result in beneficial movement, much like Dr. Doolittle's Pushmi-Pullyu.

These Pushmi-Pullyu conflicts include the LSE's desire to hit their RPS standards versus CAISO's desire to have an effective curtailment mechanism to manage the renewable integration.

As people mentioned on the call, if CAISO uses curtailment, then more renewables will need to be installed in order for LSE's to hit their RPS goals. These additional renewables will add to the volatility, which leads to even higher curtailment. Simultaneously, RPS goals are rising, which exacerbates the situation. The ever-increasing levels of curtailment will increasingly undermine the economic models of the renewable projects by reducing the capacity utilization of each facility. Project developers need to accurately forecast curtailment across the next 20 years to develop accurate economic models. This is effectively impossible with this type of unstable vicious-circle dynamic of more renewables, rising RPS targets and more curtailment. In such cases, the cycles could grow until the economics fall apart - existing projects fail due to excessive curtailment and money dries up for new deployments. We strongly encourage the CAISO to explicitly model this dynamic and compare it to the stabilizing, self-correcting influence that storage can provide. Metrics that CAISO should assess when modeling the storage scenario and the curtailment scenario include the ability of CAISO to provide reliable power, the ability to hit the rising RPS goals, the ease of system grid management and the overall societal cost.

Another Pushmi-Pullyu example was the extensive discussion of PIRP versus non-PIRP resources, and the associated issues of scheduling and whether resources were entitled to respond to the -$300 / MWh pricing incentive.

Given the above complexities and conflicts, we believe it is a losing battle to solve renewables integration problems and achieve RPS goals by exclusively focusing on incentives for renewables. We strongly encourage CAISO to consider storage as a preferred and stabilizing solution. More broadly, we encourage CAISO to look upon storage as a primary asset in all of CAISO's grid planning activities, including the issues covered by this stakeholder proceeding, and (as noted in other MegaWatt submissions) in transmission planning.

The best way to incentivize storage is through the availability of long term contracts with predictable revenue streams. This allows rapid deployment of large scale storage facilities using project funding or debt. The necessary storage technology is ready and waiting today - the issue is one of providing acceptable revenue streams. AB 2514 was drafted to unlock these revenue streams, although the final form of AB 2514 has left specific storage deployment goals unresolved and thereby suspended deployment of storage. We encourage CAISO to continue their active participation in the CPUC's AB 2514 proceedings. By working closely together, CAISO and the CPUC can enable deployment of sufficient storage to easily handle the above renewables challenges, allowing California to economically and reliably achieve its RPS goals.

To the extent CAISO plans short term incentives (such as boosting the negative price cap from -$30 / MWh to -$300 / MWh or more), please consider storage as a primary grid asset that can be incentivized by these and design them accordingly. Larger negative price caps provide significant benefits to storage, even if the storage is primarily deployed under long term contracts via AB 2514. We strongly recommend symmetric price caps and we would prefer the negative

cap be set at the earlier proposed level of -$1,000 / MWh rather than current proposal of -$300/MWh.