

March 18, 2014

Board of Governors
California Independent System Operator

Via Electronic Mail
SKarpinen@caiso.com

RE: NGK Inc. and MegaWatt Storage Farms Inc. Comments on Flexible Resource Adequacy Criteria and Must-Offer Obligation, Revised Draft Final Proposal

Board of Governors:

MegaWatt Storage Farms, Inc. on the behalf of NGK Inc. (NGK/MegaWatt) submits the following comments to the CAISO Board prior to consideration of the Revised Draft Final Proposal for the Flexible Resource Adequacy Criteria and Must-Offer Obligation.

The Proposal's treatment of storage does not adequately support the state's policy goals expressed by Assembly Bill 2514 that are intended to support the use of clean, fast, flexible storage rather than fossil fuels to integrate variable wind and solar renewable generation. The original AB 2514 bill proposed about 4,000 GW of storage by 2020, but the CPUC's initial plan is for 1,325 MW of storage for the IOUs; the CPUC may consider raising these procurement targets in future proceedings.

The Proposal awards flexible capacity credits to 15-minute storage for a limited amount of frequency regulation and full flexible capacity credits to 45-minute storage for any amount of storage. Multi-hour duration storage would get the same flexible capacity credits as 45-minute storage. A California grid with 1,325 to 4,000 MW of 15-minute and 45-minute storage would miss the mark.

For example, short duration storage is not adequate to support the CAISO's approximately 13,000 MW 3-hour ramping needs in 2020 as indicated by the CAISO "Duck Curve" analysis. Frequency regulation 15-minute storage does not provide any energy to support any ramp. 45-minute storage does not provide enough energy to significantly reduce such a ramp or to shift excess renewable energy from the belly of the duck to the head of the duck.

MegaWatt has suggested for several years a need for about 4,000 MW of 4 or more hours of storage to meet California's needs for renewables integration without over reliance on fossil fuels. The current Proposal for 15-minute and 45-minute storage is clearly inadequate to meet this need. 4000 MW of clean, fast, 4 to 6 hour storage would provide 8,000 MW of mitigation

for the 13,000 MW ramps the CAISO is projecting and shift excess renewable generation from the belly the duck to the head of the duck.

It is clear that much of the focus of this Proposal is on CAISO operations for 2015. However, the Proposal's 15- and 45-minute definitions of flexible capacity storage will influence the procurement of 1325 MW of storage towards short-duration storage; as a result more fossil fuel generation will be needed to integrate renewables, frustrating the objectives of AB 2514 and the state's renewables and carbon reduction objectives.

It is true that the CPUC is responsible for long-run Resource Adequacy Capacity including Flexible Capacity procurement rules. However, as the Proposal states "*the must-offer obligation developed in this stakeholder initiative will serve as a critical input into the CPUC's multi-year forward resource adequacy procurement mechanism.*" Moreover, the CAISO needs to continue to focus on its increasing flexibility needs to 2020 and beyond.

The Opinion of the Market Surveillance Committee (MSC) does not address the storage specific aspects of the Proposal and a careful reading of the Opinion reveals doubt that the overall Proposal will be effective.

NGK/Megawatt therefore suggests that with respect to storage, the Proposal has not yet matured and should be rejected by the CAISO Board.

NGK and MegaWatt appreciate CAISO's work on this Proposal and we look forward to continued cooperation with the CAISO and other parties to improve the Proposal.



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