

Flexible Resource Adequacy Criteria and Must-Offer Obligation Workshop Comments, April 18, 2015

Submitted by	Company	Date Submitted
Edward G. Cazalet MegaWatt Storage Farms, Inc. ed@MegaWattSF.com 650-949-0560	NGK Insulators, Ltd.	August 25, 2015

NGK Insulators, Ltd. (“NGK”) is a large international firm focused on the power, ceramics and electronics businesses www.ngk.co.jp/nas/. NGK is the manufacturer of the NAS battery system that is proven in extensive commercial operation for two decades. Globally, more than 450 MW of commercially proven NAS battery capacity at over 190 locations with 6 to 7 hours of energy storage (over 3000 MWh) are currently in operation and additional large projects are in current development <http://www.ngk.co.jp/english/news/2015/0622.html> . NGK has existing proven manufacturing capacity of more than a GWh per year of storage capacity.

MegaWatt Storage Farms, Inc. (“MegaWatt”) is a storage advisory firm. MegaWatt prepared these comments on behalf of NGK.

NGK and MegaWatt commend the CAISO on this initiative to revisit its proposals for flexible resource adequacy, including consideration of the flexibility that can be provided by electricity storage projects.

NGK’s and MegaWatt’s comments are generally applicable to most multi-hour battery and other fast, multi-hour storage and two-way hybrid technologies.

COMMENTS

In previous comments, NGK/MegaWatt has said that the primary focus of this effort needs to be on raising the mid-day “belly of the duck” and lowering the evening “head of the duck” http://www.caiso.com/Documents/NGKComments_ReliabilityServices_FlexibleRACriteria_MustOfferObligations_Phase2IssuePaper.pdf. So far the CAISO appears to have ignored our previous comments.

Resource adequacy needs to focus on moving many GWH of mostly solar generation from mid-day to the evening peaks as well as to respond to fast ramps up and down, while reducing greenhouse gas (GHG) emissions. There are two alternatives (1) shift some end use loads from mid-day to the evening or (2) employ energy storage with sufficient energy storage capacity and fast ramping, charge and discharge capacity. Given that the Legislature and CPUC have no plans for fully transactive retail markets, the importance of the second alternative, long-duration energy storage (LDES), is evident.

It is also evident that large-scale deployment of storage is feasible and economic. This conclusion is supported by the significant amount of storage that is in the CAISO interconnection queues; the huge responses to the IOU storage RFOs; the declining prices of storage; and the availability of proven storage manufacturing capacity.

A study by E3 (https://ethree.com/documents/E3_Storage_Valuation_Final_Phase_1.pdf) has shown that many GW of 6-hour or more LDES, or its equivalent, will be needed to raise the “belly of the duck” and reduce over generation with less curtailment of solar. The current CAISO studies confirm this need.

The current flexible capacity product is constrained by historical definitions of Net Qualifying Capacity (NQC) as described in the Issues Paper. NQC is a one-way, 4-hour, 3 days in a row, peaking product. This NQC product is increasingly irrelevant to the CASIO needs and should not constrain the definition of the flexible capacity product.

The CAISO is now proposing inflexible capacity allowances created by resources that have downward dispatch capability. However, there is no mention of how many hours per MW of downward dispatch capability will be required. It is clear from the shape of the duck curves that the downward dispatch capability for inflexible allowances, whether from electric vehicle charging, load increase, or storage charging must be for 6 or more hours in order to shift the over generation to the “head of the duck”. MWH of downward flexibility matter more than MW of downward flexibility in mitigating over generation and waste of renewable energy.

This flexible resource adequacy initiative has been overly emphasizing must offer requirements for fossil generators to reduce self-scheduling at the expense of addressing the over generation problem. Self-scheduling can be the result of many factors and the CAISO has stated that it does not completely understand the reasons for self-scheduling. As more distributed energy resources, variable renewables and storage enter the market then centralized dispatch by the CAISO cannot adequately account for all of the constraints, multiple uses, and current states of all such resources. Coordination by the CASIO using pricing of self-dispatch by the operators of such resources by the CAISO via pricing will be a better approach. The CAISO needs to admit that participants have good reasons to self-dispatch and self-schedule and that they may better respond to priced firm offers to provide services to the CAISO and other parties while they remain in full control of their resources.

RECOMMENDATIONS

NGK and MegaWatt recommend refocusing this Flexible Resource Adequacy initiative on two-way, fast ramp, long-duration energy capacity that can raise the “belly of the duck” and lower the “head of the duck”.

Minor modifications of the current formulas for Effective Flexible Capacity (EFC) that depend on 4-hour NQC and a 3-hour ramp will not address the need to shift many GWH of mid-day overgeneration to the evening peaks.

NGK/MegaWatt has previously suggested that Effective Flexible Capacity be defined by an *idealized storage product* with at least 6-hours of two-way, dispatchable energy storage at full rated discharge and charge capacity. Flexible RA requirements can be based on this idealized capacity. The capability of actual storage projects of any duration and non-storage products including generation and demand response can be rated against the capability of this idealized storage product.

In summary a substantial refocus of this initiative, as recommended here, is needed to properly address the flexible resource adequacy needs of the CAISO and California.