Comments by Emerald City Solar, LLC

Energy Storage and Distributed Energy Resources (ESDER) Phase 4

This template has been created for submission of stakeholder comments on the Revised Straw Proposal for ESDER Phase 4. The paper, stakeholder meeting presentation, and all information related to this initiative is located on the initiative webpage.

Upon completion of this template, please submit it to initiativecomments@caiso.com. Submissions are requested by close of business **November 12, 2019.**

Submitted by	Organization	Date Submitted
Tom Rose, Governmental Policy and Regulatory Advisor	*Emerald City Solar, LLC*	*11-12-2019*

Please provide your organization's general comments on the following issues and answers to specific requests.

Emerald City Solar is developing a new solar energy production + storage facility near Yuma, Arizona, and is planning to sell energy and ancillary services in the CAISO market. We support the efforts of the California Independent System Operator's (CAISO) energy storage and distributed energy resources (ESDER) initiative to lower barriers and enhance the ability of these resources to participate in CAISO's market, and are pleased to offer our thoughts on the ESDER Working Group's October 21, 2019 Revised Straw Proposal.

Emerald City Solar is generally supportive of the Straw Proposal, although we are concerned about its focus on "battery" storage only. This Straw Proposal doesn't seem to consider other types of electric energy storage technologies.

Since Emerald City Solar is evaluating the use of Kinetic Flywheel Storage technology in addition to battery storage at our facility, multiple types of storage should be considered by this Straw Proposal. We believe that flywheel storage technology could provide a better technology for frequency regulation services, where numerous charge/discharge cycles are necessary and not an issue for flywheels to provide.

1. **End-of hour state-of-charge proposal**

Emerald City Solar is concerned that trying to create Min/Max values for storage over an entire hour is not realistic for energy storage resources. So, having visibility into the "end-of-hour state of charge only" could be problematic. As you know, storage technologies

can cycle many times an hour, if not instant by instant for flywheels, which is the reason they are valuable in bulk power systems with significant variable renewable generation, like CAISO. While end-of-hour state of charge is useful to the grid operator within the current operating system, we suggest that you consider 5- or 15- minute state of charge proposals for storage resources to capture the more frequent charge/discharge cycles.

2. **Discussion of end-of-day state-of-charge**

No comments at this time.

3. **Market power mitigation for storage resources**

Emerald City Solar is struggling to figure out how "market power mitigation" for storage resources is needed, especially this early in the development of this unique resource for reliable electric grid operation. Storage is not generation (i.e. net consumer of electricity) and therefore should not be viewed through the same lens.

The very definition of market power – "ability to raise and maintain price above a level that would prevail under competition" [emphasis added] – would exclude a short-term energy resource like storage. Historically, the ability to store a commodity on a short-term basis has not been considered with evaluating market power. We recommend that CAISO remove this issue from this proceeding until later, if at all.

4. **Variable output demand response**

No comments at this time.

5. **Parameters to reflect demand response operational characteristics**

No comments at this time.

6. **Removing consideration of non-24x7 settlement of behind the meter resources under DER aggregation model**

No comments at this time.

7. **Additional comments**

Please offer any other feedback your organization would like to provide from the topics discussed during the working group meeting.

Since Emerald City Solar is evaluating multiple types of electric energy storage for its facility, we request that the ESDER Straw Proposal consider storage technologies other than batteries, including kinetic flywheel storage.

Clearly, storage technologies will have different operating and pricing characteristics. For instance, Li-Ion batteries slowly degrade over time as the unit is cycled, while kinetic flywheels don't degrade over time.

In addition, it is likely that flywheel storage can closely follow and quickly respond to frequency changes in the network. However, providing this service to improve system frequency could require more rapid charging/discharging times than is healthy for chemical batteries. Putting rigid restrictions on charging schedules could actually reduce grid reliability, not improve it.

Sincerely,

A HOLISTIC APPROACH TO ENERGY PRODUCTION AND ENERGY STORAGE

Tom Rose
Government Policy and Regulatory Affairs Advisor
tom.rose@emeraldcitysolar.net
Tel: 305.424.8704
Fax: 888.212.9230
Cell: 214.717.1997
2141 NW 1st Place
Boca Raton, FL 33431
www.emeraldskyline.com