

Stakeholder Comments

Submitted by	Company	Date Submitted
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CESA appreciates this opportunity to submit comments on the 2018 Interconnection Process Enhancements (IPE) Straw Proposal and supports the efforts by the California Independent System Operator (CAISO) to continue to work with stakeholders to clarify, improve, and streamline the resource interconnection study process.

CESA also appreciates the CAISO's re-consideration of our February 7, 2018 comments on the Issue Paper, particularly around clarity around processes for replacing entire existing generator facilities with energy storage. Given the policy and market forces driving surplus and/or potentially available interconnection capacity from existing generator facilities, CESA believes that providing additional clarifications and potential supplemental interconnection processes creates a pathway for energy storage resources to be brought online while delivering significant ratepayer savings and value.

4. Deliverability

4.1 Transmission Plan Deliverability Allocation

CESA has no comment at this time.

4.2 Balance Sheet Financing

CESA has no comment at this time.

4.3 Participating in the Annual Full Capacity Deliverability Option

CESA has no comment at this time.

4.4 Change in Deliverability Status to Energy Only

CESA has no comment at this time.

4.5 Energy Only Projects' Ability to Re-enter the CAISO Queue for Full Capacity

CESA has no comment at this time.

4.6 Options to Transfer Deliverability

CESA has no comment at this time.

5. Energy Storage

5.2 Replacing Entire Existing Generator Facilities with Storage

CESA appreciates the CAISO's consideration of our comments on the Issue Paper around providing greater clarity and transparency on 'repower-and-replace scenarios' – *i.e.*, one where existing generation facilities are repowered in part with energy storage systems and the existing generation facilities are subsequently retired. While the CAISO's Business Practice Manuals (BPMs) address various repowering scenarios, CESA observed that the current BPMs do not always provide clarity on pathways, such as through the material modification process, for the aforementioned repower-and-replace scenarios. Specifically, CESA raised ideas for the CAISO to consider in developing the study and interconnection processes for these scenarios:

- Consider whether the criteria for *de minimus* impact for repowering existing generation facilities with energy storage could apply to the criteria for *de minimus* impact for keeping the energy storage system online even as the original generation facilities retire.
- Consider whether the same fuel source requirement for repowering existing generation facilities with energy storage is necessary for keeping the energy storage system online even as the original generation facilities retire – *i.e.*, allowing energy storage to charge from the grid without a full cluster study review of load impacts.
- Consider whether and how deliverability transfers can occur when repowered energy storage systems remain online even as the original generation facilities retire.

CESA thus thanks the CAISO for reassessing these important and timely issues and determining that they remain outstanding issues that requires the BPM(s) to be revised and/or expanded to define better guidelines or "rules of thumb", including in relation to the ideas above.

Reliability Assessment

In the Straw Proposal, the CAISO explains that the repowered energy storage component would need to undergo a reliability assessment to determine whether there is a reliability issue and whether deliverability can be transferred from the retiring unit to the energy storage systems, since repowered energy storage is, in these cases, usually interconnected as energy-only resources at the time of repowering.¹ CESA seeks to work closely with the CAISO in this initiative to understand what this reliability assessment may entail and understand the "electrical characteristics" of inverter-based technologies such as energy storage, which the CAISO notes as being substantially different from that of synchronous generators such as gas generators that are capable of providing inertial response and

¹ Straw Proposal, p. 27.

voltage support.^{2 3} In particular, in this initiative, CESA hopes to work with the CAISO to understand how energy storage systems can provide “synthetic inertia” that replicates the inertial response of the rotating mass from the gas generation it intends to replace. Due to the fast response and ramp rates of battery storage systems, for example, CESA believes that many of these electrical characteristics can be replicated to a certain degree if certain conditions are met (*e.g.*, defined response characteristics, quick detection of faults and frequency deviations).⁴ Of course, this may still require a reliability assessment, perhaps through a material modification process, as the CAISO explains. Additionally, this may also require new provisions (*e.g.*, state of charge and minimal energy requirements similar to how synchronous generators have minimum loading levels) in the interconnection agreement for the repowered energy storage resource to ensure that synthetic inertial response is provided, which is automatically provided synchronous generators.

At the same time, CESA notes that repowering of existing generation facilities with energy storage systems does not only involve battery storage systems but also other non-battery energy storage systems, such as thermal energy storage, compressed air energy storage (CAES) and liquid air energy storage (LAES), that have many of the same properties as synchronous generators, including inertial response. Repowering of existing generation facilities with such energy storage systems may reduce many of the reliability concerns that the CAISO has with energy storage systems remaining online following the retirement of a synchronous generator. When such energy storage systems are used to repower existing generation facilities, and even possibly paired with complementary battery storage systems, that may address many of the reliability concerns of the CAISO in keeping a standalone energy storage resource online without the original generation facility that is decommissioned or retired.

CESA understands that inertial response is only one component of the electrical characteristics for considering whether the repowered energy storage system materially affects the transmission grid’s reliability when the generation unit retires. For example, voltage support is another grid service that can be provided by repowered energy storage resources. However, as the CAISO has noted in the Issue Paper and Straw Proposal, short circuit duty is a grid service that may not be sufficiently provided by inverter-based technologies such as energy storage at this time,⁵ which may present reliability issues if the existing generation facilities are retired. While this is an important criteria in the CAISO’s reliability assessment for repowering requests, CESA seeks to understand and explore whether provisions in interconnection agreements can be developed to allow for the provision of short circuit duty by alternative sources such as synchronous condensers where the costs could be borne by the remaining

² *Ibid*, p. 26.

³ CESA notes that CAISO and FERC policies are requiring voltage support capabilities and ‘D-curves’ from inverter-based resources. These and other applicable changes should inform the extent to which additional studies are appropriate or necessary.

⁴ *Batteries Beyond the Spin: The dawning era of digital inertia on the Island of Ireland*, an Everoze report commissioned by AES, drawing on research by Queen’s University Belfast, October 2017.

http://s2.q4cdn.com/601666628/files/doc_presentations/2017/Everoze-Batteries-Beyond-the-Spin.pdf

⁵ While battery storage systems are generally not capable of providing short circuit duty at this time, CESA understands that some energy storage providers are researching how new power electronic components of battery storage systems can increase their short circuit power to be able to detect short circuit events.

energy storage system if needed. In the California Public Utilities Commission (CPUC) decision to reject the refurbishment of the Ellwood Contract, Southern California Edison (SCE) noted that it demonstrated the import of short circuit duty solutions in case of a N-2 contingency in the Santa Barbara and Goleta areas,⁶ which CESA interprets as potentially allowing for the provision of short circuit duty from alternative sources even as a retiring generation unit no longer directly provides short circuit duty. Given this, CESA requests clarification on whether interconnection studies have already modeled contingencies in drafting and issuing interconnection agreements, wherein provisions are in place to address grid needs identified in interconnection studies (*i.e.*, “make the grid whole”) if certain contingencies (*e.g.*, insufficient short circuit duty) take place. If so, CESA hopes to explore whether repowered energy storage can indirectly provide, ensure, and possibly procure short circuit duty through alternative sources as reflected in the provisions of their interconnection agreements.

Therefore, as part of the reliability assessment, CESA seeks greater clarity and understanding on the reliability assessment, including for short circuit duty, voltage support, and inertial response, in addition to the process involved in general. With clarifications on criteria (*e.g.*, short circuit duty thresholds in amps) for determining *de minimis* impacts (as is being done in Issue 9.6 of the Straw Proposal) and for creating a pathway for repowered energy storage resources to pay for certain upgrades or mitigation measures, CESA hopes that repowered energy storage resources can remain online and take advantage of less intensive and less costly study processes that deliver cost savings to ratepayers. Rather than defaulting repowered energy storage facilities to the full cluster study process, CESA aims to work with the CAISO to identify pathways, criteria, and thresholds by which these energy storage facilities can remain online and identify potential mitigation measures to help energy storage resources to follow less-intensive study pathways while maintaining grid reliability.

Overall, CESA supports the CAISO’s reliability study processes and understands that the charging impacts of the standalone energy storage facility must be studied. If the facility study in the material modification process reveals *de minimis* impacts, then CESA believes it is reasonable to allow the repowered energy storage facility to remain online even after the existing generation facility is decommissioned. However, if this study reveals material impacts, then CESA believes that it is appropriate to require this repowered energy storage project to undergo a full study process. Touching on our comments above, CESA aims to ensure that there is clarity on the reliability assessment in the facility study and that there are alternative pathways for repowered energy storage facilities to remain online.

Order 845 Implementation

As the CAISO is aware, interconnection issues scoped into the 2018 IPE Initiative will need to be viewed and addressed within the context of the Order 845 issued by the Federal Energy Regulatory Commission (FERC) on April 19, 2018 that amended the *pro forma* Large Generator Interconnection Procedures (LGIP) and Large Generator Interconnection Agreements (LGIA) in many different ways. There were

⁶ *Decision in Phase 2 on Results of Southern California Edison Company Local Capacity Requirements Request for Offers for Moorpark Sub-Area Pursuant to Decision 13-02-015*, D.17-09-034, issued on October 4, 2017, p. 17. <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M196/K810/196810195.PDF>

multiple determinations within Order 845⁷ that the CAISO has already instituted, including around the use of surplus interconnection service. Specifically around this repower-and-replace scenario, Order 845 mostly deferred this issue as being outside the scope of this rulemaking and as appropriate for being addressed elsewhere,⁸ except for one case. To “ameliorate business and financial risk” to the surplus interconnection service customer, Order 845 determined that surplus interconnection service customers (*e.g.*, repowered energy storage facility) may be granted a one-year grace period to remain online and operational starting from the date of retirement and permanent cessation of commercial operation of the original interconnection service customer (*e.g.*, existing generation facility), so long as the surplus interconnection service customer’s generation facility was previously studied for sole operation and the surplus interconnection service agreement reflects that the surplus interconnection service customer’s generation facility is allowed to continue operations following the retirement of the original interconnection customer’s generating facility.⁹

CESA seeks to understand how the new determinations and requirements of Order 845 will be implemented in the 2018 IPE Initiative, particularly around this repower-and-replace issue. First, CESA reads Order 845 as requiring that repowered energy storage facilities be studied in advance during the repowering request as a potential standalone facility to be granted the one-year grace period. CESA believes that studying this aspect of repowering requests may lengthen the material modification study process but at the same time decrease the need to re-study the remaining energy storage facility when the original generation facility retires. In implementing this requirement,¹⁰ CESA recommends that flexibility be maintained in the material modification process to allow for the timely repowering of generation facilities with energy storage facilities, regardless of whether the study process reveals that the repowering energy storage facility could feasibly remain online as a standalone facility in case the existing generation facility retires or ceases to operate.

Second, Order 845 requires that repowered energy storage facilities have specific language in the repowering interconnection agreements to allow for continued operation over the one-year grace period. CESA agrees that upfront provisions will enable the streamlined and continued operation of energy storage facilities without having to re-study them as standalone facilities.

However, while Order 845 only specifically grants a one-year grace period, CESA requests the CAISO consider whether a repowered energy storage facility that becomes a standalone energy storage facility upon the retirement of the original generation facility can reliably remain online beyond the one-year grace period. If the energy storage facility in the repower request is already studied as a potential standalone facility in advance of the interconnection and the allowance of continued operation is memorialized in the interconnection agreement, CESA does not understand why the repowered energy

⁷ 163 FERC ¶ 61,043, Department of Energy, Federal Energy Regulatory Commission, Docket No. RM17-8-000, Reform of Generator Interconnection Procedures and Agreements, Order No. 845, issued on April 19, 2018.

⁸ *Ibid*, p. 301.

⁹ *Ibid*, pp. 301-303

¹⁰ CESA is aware of one member company where this requirement was already implemented for their repower request. That is, the repowered energy storage was already studied as a standalone facility, suggesting that the CAISO is already doing this.

storage facility has any different grid impacts one year after the retirement of the original generation facility as compared to, say, five years after the retirement date. Feasibly, mitigation measures for any grid reliability impacts will already be included in the interconnection agreement and paid for by the interconnection customer at the time of interconnection, leading to no additional reliability concerns beyond the one-year grace period. FERC cites the concern around gaming and abuse of the continuation of surplus interconnection service as the basis for limiting the grace period for continued operation to one year.¹¹

While the interconnection process should reasonably limit any gaming or hoarding of surplus interconnection service to take advantage of less-intensive study processes, CESA makes a distinction between cases where excessive interconnection service is requested and granted to take advantage of surplus interconnection service utilization or transfer rules (*e.g.*, requesting 100 MW of interconnection service with the intention to only use 90 MW of interconnection service) from cases where existing interconnection service is being repowered with some other generation facility (*e.g.*, already utilizing 100 MW of interconnection service from an existing generation facility but repowering 10 MW with energy storage and reducing the existing generation facility to 90 MW). CESA believes that the latter scenario does not present a gaming scenario but rather offers opportunities for existing generation facilities to improve their operational efficiency in response to economic and policy forces and provides a potential transitional pathway. As a result, CESA requests that the CAISO provide its views and consideration of Order 845 requirements and address how it impacts this repower-and-replace issue in the IPE Initiative. In the CAISO's view, will the scenario where repowered energy storage facilities are allowed to remain online beyond the one-year grace period be in non-compliance with Order 845 requirements?

6. Generator Interconnection Agreements

6.1 Suspension Notice

CESA has no comment at this time.

6.2 Affected Participating Transmission Owner

CESA has no comment at this time.

6.3 Clarify New Resource Interconnection Requirements

CESA has no comment at this time.

6.4 Ride-through Requirements for Inverter based Generation

CESA has no comment at this time.

¹¹ *Ibid*, p. 302.

7. Interconnection Financial Security and Cost Responsibility

7.1 Maximum Cost Responsibility for NUs and Potential NUs

CESA has no comment at this time.

7.5 Shared SANU and SANU Posting Criteria Issues

CESA has no comment at this time.

7.6 Clarification on Posting Requirements for PTOs – Final Proposal

CESA has no comment at this time.

7.7 Reliability Network Upgrade Reimbursement Cap

CESA has no comment at this time.

7.9 Impact of Modifications on Initial Financial Security Posting

CESA has no comment at this time.

8. Interconnection Request

8.1 Study Agreement – Final Proposal

CESA has no comment at this time.

8.4 Project Name Publication

CESA has no comment at this time.

9. Modifications

9.1 Timing of Technology Changes

CESA has no comment at this time.

9.2 Commercial Viability – PPA Path Clarification

CESA has no comment at this time.

9.3 PPA Transparency – Final Proposal

CESA has no comment at this time.

9.4 Increase Repowering and Serial Re-Study Deposit– Final Proposal

CESA supports the CAISO's efforts to ensure that the re-study deposit covers the CAISO's costs. CESA only adds that since the re-study efforts will be underway for any repowering requests as well as for requests to keep repowered facilities online after the original generation facility retires, the CAISO should consider all the various pathways a repowered facility can remain online. For example, as noted in our comments on Issue 5.2 above, CESA recommends options to pursue potential mitigation measures if certain criteria in the reliability assessment are not met. Overall, CESA recommends that the CAISO consider all the pathways to allow repowered facilities to take advantage of less intensive, less

costly material modification study processes rather than having these facilities be pushed into the full cluster study process.

9.5 Clarify Measure for Modifications After COD – Final Proposal

CESA has no comment at this time.

9.6 Short Circuit Duty Contribution Criteria for Repower Projects

CESA generally supports the CAISO's proposal as it provides greater clarity and transparency on the reliability assessment but again recommends options for repowered facility customers to pursue potential mitigation measures if the short circuit duty contribution criteria are not met.

10. Additional Comments

CESA observes in the Straw Proposal that the only energy storage-specific issue that was included in the scope of the 2018 IPE Initiative is Issue 5.2. In our comments to the Issue Paper, CESA commented that two other energy-storage-specific issues should be considered by the CAISO in this initiative, and in the following section, we elaborate on our views on the CAISO's response.

First, in our previous comments, CESA recommended that the CAISO consider revising Resource Adequacy (RA) deliverability rules for distributed generation to enable distributed energy resource aggregations (DERA) for RA capacity value, to which the CAISO responded in the Straw Proposal by proposing to not include it in the 2018 IPE Initiative. Specifically, the CAISO explained that this issue may be best addressed in the ongoing Energy Storage and Distributed Energy Resources (ESDER) Initiative, which is currently in Phase 3 and dealing with a range of market participation pathway issues. While CESA understands the CAISO's position for not including this issue in the 2018 IPE scope, we view the ESDER Initiative as being more focused on market participation issues (*e.g.*, metering, settlements), performance methodologies (*e.g.*, baseline calculations for Proxy Demand Response resources), and product designs (*e.g.*, run-time, use limitations). By contrast, CESA believes that the deliverability issues for DERAs are more of a "study and allocation issue" that ensures sufficient delivery capacity to the overall system or to loads in the area (including whether upgrades are needed) is available to deliver on RA capacity value. As a result, this issue may be a better fit for the IPE Initiative.

CESA recognizes that there are more than 20 different topics that are scoped into the 2018 IPE Initiative and notes that there may be other issues that need to be addressed *a priori* in the ESDER Initiative and in the RA proceeding at the California Public Utilities Commission before deliverability issues can be addressed in the IPE Initiative. CESA thus recommends that the CAISO include the DERA deliverability issues in future IPE Initiatives, even as they are not included in this year's stakeholder process.

Second, CESA commented on the Issue Paper seeking further understanding on how the CAISO allocates deliverability for Effective Flexible Capacity (EFC) using a deliverability assessment that focuses on Net Qualifying Capacity (NQC), as the CAISO works to finalize potential, new product designs and flexible deliverability assessments for Flexible RA in Phase 2 of the Flexible RA Capacity and Must-Offer Obligation (FRACMOO) Initiative. CESA appreciates the CAISO's response to provide clarification on how the CAISO currently uses the summer peak conditions and the NQC as the upper limit for setting the EFC

while also recognizing that this approach may not fully account for flexible deliverability as more wind and solar resources come online.

CESA thus appreciates the CAISO's plans to investigate the need for flexible deliverability requirements on its own track following a discussion on the deliverability assessment methodology, though we are unclear on when and where this issue will be addressed. In particular, CESA would greatly appreciate the CAISO's clarification on the timeline on when this issue will be addressed in a separate track in the IPE Initiative as the FRACMOO Initiative moves toward approval of a final Flexible RA framework by Q4 2018. Given the urgency of flexible need, CESA hopes that the CAISO will immediately kickstart this new IPE track immediately following the approval of final Flexible RA framework.