

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking to Consider
Streamlining Interconnection of Distributed
Energy Resources and Improvements to Rule 21.

Rulemaking 17-07-007
(Filed July 13, 2017)

**COMMENTS OF THE CALIFORNIA ENERGY STORAGE ALLIANCE
ON THE ADMINISTRATIVE LAW JUDGE'S RULING DIRECTING RESPONSES TO
ATTACHED QUESTIONS ON WORKING GROUP ONE REPORT AND GRANTING,
IN PART, THE IREC MOTION TO MODIFY SCHEDULE**

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In accordance with the Rules of Practice and Procedure of the California Public Utilities Commission (“Commission”), the California Energy Storage Alliance (“CESA”)¹ hereby submits this response to the *Administrative Law Judge’s Ruling Directing Responses to Attached Questions on Working Group One Report and Granting, in Part, the IREC Motion to Modify Schedule* (“Ruling”), filed by Administrative Law Judge (“ALJ”) Kelly A. Hymes on August 15, 2018.

¹ 8minutenergy Renewables, Able Grid Energy Solutions, Advanced Microgrid Solutions, AltaGas Services, Amber Kinetics, American Honda Motor Company, Inc., Axiom Exergy, Brenmiller Energy, Bright Energy Storage Technologies, Brookfield Renewables, Carbon Solutions Group, Centrica Business Solutions, Consolidated Edison Development, Inc., Customized Energy Solutions, Dimension Renewable Energy, Doosan GridTech, Eagle Crest Energy Company, East Penn Manufacturing Company, Ecoult, EDF Renewable Energy, ElectrIQ Power, eMotorWerks, Inc., Enel, Energport, ENGIE, E.ON Climate & Renewables North America, esVolta, Fluence Energy, GAF, General Electric Company, Greensmith Energy, Ingersoll Rand, Innovation Core SEI, Inc. (A Sumitomo Electric Company), Iteros, Johnson Controls, Lendlease Energy Development, LG Chem Power, Inc., Lockheed Martin Advanced Energy Storage LLC, LS Power Development, LLC, Magnum CAES, Mercedes-Benz Energy, NantEnergy, National Grid, NEC Energy Solutions, Inc., NextEra Energy Resources, NEXTracker, NGK Insulators, Ltd., NRG Energy, Inc., Parker Hannifin Corporation, Pintail Power, Primus Power, Range Energy Storage Systems, Recurrent Energy, Renewable Energy Systems (RES), Sempra Renewables, Sharp Electronics Corporation, SNC Lavalin, Southwest Generation, Sovereign Energy, Stem, STOREME, Inc., Sunrun, Swell Energy, True North Venture Partners, Viridity Energy, VRB Energy, Wellhead Electric, and Younicos. The views expressed in these Comments are those of CESA, and do not necessarily reflect the views of all of the individual CESA member companies. (<http://storagealliance.org>).

I. INTRODUCTION.

The Rule 21 Working Group 1 worked on a series of important enhancements that aims to streamline the Rule 21 interconnection process for the growing number of distributed energy resources (“DERs”). As the number of DER installations grow, the Rule 21 interconnection process must also evolve to balance the needs to ensure reliable and safe interconnection while providing DER providers with interconnection transparency and certainty and accounting for the physical characteristics and operational profiles of various DER types and technologies in interconnection studies to ensure that DERs are fairly and reasonably reviewed without triggering additional studies or upgrade costs, if unnecessary. CESA thus appreciated the opportunity to actively participate in Working Group 1 and provides our responses to questions below regarding the Working Group 1 Report and workshop, as listed in Attachment 1 of the Ruling.

II. RESPONSES FOR ISSUE 1 QUESTIONS.

As reflected in the Working Group 1 Report, CESA supports Proposal 1a to raise the threshold to 1 MVA and also finds merits in the Commission adopting Proposal 1b as well that would maintain the measurement of system size by net export. CESA agrees with many parties that thresholds to exempt DER projects from Screen Q should be reasonably set to avoid potentially costly and time-consuming interconnection study in the cluster study process, if unnecessary to determine electrical independence from the transmission system.

Question 1: For non-Utility stakeholders: Explain whether you prefer the use of nameplate capacity or net export to measure the threshold for the Screen Q exemption. What are the policy reasons to justify adoption of your preference?

CESA prefers the use of net export to measure the threshold for the Screen Q exemption because the use of net export more accurately estimates the potential physical impacts to the grid and the physical electric interdependence with the transmission system. As CESA understands it,

electrical interdependence is determined by the incremental power flow onto the transmission system, as outlined in Appendix DD Section 4.2 of the California Independent System Operator (“CAISO”) tariff, but also determined by the short-circuit duty (“SCD”) contribution of the interconnecting DER, which will likely require investor-owned utility (“IOU”) engineers to distinguish the appropriate nameplate capacity of the inverter *and* the magnitude of injections of current into a potential fault to determine electrical interdependence. Thus, CESA believes that a blanket exemption based on either nameplate capacity or net export may not ensure sufficient safeguards against electrical interdependence and a disaggregation of the two effects of power flow and SCD contribution may be needed in establishing a reasonable Screen Q exemption threshold.

At the same time, CESA argues that the policy reasons for determining whether nameplate capacity, net export, or some other combination of threshold criteria is appropriate should be based on the physical interconnection studies and reliability requirements of Rule 21, as opposed to making this policy determination based on cost allocation concerns, which can be addressed in another phase of this Rule 21 proceeding. In reviewing and enhancing Screen Q, the focus has been on the reliability impacts of interconnecting DERs and how the exemption below a certain threshold was determined to be *de minimus* given IOU interconnection data.² In determining whether the Screen Q exemption threshold should be based on net export, it would be helpful for the IOUs to demonstrate how the use of net export as the threshold (as the current Rule 21 tariff language is written) would materially impact and risk system reliability, which CESA understands that comments to this Ruling is intended to serve. CESA thus looks forward to reviewing the IOUs’ responses to the questions posed in this Ruling and plans to respond accordingly.

² Rule 21 Working Group 1 Report, p. 8.

Question 2: Explain how calculating net export of up to 1 MVA for systems with nameplate 1 MVA or above is effectively modifying the exemption in Proposal 1 to 2 MVA or greater nameplate. (See Report at 10.)

CESA seeks to further understand this scenario raised by the IOUs in their comments to this Ruling. At first glance, CESA believes that the IOUs' concerns are around the potential for all DER inverters feeding a distribution system short all at once when allowing for DERs with nameplate capacity greater than 1 MVA but with net export limits below or above 1 MVA. CESA acknowledges that this is an important concern, but many of these concerns may be addressed through software or firmware controls. With such verifiable controls in place, it may be unnecessary to 'cap' total nameplate capacity for the purposes of the Screen Q exemption as this example seems to suggest – *i.e.*, so long as net exports remain below 1 MVA under a net export approach, the total nameplate capacity of the DER systems may be much greater than 1 MVA, with much of the capacity serving onsite load.

Question 3: Should the Commission allow software or firmware controls to limit export to under 1 MVA or MW, pending the creation of a certification scheme?

As follow-up to our response to Question 2, CESA recommends that the Commission allow for software or firmware controls to limit net export and notes that many efforts are underway in the Net Energy Metering ("NEM") proceeding (R.14-07-002) in allowing software options for DC-coupled solar-plus-storage systems³ and at various Standards Development Organizations ("SDOs") in creating a certification scheme for software controls. For the purposes of the Screen Q exemption, the Commission should explicitly allow software or firmware controls to limit export to account for the SCD contribution of the DER project, but at the same time, CESA also observes that the allowance of software or firmware controls is not new as it relates to Rule 21. The IOUs

³ *Administrative Law Judge's Ruling Requiring Supplemental Information Regarding Petition of California Solar and Storage Association to Modify Decision 14-05-033*, issued on July 19, 2018.

already rely on software or firmware controls in the Rule 21 interconnection process, for example, in studying standalone, inverter-based, non-exporting energy storage facilities across a number of Rule 21 screens while operating in pre-defined ‘charging modes’ – *e.g.*, charging functions do not increase the host facility’s existing peak load demand – that are enabled by software or firmware controls. In other words, to assess pass/fail across a number of specific Rule 21 screens, the IOUs are already relying on DERs to operate in pre-defined ways to ensure safety and reliability and thus similar solutions should be considered in establishing policies around Screen Q exemptions.

Finally, while a certification scheme would be ideal and enable widespread use of software and firmware controls, CESA understands that the IOUs currently approve software controls on a case-by-case basis through ‘testing regimes’ that enable applicant-specific configurations. In the interim until a certification scheme from a Nationally Recognized Testing Laboratory (“NRTL”) is approved and adopted by the IOUs, such case-specific use of software and firmware controls should continue to be allowed and should inform the determination on the thresholds and implementation concerns of the Screen Q exemption.

Question 4: Explain why a project, with net export below 1 MVA and nameplate capacity above 1 MVA, is more likely than another project, with nameplate capacity equal to the first project’s net export and with all generation exported, to be interdependent to the transmission system and contribute to the need for network upgrades.

Similar to our response to Question 2, CESA looks forward to reviewing and responding to the IOUs’ and other parties’ responses to this question. If net exports is found to be the real measure of system impacts as distribution planning processes must plan for load loss risk, both of the example systems as posed in the question should have the same impact.

Question 5: During the workshop, SCE stated that non-exporting energy storage systems could have a higher short circuit duty contribution than exporting solar PV systems with the same nameplate capacity. Define short circuit duty contribution and explain why different technologies

of the same nameplate capacity may have different short circuit duty contributions.

CESA seeks to further understand this concern from SCE. As noted previously, CESA understands that there is no apparent difference in terms of SCD contribution of any inverter-based generation or storage, regardless of whether the specific DER is exporting or non-exporting. The SCD contribution should be theoretically the same between non-exporting energy storage systems and exporting solar PV systems with the same nameplate capacity.

Question 6: Is short circuit duty contribution considered in the Electrical Independence Test?

In referencing the CAISO tariff (Appendix DD Section 4.2.2), CESA understands that SCD contribution is considered in the Electrical Independence Test (“EIT”), especially with some ‘clean up’ in the references and linkages between the Rule 21 tariff and the CAISO tariff, pursuant to Proposal 3 on Issue 1.

Question 7: Should Screen Q differentiate among technology types in order to more accurately account for short circuit duty contribution? If so, how?

CESA sees no need for Screen Q to differentiate among technology types but to characterize the physical attributes that underlie the SCD contribution concerns in Screen Q. There may be differences in SCD contribution based on inverter design but not based on inherent differences between inverter-based technology types.

Question 8: What, if any, are the material electrically-related differences between net energy metering (“NEM”) and non-NEM projects for the purposes of the Screen Q exemption?

CESA disagrees with the IOUs that non-NEM projects are more likely to contribute to the need for Network Upgrades and/or reliability system upgrades⁴ and does not see any electrically-

⁴ Rule 21 Working Group 1 Report, p. 12.

related differences, unless the IOUs demonstrate otherwise.⁵ The focus of Working Group 1 on limiting the Screen Q exemption to NEM projects appears to hinge on the cost-allocation concerns and the lack of discussion on this matter in the working group. CESA believes the cost-allocation issue may be of less significance if it can be demonstrated that the likelihood of extending the Screen Q exemption to non-NEM projects would have *de minimus* impact on the potential Network Upgrades that could be triggered if the exemption is not in place. As noted before, there may be no material electrically-related difference for non-NEM projects, but it would also be helpful for these discussions for the IOUs to provide data on the number of non-NEM projects that have triggered Screen Q related upgrades, similar to the data reported on NEM systems, which would inform discussions around whether the extension of this exemption to all projects would have *de minimus* impact.

Question 9: Describe potential issues with expanding the Screen Q exemption from NEM projects to all projects, including any interactions with the Utilities’ wholesale distribution tariff study processes and the CAISO Tariff procedures.

CESA has no comment at this time but looks forward to reviewing and potentially responding to other parties’ responses to this question.

III. RESPONSES FOR ISSUE 3 QUESTIONS.

CESA generally agrees with non-utility stakeholders that notification-only and abridged/streamlined interconnection processes should be explored, developed, and implemented to enable regular maintenance and replacement as well as enhancement to new and existing DER interconnections, given that policy landscapes, rates, and technologies change. With a focus on the

⁵ This distinction between NEM and non-NEM systems may have been due to non-NEM systems being mostly non-inverter-based technologies in the past, but with inverter-based energy storage systems becoming more prevalent, this assumption may no longer be appropriate since California is seeing inverter-based technologies for both NEM and non-NEM systems.

physical grid impacts to reliability and safety under Rule 21, the Commission and the IOUs should explore how Rule 21 can be improved to allow for reasonable and efficient processes.

Question 1: In Proposal 1, if only one modification is allowed per interconnection application, is there a certain point in the interconnection process where the modification should be allowed? If not, how can the Utilities ensure that multiple issues with an application are not given back to an applicant to be remedied at different times in the interconnection process, thus necessitating more than one modification?

A pre-defined point in the interconnection process to allow for modifications may be reasonable to avoid significant delays in the Fast Track process and to mitigate any impacts to other applicants in the interconnection queue, mirroring how the CAISO has pre-defined windows in the cluster study process to consider material modification requests (*i.e.*, between Phase 1 and Phase 2 studies) while allowing for non-material modifications at any time of the process. A similar pre-defined period to consider modifications combined with the flexibility to allow for minor modifications throughout the process may strike the right balance.

Question 2: In Proposal 2, the Utilities state that Process Options 2 and 3 would take 2 to 3 years to develop and implement. Developers say they need an interim solution. What would an interim solution look like? Provide details and a proposed schedule or timeline.

CESA understands that the IT systems needed to accommodate Process Options 2 and 3 may require some time and money to develop and implement. CESA has no specific interim solution at this time, and any interim solution may require some modifications to the interconnection portal and IT systems. There may be an interim process by which developers could notify the IOUs of upcoming scheduled maintenance and replacement cycles with a certain period of advanced notice and allow the developer to proceed unless the IOUs respond to specific notifications to request additional information and/or conduct a ‘spot-check’ review. In general, the IOUs should aim to identify interim solutions for Process Options 2 and 3 to require minor

modifications to the interconnection portal to allow for reasonable and safe maintenance and repairs while more significant overhauls are being implemented.

Question 7: During the workshop, TURN stated that the verification process in Process Option 3 involves verifying the paperwork and does not entail any other work by the Utilities, i.e., a “truck roll.” For Use Case 2, which involves replacing like for like equipment and where system output does not exceed what is listed in the original interconnection agreement, what is the worst-case scenario if Process option 1 or 2 is implemented? Can this worst-case scenario be mitigated?

CESA views Use Case 2 as regular maintenance or replacements that may not involve the exact same make and model of equipment but is otherwise unchanged from the original interconnection agreement in terms of nameplate capacity of equipment and operational profile. Under Process Options 1 or 2, there may feasibly be concern that the IOU has no ‘say’ before a modified DER goes online that may not adhere to ‘like-for-like’ criteria to not change nameplate capacity and/or maintain the same operational profile. However, at least in terms of operational profile, this is not a unique worst-case scenario concern for modified DERs, as existing DERs may also change their operational profile in breach of the original Rule 21 interconnection agreement. Such concerns are addressed through interconnection agreements that apply penalties and costs to any breach of contract. With the IOUs able to enforce the original interconnection agreement, there should be less concern about worst-case scenarios, given that Use Case 2 is supposed to involve no changes to nameplate capacity or operational profile of the equipment.

Question 8: What is the worst-case scenario if Process option 2 is implemented for Use Case 3? Can this worst-case scenario be mitigated?

Worst-case scenarios for DERs may involve delivering output beyond the planned-for interconnection capacity and at specific times, which may cause operational concerns, but CESA also notes that various NRTL certifications and software/firmware controls are in place to guard against such worst-case outcomes, as noted in previous responses to questions.

Question 9: If firmware and/or software controls are allowed for Use Case 3, describe the electrical engineering basis for adding a limitation that firmware and/or software controls only be allowed if the system capacity otherwise would not increase more than 10%.

CESA believes that it may be important to consider whether any percentage limitation (or a higher percentage limitation) is appropriate if firmware and/or software controls can ensure physical safety and reliability by constraining output.

Question 10: For non-Utility stakeholders: What evidence is available to indicate that firmware and/or software controls are reliable?

Similar to our response to Question 3 for Issue 1, CESA believes that firmware and/or software controls have been proven to be reliable in committing to specific operational profiles (e.g., not charge from the grid, or never raise a customer's peak demand) to interconnect onto the distribution system. Additionally, the Commission should also consider how Phase 1 advanced smart inverter requirements are currently being operationalized using software and firmware, further demonstrating how these controls are already being deployed for other purposes and may similarly be leveraged for this specific Rule 21 screen.

IV. RESPONSES FOR ISSUE 4 QUESTIONS.

CESA understands that the IOUs seek greater visibility and situational awareness of DERs under 1 MW and therefore proposed to reduce the threshold for requiring telemetry from projects with capacity of 1 MW to 250 kW. However, when balanced against the cost of telemetry, this proposal may significantly impact the costs of development of DER projects, which led to CESA and non-utility stakeholders to oppose this proposal. First, before considering this proposal, CESA believes that the IOUs must clearly discuss scenarios and situations on where and why such revised telemetry requirements are needed. The frequency of such situations where greater visibility into smaller DERs would also be beneficial to inform non-IOU stakeholders and the Commission.

Furthermore, at the June 19, 2018 workshop, the IOUs pointed to how Hawaii adopted a similar proposal but CESA does not believe those parallels are reasonable, given the differences in the size of their distribution, in the way their distribution grid is configured, and in the share of renewables penetration on their distribution grid. Second, even when greater visibility into DERs is determined to be justified, there may be alternative proposals other than revising the threshold for telemetry requirements that could achieve the same end, such as taking a sampling approach to smaller DERs that the CAISO utilizes to inform their short-term forecasts, or sharing of customer-owned data from DER providers to the IOU Energy Management Systems to deliver telemetry-like operational data.

Question 3: For non-Utility stakeholders: Under Proposal 5, describe a maintenance plan for how to cover equipment repairs beyond the end of a warranty period.

CESA has no comment at this time.

V. CONCLUSION.

CESA appreciates the opportunity to submit these responses to the questions posed in the Ruling and looks forward to working with the Commission and stakeholders in this proceeding.

Respectfully submitted,



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