BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking Regarding Policies, Procedures and Rules for the California Solar Initiative, the Self-Generation Incentive Program and Other Distributed Generation Issues.	Rulemaking 12-11-005 (Filed November 8, 2012)

COMMENTS OF THE CALIFORNIA ENERGY STORAGE ALLIANCE ON PETITION FOR MODIFICATION ON SUSPENSION OF THE ROUND-TRIP EFFICIENCY METRIC IN THE SELF-GENERATION INCENTIVE PROGRAM

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In accordance with the Rules and Procedure of the California Public Utilities Commission ("Commission"), the California Energy Storage Alliance ("CESA")[1] hereby submits these comments on Stem, Inc.'s Petition for Modification of Decision 15-11-027, filed on November 22, 2017 ("Petition"). The Petition proposes changes to the Self-Generation Incentive Program ("SGIP") whereby the Round-Trip Efficiency ("RTE") metric would be suspended from use in the SGIP. The Petition further asks the Commission to direct a process to develop revised interim and long-term metrics designed to measure and promote the reduction of greenhouse-gas ("GHG") emissions. By suspending the SGIP's current "forced dispatch" RTE,

[1] 8minutenergy Renewables, Able Grid Energy Solutions, Adara Power, Advanced Microgrid Solutions, AES Energy Storage, AltaGas Services, Amber Kinetics, American Honda Motor Company, Inc., Brenmiller Energy, Bright Energy Storage Technologies, BrightSource Energy, Brookfield, California Environmental Associates, Consolidated Edison Development, Inc., Customized Energy Solutions, Demand Energy, Doosan GridTech, Eagle Crest Energy Company, East Penn Manufacturing Company, Ecoult, EDF Renewable Energy, ElectrIQ Power, eMotorWerks, Inc., Energport, Energy Storage Systems Inc., GAF, Geli, Green Charge Networks, Greensmith Energy, Gridscape Solutions, Gridtential Energy, Inc., Hitachi Chemical Co., IE Softworks, Innovation Core SEI, Inc. (A Sumitomo Electric Company), Johnson Controls, LG Chem Power, Inc., Lockheed Martin Advanced Energy Storage LLC, LS Power Development, LLC, Magnum CAES, Mercedes-Benz Energy, National Grid, NEC Energy Solutions, Inc., NextEra Energy Resources, NEXTracker, NGK Insulators, Ltd., NICE America Research, NRG Energy, Inc., Ormat Technologies, OutBack Power Technologies, Parker Hannifin Corporation, Qnovo, Recurrent Energy, RES Americas Inc., Sempra Renewables, Sharp Electronics Corporation, SolarCity, Southwest Generation, Sovereign Energy, Stem, STOREME, Inc., Sunrun, Swell Energy, Viridity 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).

the Petition argues that it should no longer be used for purposes of establishing eligibility for the SGIP or for evaluating GHG emissions from installed SGIP projects.

I. INTRODUCTION.

CESA is a strong proponent of the three primary program goals of the SGIP, including GHG emission reductions, which include:[2]

1. **Environmental goals:** Reduction of GHG emissions, the reduction of criteria air pollutants, and the mitigation of other harmful environmental impacts (such as water usage).[3]

2. **Grid support goals:** Reduce or shift peak demand, improve efficiency (*e.g.*, fewer line losses) and reliability of the transmission and distribution system, lower grid infrastructure costs, provide ancillary services, and ensure customer reliability of distributed energy resources ("DERs")[4]

3. **Market transformation goals:** Increases the adoption and penetration of DER technologies[5]

SGIP is a vitally important and meaningful program to many energy storage customers and project developers. It is also one of the largest in the world and one of the most advanced, placing California in a leadership role in resolving barriers and other issues such that energy storage systems on customer's premises can be deployed and operated to support larger policy goals. CESA thus strongly supports continued deliberations on how to improve the SGIP,

[2] *Decision Revising the Self-Generation Incentive Program Pursuant to Senate Bill 861, Assembly Bill 1478, and Implementing Other Changes*, D.16-06-055, issued July 1, 2016.

[3] *Ibid*, Finding of Fact Number 1.

[4] *Ibid*, Finding of Fact Number 2.

[5] *Ibid,* p. 10 and Finding of Fact Number 3.

particularly as the body of operational experience grows and real-world challenges of energy storage, if any, become clearer.

CESA shares the Petition's stated concerns regarding near-term enforcement of the RTE performance requirement as a GHG emission reduction metric due to the potential for enforcement to potentially further increase GHG emission in the near term by inadvertently increasing cycling from currently installed SGIP projects absent appropriate operational signals as to when marginal electricity GHG content may be low. CESA supports immediate launch of a Working Group to develop better operational dispatch signals that can be incorporated into behind the meter energy storage dispatch algorithms on an ongoing basis to ensure that the SGIP's GHG emission reduction goals are achieved.

To ensure that only sufficiently efficient energy storage systems are eligible for the SGIP, CESA recommends employing a manufacturer-rated single-cycle RTE as an SGIP eligibility metric. CESA is committed to working with the Commission and its staff to expeditiously develop new and better control signals to align energy storage system dispatch with the GHG emissions reduction goals of the SGIP. CESA supports rapid action to this end, and strongly believes this can and should be done without any suspension of the SGIP.

II. CESA STRONGLY SUPPORTS THE SGIP'S GOAL OF ACHIEVING GHG EMISSION REDUCTIONS.

As demonstrated in the original RTE calculations, energy storage can reduce usage of high-GHG emission producing resources on the grid by capturing output from lower emission producing resources, including zero-emissions resources. Over time, these resources contribute not only to the immediate lower GHG emission operations of the grid but also to the future

composition of the grid.[6] CESA takes the 2016 Energy Storage Impact Evaluation ("Itron Report") findings very seriously and therefore provides these comments on how best to support the use of energy storage to meet SGIP goals. As part of its support for driving GHG emissions reductions through SGIP, CESA strongly recommends collaborative consideration of ideas for better achieving GHG emission reduction and grid support goals while also supporting energy storage market transformation and customer-service goals.

III. CURRENT RETAIL TARIFFS ARE INSUFFICIENT TO DRIVE ENERGY STORAGE DISPATCH IN A MANNER THAT WILL REDUCE GHG EMISSIONS.

Behind the meter energy storage systems installed pursuant to current SGIP rules are often optimized to deliver savings for the host customer, by charging when energy costs are low and by discharging to displace usage during high priced kWh periods and to alleviate demand charges. As such, optimizing the hosts' actual energy consumption subject to its retail tariff structure is the primary guide for energy storage dispatch behavior. The findings from the Itron Report indicate that retail tariffs are at times a poor proxy for behind the meter energy storage to dispatch for GHG benefit.[7]

CESA has long advocated that energy storage should operate according to the market signals it is exposed to. Without a proper market signal indicating when marginal kWhs are lowest in GHG emission content, energy storage may not optimize for this outcome. This is why CESA, in prior comments, has advocated for an optional incentive charging tariff to be

[6] D.15-11-027 included a 'build-margin' component of the GHG benefits of any SGIP-eligible energy storage system, which represented how energy storage solutions can change the generation fleet composition over time.

[7] *See*, E3 presentation on 2016 Impact Evaluation, November 15, 2017, Slide 6, highlighting how, under current operations, there is "a misalignment between incentives for bill reduction and GHG emissions."

established for behind the meter energy storage systems, for example, to allow energy storage systems to charge at day-ahead LMP.[8]

IV. ABSENT BETTER GHG MARKET SIGNALS, ENFORCEMENT OF A MINIMUM RATE FROM A PERFORMANCE PERSPECTIVE MAY IN THE NEAR TERM, HAVE THE UNINTENDED CONSEQUENCE OF *INCREASING* GHG EMISSIONS FROM SOME EXISTING PROJECTS.

As described in the Petition, near-term enforcement of the current SGIP RTE performance requirement as a GHG emission reduction metric may have the unintended consequence of further increasing GHG emissions in the near term by inadvertently increasing untimely cycling by currently installed projects absent appropriate operational signals as to when marginal electricity GHG content is low.

D.15-11-027 determined that energy storage systems must have a round-trip efficiency of 66.5% or higher. This 66.5% requirement was based on key assumptions about the different marginal GHG-emission rates that can occur on the grid at peak and off-peak times, along with other factors regarding line losses, how energy storage may change the currently operating generating units as well as the building of future generation resources, and about how energy storage solutions degrade over time.

Numerous references in the Itron Report for energy storage resources operating in 2016, argue that the actual operation of energy storage systems sometimes can be disconnected from the calculations that supported the RTE metric because actual operations are linked to optimizing the customer's electric bill savings under a current electric tariff structure, which, as stated above, is a poor proxy for when to charge to reduce GHG emissions.

[8] *See, e.g., Comments of the California Energy Storage Alliance on Assigned Commissioner's Ruling on Implementation of Assembly Bill 1637*," January 31, 2017, pp. 12-15.

To illustrate how the enforcement of the RTE metric can have unintended consequences, one can recognize that some current retail rates have peak and off-peak rates that do not align with the expected peak and off-peak conditions on the grid. Given this fact, an energy storage resource that is 100% efficient (*i.e*. with an RTE of 100%) might still increase GHG emissions rather than lowering them as expected and intended. Without access to GHG data and an accurate or consistently correct price signal to charge and discharge at the correct times, a customer cannot time operations to reduce GHG emissions. This example highlights how misalignments in the timing of energy storage dispatch can be counter-productive and how enforcement of the RTE metric *ipso facto* can increase GHG emissions.

While CESA understands the need to have energy storage resources be dispatched and useful in reasonable ways, any enforcement that results in counter-productive GHG emission-increasing dispatches would be unreasonable. Also, given the importance of the SGIP and the fact that learning that is coming from its implementation, creative interim solutions could be developed - such as requiring non-compliant projects to purchase emissions allowances. This could allow SGIP projects to reasonably continue operations and ensure that program GHG emission reduction goals are met while Working Group derived solutions for appropriate GHG emission reduction-related dispatch signals are developed.

However, CESA also agrees that it is appropriate and reasonable for energy storage resources receiving SGIP funds to be subject to an up-front efficiency standard. As such CESA supports retaining the "single-cycle" RTE as an up-front eligibility requirement based on the RTE reported on an energy storage system's specification sheet.

V. A COMMISSION-DIRECTED WORKING GROUP SHOULD BE ESTABLISHED TO URGENTLY DEVELOP AND VET ADDITIONAL GHG EMISSION REDUCTION SIGNALS FOR BEHIND THE METER ENERGY STORAGE PROJECTS.

CESA recognizes and supports the importance of achieving GHG emission reductions. At the same time, CESA also recognizes that the SGIP is still in learning mode, and that while some installed projects are effectively reducing GHGs, others are not.[9] To ameliorate this circumstance, CESA sees a need for urgent development and consideration of different approaches that could be implemented that would better align the economic incentives for customers deploying SGIP- funded resources subject to the GHG emission reduction goal of the SGIP.

CESA is concerned that, absent any needed changes or rate reforms, future evaluations of the SGIP program may show results that are similar to those in the Itron Report. Establishing a Working Group approach is broadly supported by CESA members and would be a logical and prudent next step.

The timing is right for using a Working Group to further consider changes to the SGIP regarding the issues raised in the Petition. As compared to when D.15-11-027 was issued, SGIP stakeholders and the Commission now have more experience with SGIP-eligible energy storage systems making it timely to consider SGIP rules and tools for directing and achieving GHG emission reductions. For instance, some SGIP-eligible energy storage resources now have several years of operating experience, and SGIP project developers have also advanced their modeling capabilities, which can help to consider how new SGIP rules, rates, or metrics would translate into operating changes for energy storage systems.

[9] Itron Report, pp. 3-47.

The market also has new information streams that show marginal unit data, such as Watt Time. Additionally, the SGIP Program Administrators ("PAs") have broader experience overseeing and tracking energy storage system, and the SGIP Measurement and Verification efforts conducted by Itron have established a better baseline and range of operational data which can be used to compare current with future results.

CESA strongly supports use of a Commission-directed Working Group to identify and vet ideas for developing market signals or other means to encourage charging when GHG emissions in marginal electricity use is at its lowest. To do this, CESA recommends that the Working Group include participation by the Commission's Energy Division, the PAs, CESA and energy storage industry members. Itron, in the role of M&V expert and potential data analyst or project manager, should also be included as well as any other stakeholders interested in joining.

The scope of work for this Working Group should include a consideration of multiple ideas or alternatives for SGIP rules and metrics that could promote achievement of the GHG emission reduction goal. The Working Group should be tasked with considering and evaluating any new solutions based on theoretical expectations, modeling, studies, or potentially even pilots, if time and funding allows.[10]

The following project plan outline could reasonably guide the Working Group:

- January 2018: Working Group convened and deliverables, schedule, and funding plan (if any) agreed to.

[10] CESA welcomes considerations of pilots but is uncertain as to the ability of pilots to be conducted quickly enough. Additionally, pilots may require both willing customers with already-installed SGIP systems as well as funding sources in order to insulate pilot participants from any negative effects. These factors should be considered by the Working Group in determining if and how pilots could be used to help this GHG emission-related work.

- February, 2018: Working Group agrees to "short-list" as a study plan for potential solutions to study, model, or pilot and cements a plan to evaluate, vet, model, or pilot each idea.
- Q1-Q2, 2018: Working Group executes its study plan.
- Q2, 2018: Working Group summarizes findings and recommendations, if any, to inform further refinements to SGIP rules.

CESA looks forward to collaborating with the Commission and stakeholders as to how to best further improve the SGIP to and ensure that energy storage resources achieve all of the goals of the program with this Working Group approach.

VI. CESA SUPPORTS CONTINUED USE OF THE RTE REQUIREMENT AS AN ENERGY STORAGE TECHNOLOGY ELIGIBILITY STANDARD IN THE SGIP.

CESA supports all forms of energy storage, but also recognizes that, given the goals, scale and general operating expectations for SGIP projects, some form of minimum efficiency eligibility metric is appropriate. CESA thus recommends using the minimum RTE as manufacturing-type, single-cycle "specification sheet" metric that can be evaluated for initial SGIP project eligibility.

Keeping the manufacturer-rated RTE as an initial eligibility criterion will ensure that SGIP projects have the capability of cycling with an efficiency rating that at least matches the expectations and capabilities required by D.15-11-027, where significant formulations, data points, and assumptions were detailed in the Commission's record in order to approximate a basic efficiency requirement for SGIP projects. Retention of a specification sheet form of eligibility will promote the use of efficient systems in the SGIP which is designed to promote systems that are used with some frequency. This use of a specification sheet RTE would thus create a reasonable threshold for efficiency expectations for projects eligible for SGIP funds.

By maintaining a minimum required manufacturer rated single-cycle RTE, the SGIP will ensure that any future SGIP-funded projects will meet this minimum level of efficiency and thus can be dispatched with appropriate GHG emission reduction and other price signals for maximum benefit to the grid.

VII. THE SGIP SHOULD REMAIN OPEN WHILE ADDITIONAL GHG EMISSION REDUCTION-ORIENTED SOLUTIONS ARE ESTABLISHED AND INTERIM SOLUTIONS CAN BE CONSIDERED.

CESA strongly opposes any suspension of the SGIP at this time. The SGIP is helping achieve market transformation goals, and some projects are providing GHG emissions reductions as planned and intended.[11] With a Working Group formed and ready to immediately address the GHG emission reduction standard issue, the SGIP should be able to operate effectively in both the near-term and the long-term.

The SGIP is an important program for behind the meter energy storage projects that can provide many benefits to ratepayers. These projects help promote a more informed set of electric ratepayers and customers who can better understand how their use of distributed energy resources can support larger grid needs, including renewables integration.

Since the SGIP must clearly remain open while additional GHG emissions-reduction oriented solutions are established, CESA emphasizes that any resulting GHG emission reduction market signal or other solutions developed by the Working Group can be implemented for existing and future energy storage systems by simply updating their respective dispatch algorithms. Further, some near-term interim solutions have been already been identified by some of the PAs that may help address concerns raised by the Itron Report's findings, including allowing non-compliant systems to purchase California Cap and Trade emissions-allowances to

[11] Itron Report, p. 3-47.

offset program GHG emissions. Such a step could certainly effectively ensure GHG emissions in the near-term.

VIII. CONCLUSION.

CESA appreciates the opportunity to submit these comments on the Petition and looks forward to working with the Commission and stakeholders to develop ideas on how to better ensure that SGIP meets GHG emissions reduction, grid support, and market transformation goals.

Respectfully submitted,

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