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 PROPOSED DECISION REGARDING NET ENERGY METERING INTERCONNECTION ELIGIBILITY FOR STORAGE DEVICES PAIRED WITH NET ENERGY METERING FACILITIES

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The California Energy Storage Alliance ("CESA")[1] hereby submits these Comments on the *Proposed Decision Regarding Net Energy Metering Interconnection Eligibility for Storage Devices Paired With Net Energy Metering Generation Facilities,* issued April 5, 2014 ("Proposed Decision").

I. INTRODUCTION.

CESA strongly supports the Proposed Decision, and also makes certain recommendations for revisions discussed below. CESA urges the Commission to adopt in a final decision as soon

[1] The California Energy Storage Alliance consists of 1 Energy Systems, A123 Energy Solutions, Advanced Rail Energy Storage, AES Energy Storage, American Vanadium, Aquion Energy, Beacon Power, Bosch Energy Storage Solutions, Bright Energy Storage, Brookfield Renewable Energy Group, CALMAC, ChargePoint, Clean Energy Systems Inc., CODA Energy, Consolidated Edison Development Inc., Customized Energy Solutions, DN Tanks, Duke Energy, Eagle Crest Energy, EaglePicher, East Penn Manufacturing Co., Ecoult, EDF Renewable Energy, EnerSys, EnerVault, EVGrid, FAFCO Thermal Storage Systems, FIAMM Group, FIAMM Energy Storage Solutions, Flextronics, Foresight Renewable Systems, GE Energy Storage, Green Charge Networks, Greensmith Energy Management Systems, Gridscape Solutions, Gridtential Energy, Halotechnics, Hitachi Chemical Co. America, Hydrogenics, Ice Energy, Imergy Power Systems, ImMODO Energy Services, Innovation Core SEI, Invenergy, K&L Gates LLP, KYOCERA Solar, LG Chem Ltd., LightSail Energy, LS Power Development, NextEra Energy Resources, NRG Energy, OCI Company Ltd., OutBack Power Technologies, Panasonic, Parker Hannifin, PDE Total Energy Solutions, Powertree Services, Primus Power, RES Americas, Rosendin Electric, S&C Electric Co., Saft America, Samsung SDI, SeaWave Battery Inc., Seeo Inc., Sharp Labs of America, Silent Power, SolarCity, Sovereign Energy Storage LLC, Stem, Stoel Rives LLP, TAS Energy, Tri-Technic, UniEnergy Technologies, and Wellhead Electric Co. 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

as possible to streamline and expedite administration of the Commission's net energy metering ("NEM") program and Self Generation Incentive Program ("SGIP") to take full advantage of the benefits of energy storage. In addition to adopting the Proposed Decision, as revised consistent with CESA's recommendations, the Commission should promptly issue a scoping memorandum, or comparable ruling, in this proceeding to provide urgently needed further guidance to the Commission's Staff. Such a ruling should much more broadly address and resolve numerous widely recognized issues negatively impacting both the NEM program and the SGIP. [2]

Further, CESA urges the Commission to also issue a scoping memorandum, or comparable ruling, addressing and numerous known interconnection issues related to energy storage in the Commission's open distributed generation ("DG") interconnection proceeding, R.11-09-011.[3] CESA greatly appreciates the Commission's present focus on DG and energy storage evidenced by the Proposed Decision, but CESA strongly urges the Commission to act now to address and resolve-long recognized open issues that are within the scope of both this proceeding and R.11-09-011 in a comprehensive and coordinated manner to assure attainment of California's DG goals and meet energy storage targets established in the Commission's energy storage proceeding, R.10-12-007 by D.13-10-040.[4]

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[2] This proceeding was filed on November 8, 2012. A prehearing Conference was scheduled and held on March 13, 2013. To date there has been no scoping memorandum issued in this proceeding.

[3] *Rulemaking to Improve Distribution Level Interconnection Rules and Regulations for Certain Classes of Electric Generators and Electric Storage Resources*, filed September 22, 2011. An *Assigned Commissioner's Amended Scoping Memo and Request for Comments* was issued on September 26, 2012; and an *Administrative Law Judge's Ruling to (1) issue Working Group Paper on Autonomous Inverter Functionalities (2) Set Comment Dates and Workshop, (3) Enter Working Paper Into the Record, and (4) Announce New Rule 21 Working Group* was issued on June 11, 2013. Apart from a Prehearing Conference concerning admission into evidence of a document entitled "Smart Inverter Working Group Recommendations" that was scheduled and held on February 19, 2014, that has resulted in no subsequent rulings or other Commission action, there has been no significant activity in this proceeding on the record since June 2013.

[4] *Order Instituting Rulemaking Pursuant to Assembly Bill 2514 to Consider the Adoption of Procurement Targets for Viable and Cost-Effective Energy Storage Systems*, filed December 16, 2010, *Decision Adopting Energy Storage Procurement Framework and Design Program*, issued October 17, 2013.

II. EXEMPTIONS FROM INTERCONNECTION APPLICATION FEES, SUPPLEMENTAL REVIEW COSTS, DISTRIBUTION UPGRADE COSTS, AND STANDBY CHARGES FOR NET ENERGY METERING-ELIGIBLE GENERATION FACILITIES PAIRED WITH ENERGY STORAGE DEVICES ARE LEGALLY REQUIRED.

The Commission should clarify that as a matter of law, the statutory exemptions from interconnection application fees and other charges related to NEM-eligible generation facilities must also apply to all energy storage devices that fit the definition of an "addition or enhancement" under the seventh edition of the California Energy Commission's ("CEC's") *Renewables Portfolio Standard Eligibility Guidebook,* pursuant to Public Utilities ("P.U.) Code § 2827. Considering the illegality of denial of the benefits of P.U. Code § 2827, at a minimum, the Commission should direct the utilities to reimburse customers that have installed NEM-eligible systems for any interconnection application fees supplemental review fees, costs for distribution upgrades and standby charges related to interconnection applications submitted to the utilities after the effective date of the seventh edition of the CEC's *Renewables Portfolio Standard Eligibility Guidebook*.

III. THE COMMISSION SHOULD MODIFY THE SIZING CRITERIA TO NOT UNDULY CONSTRAIN CUSTOMER CHOICE AND STORAGE USE CASES

The Proposed Decision proposes a differentiation between systems < 10 kW and for systems > 10 kW, with specific sizing and metering conditions for each. CESA believes that the general approach applied is reasonable, however, constraining the discharge capacity of the storage system for systems larger than 10kW to the NEM generator's maximum capacity in an effort to ensure NEM integrity will substantially limit the available beneficial use-cases of the energy storage, while the original intent can be better met by other means. To address this CESA proposes a modest change to the sizing criteria applicable to systems greater than 10 kW as follows: NEM-eligible storage systems greater than 10 kW must be sized no larger than the

annual peak load of the host site served by the NEM-eligible generation facility with which the storage system is paired, and the paired storage device must deliver no more than 12.5 usable kilowatt-hours per kilowatt capacity.

The term "usable energy" is commonly recognized as taking into account the round trip efficiency and depth of discharge of energy storage devices. This approach is superior to others discussed in the Proposed Decision because it is grounded on established engineering practice and enables the greatest flexibility in operating schemes that can be designed to meet the widest variety of behind-the-meter customer needs and preferences. The several different operating scenarios it supports that are described in Appendix A graphically demonstrate that the Proposed Decision would adopt the optimum approach.

Customers should be able to choose among NEM-eligible generation facilities and energy storage devices that are sized to best technically and financially meet their on-site load requirements and their preferred method of operation. Given that such facilities and devices are part of a rapidly evolving area of emerging energy technology, there is no rational policy basis for determining a size limitation for equipment that meets the parameters of the NEM program established by law and the Commission's rules, orders, and decisions. The attempt to establish such a scheme of differentiation in the Proposed Decision at this stage of the growth of DG in California appears arbitrary, is counter-productive to robust market development, and should be abandoned by the Commission.

The physical layout or structural characteristics of the roof often constrain the maximum PV array which can be installed on a facility, whereas to provide the optimal benefit that the Commission envisioned the energy storage device may need to be sized for the peak load. Customers may expand on-site load over time (*i.e.* expanding facilities, adding appliances, or

integrating electric vehicles) and/or expand NEM-eligible generation. Size limits would prevent the installation of storage devices that could meet future on-site needs, whether through planned or potential expansion of generation or load. Given the potential costs advantages of upfront installation of larger on-site generators versus postponed expansion of smaller ones, this could reduce the ability of customer-generators to install reasonable resource sizes in the future. The extra capacity would also not be wasted in the interim: the energy storage device could simply provide a smaller capacity for longer duration. Commercially available storage control systems could limit resource discharge so as to not back-feed onto the grid; use of this equipment would be a far superior solution to sizing limits for preventing back-feeding.

It is well understood that the nature of ancillary services required by the California Independent System Operator ("CAISO") would make deployment of larger storage devices and aggregated networks beneficial to the overall grid. Storage can provide a number of grid services (*i.e.* black start and frequency regulation), and often do so at higher performance levels than conventional energy resources leading to greater grid efficiencies. Because such services can be very cost-effectively provided from DG, aggregated behind the meter storage devices, CESA recommends that the Commission explicitly recognize this as another justification for why storage devices should not be limited the size of a paired NEM-eligible generator.

IV. IN THOSE CIRCUMSTANCES WHERE THE COMMISSION BELIEVES THERE IS A REASONABLE RISK OF NEM GAMING, THE COMMISSION SHOULD RELY ON THE EXISTING METHODOLOGIES BUT ALLOW THE USE OF DEVICE INTERNAL METERING IN LIEU OF THE ALTERNATIVE FORMULA OR NET-GENERATION OUTPUT METER.

In those instances or scenarios where the Commission believes there is a need to impose additional requirements or methodologies to address NEM gaming risk, CESA requests that rather than adopt the formula proposed, that instead the Commission preserve the existing

approach under NEM-MT, but allow for the use of the metering equipment that is typically integrated into existing systems in lieu of the net generation output meter. While the inverters available on the market today may provide NEM-eligible generation data, most do not currently measure the energy into and out of the storage device in a manner useable for this calculation. Most installation topologies as outlined in Appendix A have some amount of downstream protected loads, as well as upstream non-protected loads served. The energy drawn by these loads will be indistinguishable from energy imported to charge the batteries or serve any other purpose, which will distort and invalidate the resulting de-rate Factor.

The proposed Decision recognizes that an interval meter connected directly to the NEM-eligible generation can readily ensure NEM integrity; this same methodology can be used for systems of all sizes and topologies without the need for external calculations. Currently there are established requirements and methods for confirming the output of NEM-eligible generation as established under existing programs; the integrated system production meter or meter system equipment used to determine renewable generation output can also be used to ensure NEM integrity. For NEM-eligible generation that would be exempt from Performance Monitoring and Reporting Service ("PMRS") requirement, the installed meter may be internal to the device connected directly to the NEM-eligible generator. Allowing the use of these integrated or device internal meters in lieu of the NGOM would dramatically reduce the cost and complexity of deploying NEM-eligible storage while fully addressing any NEM accounting issues. If the generation meter accumulated values are expressed in DC kWh as would be typical for DC Coupled PV as outlined in Appendix A the resulting output would be multiplied by the inverter's CEC weighted efficiency to determine the total renewable generation output.

V. STAND ALONE ENERGY STORAGE DEVICES AND NON-EXPORTING NEM-ELIGIBLE GENERATION FACILITIES PAIRED WITH STORAGE DEVICES SHOULD BE EXEMPT FROM INTERCONNECTION APPLICATION FEES, SUPPLEMENTAL REVIEW FEES, COSTS OF DISTRIBUTION SYSTEM UPGRADES, STANDBY CHARGES AND SUBJECT TO NON-DISCRIMINATORY METERING REQUIREMENTS.

As a matter of Commission policy, storage devices that are standalone or configured so that they do not export to the grid should enjoy the same exemptions that are available to NEM-eligible systems generally. The Proposed Decision should accordingly be clarified so that there is no implicit preference given one way or another among the variety of technological solutions that can be deployed in furtherance of the California's DG goals and Commission policy. Put differently, there should be no regulatory policy gap left in the tariffs applicable to DG that would penalize standalone storage and non-exporting NEM-eligible systems.

VI. TOTAL COSTS AND FEES FOR METERING REQUIREMENTS ASSOCIATED WITH NEM-ELIGIBLE FACILITIES PAIRED WITH STORAGE DEVICES SHOULD NOT EXCEED $500.

Unlike the situation with the question of whether different sizing requirements should apply to NEM-eligible systems on the basis of size, there appears to be industry consensus that the $500 cap on metering costs and fees as described in the Proposed Decision is fact-based and reasonable at this time. In the context of the Proposed Decision and current industry circumstances, CESA supports the proposed cap.

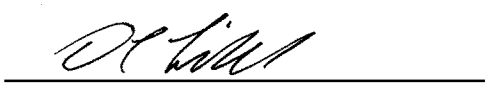
VII. THE DEADLINE FOR SUBMITTING INCENTIVE CLAIM APPLICATIONS FOR PROJECTS CURRENTLY HOLDING A CONFIRMED RESERVATION SHOULD BE ADJUSTED TO 120 DAYS AFTER THE LATEST PAYMENT CLAIM FILING DATE FOR A CONFIRMED RESERVATION.

CESA supports the 120-day extension for claim applications described in the Proposed Decision.

VIII. CONCLUSION.

CESA thanks the Commission for the opportunity to submit these comments on the Proposed Decision.

Respectfully submitted,



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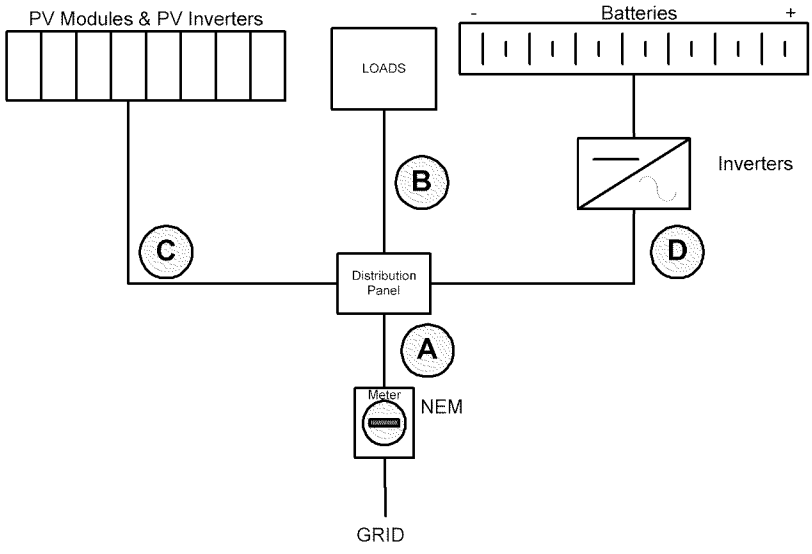
May 5, 2014

APPENDIX A
NEM Configurations with Energy Storage

The following NEM enabled configurations with Energy Storage are very likely to be seen. Following is a short discussion of each on how/why they will be impacted by the Proposed Decision. All diagrams are simplified for clarity of discussion on services and sizing.

Load-Leveling Storage with Premise PV and Loads

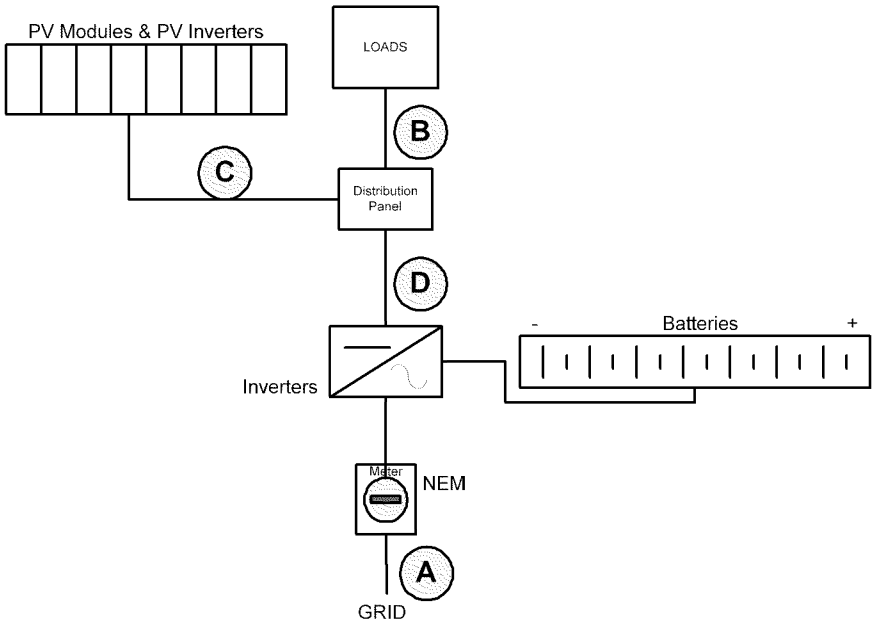


In this configuration the storage system (such as a stationary battery or vehicle-to-grid-equipped vehicle) is purposed to provide load leveling, peak management services, or demand response services. It is NOT configured for enhanced reliability/backup or operation as a generator on the CAISO system.

The power/energy appearing at the grid connection equals B minus C plus D (although D may be a positive or negative number).

As PV Generation power (C) is fixed, and NEM solar systems are generally sized such that peak load power (B) is greater than or equal to the peak solar generation, then ***to be most effective the storage power (D) needs to be able to be sized to as large as Load (B), NOT limited to the size of the PV Generation (C) as currently proposed***. For behind-the-meter storage systems focusing on reducing shorter-duration peaks, 1-2 kWh per kW of usable energy should be sufficient.

AC Coupled Storage Added to Premise PV and Loads

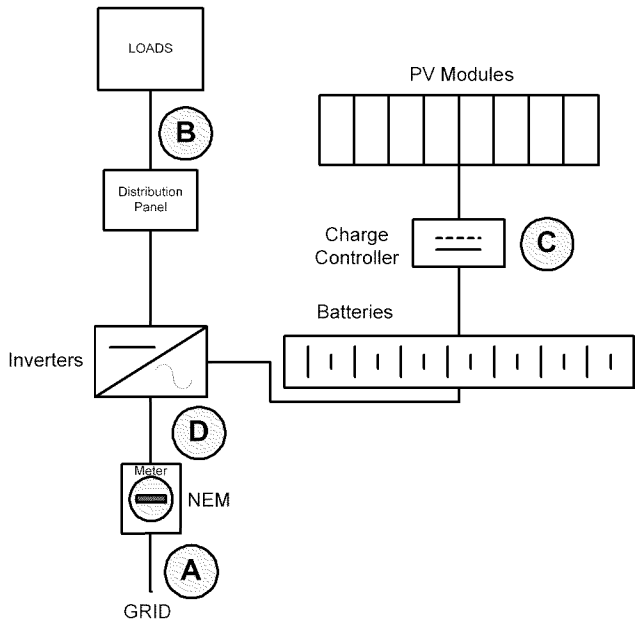


In this configuration the storage system is purposed to provide a variety of services including reliability enhancement/backup, load leveling, demand response, or peak management services. It is NOT configured to operate as a generator on the CAISO system due to jurisdictional conflicts and accounting issues surrounding the mixing of wholesale and retail energy purchases behind a NEM.

The power/energy appearing at the grid connection equals B minus C minus D (although D may be a positive or negative number).

As PV Generation (C) is fixed and loads (B) are greater than or equal to the generation then ***to be most effective the storage power (D) needs to be able to be sized to as large as Load (B), NOT limited to the size of the PV Generation (C) as currently proposed***. Hours of usable energy need to be higher here as the desired purposes of peak management, **load shaping and reliability require more hours of usable energy (4 to 20 kWh per kW)**.

DC Coupled PV and Storage to Premise Loads

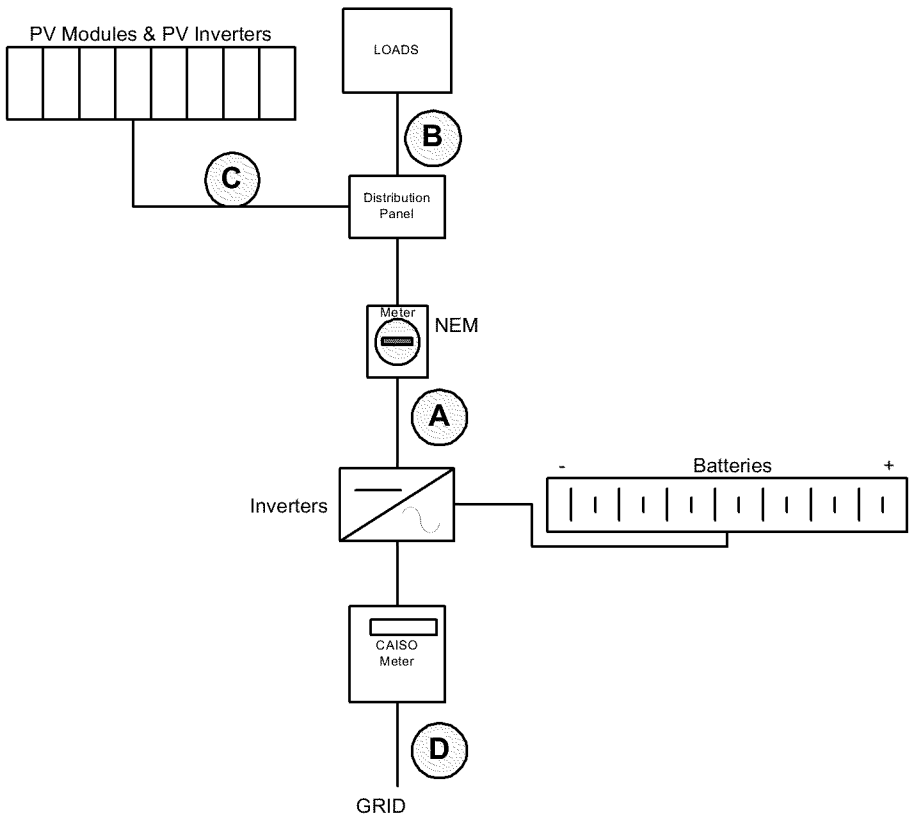


In this configuration the storage system is purposed to provide a variety of services including reliability enhancement/backup, load leveling, demand response, or peak management services. It is NOT configured for operation as a generator on the CAISO system due to jurisdictional conflicts and accounting issues surrounding the mixing of wholesale and retail energy purchases behind a NEM.

The power/energy appearing at the grid connection (A) equals B plus D (although D may be a positive or negative number).

As PV Generation (C) is fixed and loads (B) are greater than or equal to the generation then ***to be most effective the storage power (D) needs to be able to be sized to as large as Load (B), NOT limited to the size of the PV Generation (C) as currently proposed***. Hours of usable energy need to be higher here as the desired purposes of peak management, **load shaping and reliability require more hours of usable energy (4 to 20 kWh per kW)**.

Battery in Series with NEM for Ancillary Services and local service reliability



In this configuration the storage system is purposed to provide a variety of services including reliability enhancement/backup, load leveling or peak management services for the utility and to be able to provide ancillary services. The NEM is configured on the OUTPUT side of the battery inverter system. In this configuration grid outages seen at D are handled with service continuing to the Customer with energy and power delivered from the storage system.
A CAISO meter is in series with the battery and would need to be configured to measure ONLY the net load of the battery to avoid double charging for the same energy. It is capable of operating on the CAISO system as a generator (per FERC 792). Energy released form the battery to serve the loads when the grid is unavailable will get charged to the customer via the NEM at retail and replacement energy taken from the Solar PV would be credit to the customer at retail and stored in the storage until the grid returns thereby avoiding conflict in retail value of solar and load.

The power/energy appearing at the grid connection equals B minus C. Point D would equal A plus or minus the storage activity.

As PV Generation (C) is fixed and loads (B) are greater than or equal to the generation then ***to be most effective the storage power (D) needs to be able to be sized to at least as large as Load (B), NOT limited to the size of the PV Generation (C) as currently proposed***. Hours of usable energy need to be higher here as the desired purposes of **reliability require more hours of usable energy (4 to 20 hours) while the ancillary services require 0.25 -4 kWh per kW of usable energy**.