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 POWERTREE SERVICES INC. ON PROPOSED DECISION REGARDING NET ENERGY METERING INTERCONNECTION ELIGIBILITY FOR STORAGE DEVICES PAIRED WITH NET ENERGY METERING FACILITIES

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TABLE OF CONTENTS

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Powertree Services Inc. ("Powertree")[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.

Powertree strongly supports the Proposed Decision, and also makes certain recommendations for revisions discussed below. Powertree urges the Commission to adopt in a final decision as soon as possible to streamline and expedite administration of the Commission's net energy metering ("NEM") program and Self Generation Incentive Program ("SGIP"). Powertree also supports the California Energy Storage Alliance's ("CESA's) recommendations in its Comments filed on this date, and concurs that the Commission should promptly issue a scoping memorandum, or comparable ruling (i) in this proceeding and (ii) in the Commission's open distributed generation ("DG") interconnection proceeding, R.11-09-011.

[1] A description of Power Tree is set forth in Power Tree's Motion for Party Status filed along with these comments.

II. THE COMMISSION SHOULD MODIFY THE SIZING CRITERIA TO AVOID UNDULY CONSTRAINING CUSTOMER CHOICE AND STORAGE USE CASES, INCLUDING THOSE FOR ELECTRIC VEHICLE CHARGING SUPPORT

The Proposed Decision is consistent with the "rule of thumb" based on peak load and usable energy storage capacity advocated for by CESA. The term "usable energy" is commonly recognized as taking into account the round trip efficiency and depth of discharge of energy storage devices. The several different operating scenarios it supports that are described in Appendix A graphically demonstrate that the Proposed Decision would adopt the optimum approach.

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.

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.

Electric Vehicle ("EV") charging as a key infrastructural element called for in achieving the states' greenhouse gas ("GHG") reduction goals is impacted in the Proposed Decision in that stationary storage paired with onsite DG is a key technique for enabling the expansion of charging facilities of adequate power while keeping operational costs low and reducing the amount of grid infrastructure upgrades required to accommodate these new loads. By placing stationary storage in conjunction with on-site generation the peak loads of EV charging (ranging from 1.5KW to 50KW per vehicle depending on model) can be averaged over time by low rate of charge from the DG and/or grid yet supporting the higher currents from the storage device to meet the fastest possible refueling needs of the EV. To accomplish this it is essential that the storage device be capable of discharging to meet the peak loads from the EVs without placing undue strain or overload on the grid. This will reduce potential ratepayer costs when installing EV charging systems by reducing the amount of rate infrastructure upgrades added to rate base since such upgrades can be avoided by the use of the storage device at the customer's premise.

III. THE COMMISSION SHOULD ESTABLISH A PRESUMPTION THAT NEM INTEGRITY REQUIREMENTS ARE MET IF THE POWER CAPACITY IN KW OF THE ENERGY STORAGE DEVICE PAIRED WITH A NEM-ELIGIBLE GENERATION FACILITY IS NO GREATER THAN THE PEAK LOAD OF THE HOST SITE SERVED BY THE FACILTY AND THE DEVICE DISCHARGES NO MORE THAN 12.5 KILOWATT-HOURS OF USABLE ENERGY PER KILOWATT CAPACITY.

Powertree submits that the risk of NEM gaming should be assumed to be *de minimus* for all NEM-eligible storage devices, so long as the device meets the sizing criteria that are

applicable to systems greater than 10 kW, and thus no additional metering requirements or adjustment to NEM credits should be required.

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 A FORMULA OR NET-GENERATION OUTPUT METER.

The Commission should preserve the existing approach under NEM-MT, but allow for 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 described 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 the 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. THE COMMISSION SHOULD CLARIFY HOW MIXED USE METERING SHOULD BE CREDITED ESPECIALLY IN THE CASE OF THE PROVISION OF ANCILLARY SERVICES TO THE CAISO OR UTILITIES CONCURRENT WITH ON PREMISE NEM ELIGIBLE LOAD AND GENERATION.

Use of grid-tied energy storage whether from stationary storage or EVs to support grid efficiency via fast response ancillary services such as regulation, etc. is highly desirable. Not only does this aid in the reduction of GHG by reducing the need for fossil powered peaker plants but it aids in the management of the grid as a whole. Typically, to achieve this at the customer site both aggregation and service at the customer site or distribution level is required. This has led to uncertainty as to proper billing treatment of energy generated by on-site generation where some utilities have indicated that when energy is placed in the battery it is no longer subject to receiving credits at retail, contrary to NEM, or that any energy released from storage should be uncompensated. As these positions are highly negative to the economics of operation and to the intent of the Commission to incent these uses it is critical that the proper accounting treatment in such cases be defined by the Commission in its final decision.

From our experience, Powertree recommends the configuration described in Appendix A as "Battery in Series with NEM for Ancillary Services and local service reliability" as it clearly demarcates the energy measurement and billing points where retail loads and charges are applied and where wholesale services such as ancillary services can be delivered without undue imposition of costs or loss of proper credits for NEM-eligible generation as is on site. Key to

this is that the storage device must be allowed to export to grid in response to a control signal *and that such exports be netted against usage economically and that charges for "Standby Power" or additional demand capacity not be imposed as barriers to successful Ancillary services provision to the grid.* FERC Order No. 792 has recognized this in requiring that energy storage be treated as generation for the purpose of interconnection and as such not be subject to facility or demand charges as if it were load. It is important that Commission goals be in alignment with such federal rules to avoid creating a roadblock to uses desired by the State.

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, Powertree 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.

Powertree urges that any projects for which interconnection has been delayed and which are carrying a current confirmed SGIP reservation be extended by *at least* 120-days beyond the current latest possible submission date (initial period plus two extensions) to allow for catch up and completion of work that may have been suspended due to interconnection delays. Many Powertree projects have been in progress since 2012 and have yet to be approved for

interconnection, and this extension will allow necessary time for completion in the Proposed Decision.

VIII. CONCLUSION.

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

Respectfully submitted,

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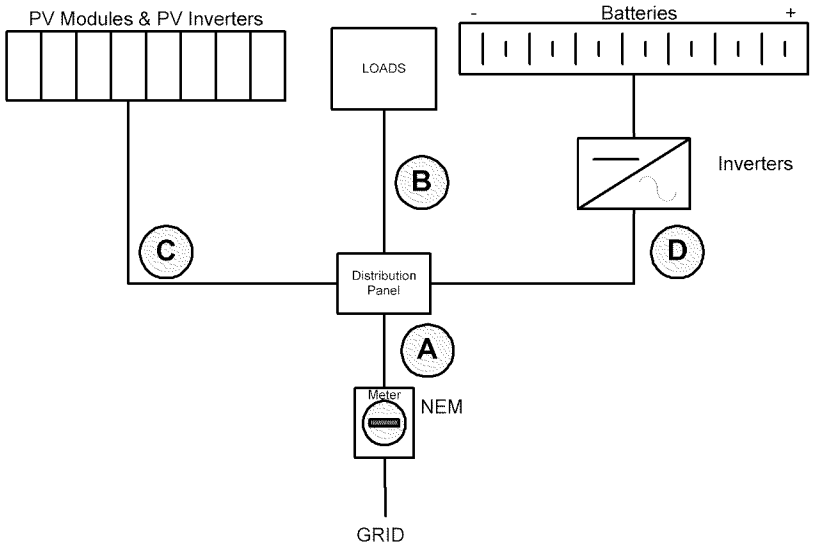
May 5, 2014

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

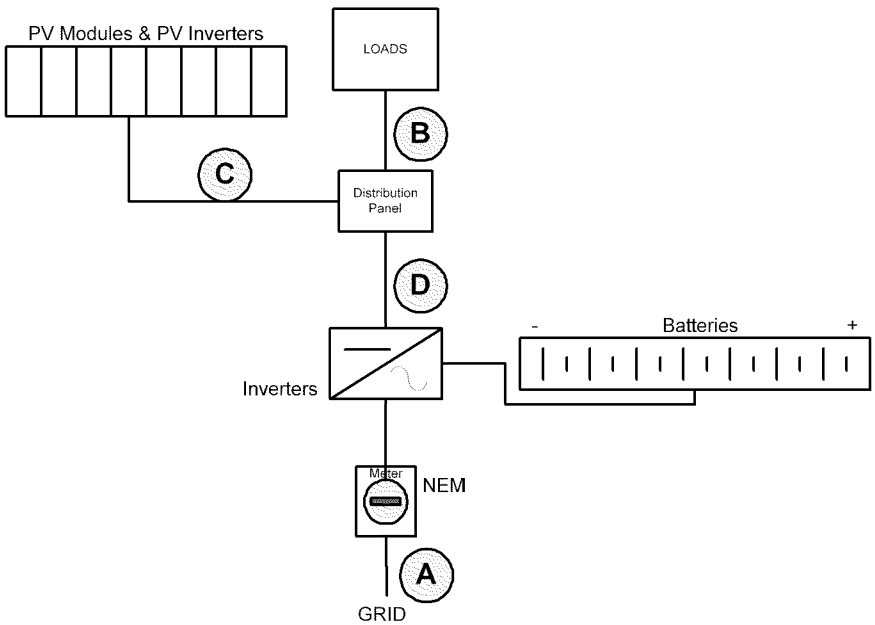


In this configuration the storage system (such as a stationary battery or vehicle-to-grid-equipped vehicle) is purposed to provide load leveling, peak management services, or demand response services. It is NOT configured for enhanced reliability/backup or operation as a generator on the CAISO system.

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

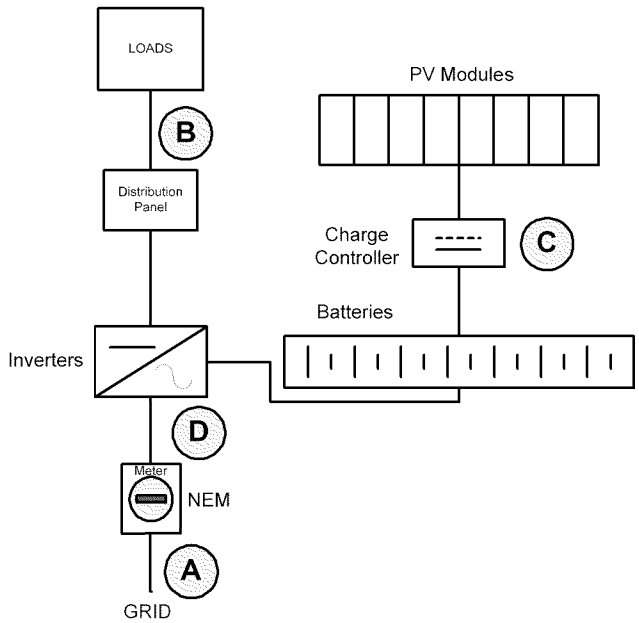


In this configuration the storage system is purposed to provide a variety of services including reliability enhancement/backup, load leveling, demand response, or peak management services. It is NOT configured to operate as a generator on the CAISO system due to jurisdictional conflicts and accounting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

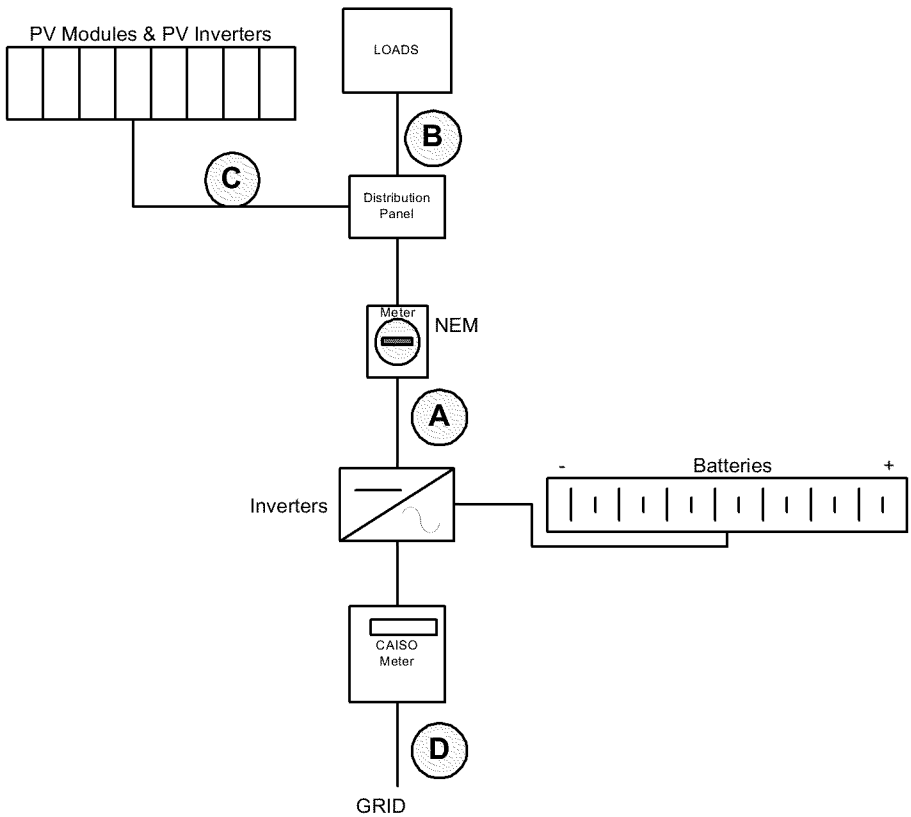


In this configuration the storage system is purposed to provide a variety of services including reliability enhancement/backup, load leveling, demand response, or peak management services. It is NOT configured for operation as a generator on the CAISO system due to jurisdictional conflicts and accounting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