

**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 SOLARCITY CORPORATION ON THE
ASSIGNED COMMISSIONER'S RULING REGARDING
INTERCONNECTION OF ENERGY STORAGE SYSTEMS
PAIRED WITH RENEWABLE GENERATORS ELIGIBLE
FOR NET ENERGY METERING**

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Pursuant to the *Assigned Commissioner’s Ruling Regarding Interconnection of Energy Storage Systems Paired with Renewable Generators Eligible for Net Energy Metering* (ACR) issued on October 17, 2013, SolarCity Corporation (SolarCity) respectfully submits these comments in support of the ACR. The ACR identifies a threshold issue of legal significance concerning the interconnection of storage devices paired with net energy metering (NEM) systems, and SolarCity provides these comments to address several practical considerations for implementing compliance with this legal requirement.

SolarCity appreciates the Commission’s recognition through this ACR that interconnection costs resulting from the investor-owned utilities’ (IOUs) treatment of storage devices paired with renewable energy systems under the NEM program are currently impeding timely installation of customer-sited storage devices. The ACR makes clear that the exemption from interconnection and other costs that NEM systems enjoy under California Public Utilities Code § 2827(g), as further clarified by the Commission in Decision (D.) 02-03-057, should also apply to storage devices that satisfy the conditions to be deemed an “addition or enhancement” to a renewable electrical generation facility, as established in the most recent version of the

California Energy Commission (CEC) Renewables Portfolio Standard Eligibility Guidebook (RPS Guidebook) . SolarCity believes that this legal issue should be addressed in an expedited manner and encourages the Commission to provide direction to the IOUs to extend the exemption from interconnection and other costs to qualifying storage as soon as possible.

In addition to recognizing the threshold legal matter, the ACR raises a number of practical and technical questions that are certainly capable of resolution within an expedited timeframe for providing a final decision. SolarCity agrees that the Commission should consider alternative and less costly approaches to address concerns related to NEM accounting, considering technical factors, the actual level of risk that NEM “gaming” will occur, and the costs of metering and other solutions that might be employed to mitigate that risk.

As the Commission moves forward with its consideration of these various issues, it is important to note that resolution of some of these issues, particularly those related to metering and NEM accounting, may involve more complicated technical considerations. These issues do not need to be resolved in order for the Commission to first recognize the legal right of NEM customers with storage to be exempt from interconnection and other charges pursuant to the statutory protections afforded under the NEM program. Consideration of these other technical issues should not delay a Commission decision on this threshold legal matter. In fact, as discussed below, we believe the CEC already resolved this issue when it adopted its most recent version of the RPS Guidebook.

I. The ACR Provides an Efficient Mechanism to Resolve the IOU’s Legally Deficient Treatment of Storage Systems Paired with NEM.

The current practice of the IOUs to require customers with NEM-paired storage devices to pay for interconnection costs is legally deficient where those systems meet the CEC conditions to constitute an “addition or enhancement.” The CEC clarified in April 2013, with the publication of its most recent RPS Guidebook, that storage paired with a renewable electrical generation facility could qualify as an “addition or enhancement” and, thus, be considered a part of that facility. This clarification, standing alone, carries with it the legal effect the ACR now

seeks to memorialize: storage devices that satisfy the CEC’s conditions for an “addition or enhancement” are a part of the eligible customer-generator facility and have the protection of Public Utilities Code § 2827(g), including exemption from interconnection and other costs. The IOUs refusal to recognize the legal significance of this clarification, and the impact of that refusal on the costs associated with interconnecting storage devices paired with NEM systems, runs afoul of state-law protections for eligible customer-generators against interconnection costs.

SolarCity, and other parties, expected that the CEC’s clarification would provide a sufficient impetus for the IOUs to modify their practice of assessing interconnection costs to storage devices that met the CEC’s conditions, as it is unambiguous that those devices are now legally considered a part of the facility that constitutes an eligible customer-generator. Accordingly, there is no basis to treat storage devices that meet the CEC’s conditions distinct from the customer-generator facility. After the CEC made this clarification, SolarCity moved forward with interconnection requests that meet the CEC’s conditions.

The IOUs to this point in time, however, have been recalcitrant and have refused to process these applications consistent with the law. Instead, the IOUs have insisted that these systems may only request interconnection under the “Multiple Tariff” condition on the IOUs’ respective NEM schedule and must submit the \$800 interconnection application fee specified in Rule 21. Despite SolarCity’s explanation to the IOUs of the significance of the CEC’s clarification in incorporating qualifying storage devices within the protections provided to NEM systems in § 2827(g), the IOUs have refused to adapt, necessitating the issuance of the ACR. The IOUs’ unwillingness to recognize the legal significance of the CEC’s clarification has caused hundreds of its storage projects to stall indefinitely, causing the company to face potential financial losses and to risk harming the goodwill we have cultivated with our customers.

SolarCity has made good faith efforts to encourage PG&E¹ and SCE² to cure this legal deficiency through informal processes, but those efforts have, unfortunately, not been fruitful.

While SolarCity stands ready to redress its grievances through the Commission's formal complaint process, SolarCity applauds the ACR as a more efficient and practical means of achieving IOU compliance with the law without having to litigate potentially hundreds of fact-specific disputes.

II. For Storage Devices that Meet CEC Criteria, the IOUs Should Not Delay Recognizing Exemptions from Interconnection Costs Until a Final Decision Is Issued.

SolarCity appreciates the ACR's recognition that current IOU practice in regards to NEM-paired storage devices are a barrier to development and agrees that the remedies developed should not prejudice customers' ability to participate in programs, including the SGIP. The timeframe for coming to a final decision on this matter, however, is unclear and continuation of the IOUs' current practice of requiring qualifying storage devices to submit an \$800 interconnection application fee will arbitrarily stifle market growth for, foreseeably, many

¹ On August 8, 2013, SolarCity sent a letter to PG&E, through undersigned counsel, requesting that PG&E reevaluate its earlier decision to require SolarCity to remit an \$800 interconnection application fee for five of its NEM-paired storage applications, based on the CEC's clarification of "directly connected" storage as a part of the same renewable electrical generation facility. Stacy Walter of PG&E's Law Department responded on August 15, 2013 disputing that the CEC Clarification had this effect and arguing, in part, that the Rule 21 proceeding (R.11-09-011) was already addressing these storage-related issues. SolarCity sent another letter in response to Ms. Walter's letter, once again urging PG&E to modify its practices to recognize the CEC's clarification, on August 27, 2013, and expressing its desire to avoid formal Commission action to resolve the dispute.

² On August 13, 2013, SolarCity sent a letter to Julian Ramirez, SCE's Grid Interconnection Project Manager, that had substantially the same content as SolarCity's letter to PG&E. On September 3, 2013, Matthew Dwyer, Attorney for SCE, responded to SolarCity's letter, also disputing the effect of the CEC's clarification in regards to the exemption from interconnection charges for eligible customer-generators. SolarCity sent a response letter to SCE on September 6, 2013, requesting that SCE reconsider its interpretation of the effect that the CEC's clarification has on NEM-paired storage interconnection requests. SolarCity, again, expressed its desire to avoid having to involve the formal Commission process to resolve this dispute.

months to come, and adversely impact project economics. Given concerns about customer attrition, the broader implications on the development of the storage market, and in the face of ongoing utility recalcitrance to acknowledge their legal and regulatory obligations, companies may feel they have no choice but to move forward with filing interconnection requests inclusive of the \$800 fee. SolarCity encourages the IOUs to act immediately to cure the legal deficiency by extending treatment as an eligible customer-generator to storage that is “directly connected to” a NEM systems and by refraining from requiring these systems to submit an application fee. Any application fees received by the IOUs as part of an interconnection request for storage systems that meet the CEC definitions of an addition or enhancement and that have been submitted to the IOUs since the CEC adopted the current version of the RPS Eligibility Guidebook should be returned to applicants as soon as possible.

III. Preserving the Integrity of Net Energy Metering Accounting

SolarCity agrees with the ACR that “preserving the integrity of NEM is an important goal...”. [p.5] As the ACR notes, it is important for NEM-paired storage systems to be “configured and metered in order to ensure that NEM credit can only be generated by the eligible renewable electric generation facility.” [p.5] SolarCity does not object to the ACR’s proposal that “paired generation and storage devices should generally continue to adhere to the metering requirements stipulated in the Multiple Tariff portion of the NEM schedule.” [p.6]. In fact, this practice is consistent with SolarCity’s proposed configurations that the IOUs have refused to process under the NEM schedule without imposing a special Multiple Tariff condition and an \$800 interconnection application fee. For SolarCity, this configuration—utilizing Net Generation Output Metering (NGOM) —was chosen out of an abundance of caution to provide absolute assurance that the integrity of NEM accounting would be preserved.³

³ For reference, in Attachment A, SolarCity provides simplified schematics illustrating two configurations for customer-side storage-paired-with-photovoltaics.

In order to minimize meter and other related costs⁴, we request that the Commission require the IOUs to allow the use of a more cost-effective smart meter for net generation output metering and impose a cost cap (e.g., \$400) for all fees associated with the smart meter. PG&E has quoted SolarCity approximately \$400 for the cost of a smart meter, including “cost of ownership” charge and a “contributions in aid of construction” tax. This compares with a total cost of \$1548 for a non-smart meter NGOM.⁵

SolarCity appreciates the ACR’s recognition that there will be circumstances where storage and a NEM generating system may be located behind a single inverter and that NGOM is incapable of being used to ensure NEM integrity. The ACR raises a number of questions related to NEM accounting, involving the context where an NGOM cannot be installed, that SolarCity addresses in turn here:

- *For single inverter systems, or other system configurations that do not allow NGOM, should the Commission consider estimated NEM generation as a means to limit NEM export credits during peak periods?*

SolarCity believes that an estimation methodology could be pursued in lieu of metering, recognizing, that different methodological approaches present different trade-offs. At this time SolarCity does not endorse a particular estimation methodology. Instead we present two different approaches that could be considered (see next page).

⁴ In addition to the cost of a meter, IOUs also require a “cost of service” fee and collect a federal tax.

⁵ SolarCity notes that many inverters that are currently being deployed contain internal metering that could also be used instead of and at considerably lower cost relative to an NGOM meter.

Estimation Method	Description
Device internal measurement of RPS eligible generation	NEM export credits would be limited by an inverter internal measurement instead of a standalone NGOM. In the case of a single inverter system, the power flow of the battery and the PV are typically still segregated and measured separately at a point in the DC conversion stages. The PV only generation at the AC output could be derived based on the CEC rated DC-to-AC efficiency of the system. The inverter internal measurements would be reported to the utility for NEM billing purposes in a manner similar to how PBI solar production is reported in the CSI program.
Annual estimate of RPS eligible generation	NEM export credits are limited to an annual estimate of RPS eligible generation. In the case of PV, the annual estimate could be derived from the CSI EPBB Calculator, which accounts for individual system location, specifications, typical annual weather, and shading.

This is not intended to be a comprehensive list of potential estimation options, as there are likely other approaches that merit consideration. In the event an estimation methodology is ultimately adopted, SolarCity encourages the Commission to consider allowing all projects to opt in to an estimation regime in lieu of installing costly metering.

- *Storage devices sized below a certain limit could pose a de minimis risk of harming NEM integrity. Should the Commission consider a threshold storage capacity below which NGOM is not required for the NEM generator? If so, what is an appropriate threshold and should the threshold be based on absolute capacity or in relation to customer load and the NEM generator capacity?*

SolarCity agrees that certain storage systems pose a de minimis risk to the integrity of NEM accounting, which does not justify the costs of deploying necessary metering or applying other solutions. For example, in instances where storage system capacity size (in kW) is less than historical base load, storage is highly unlikely to have the physical opportunity to export and no NGOM nor estimation is required to ensure NEM integrity. Where storage systems have a

lower rated power than a customer's base load (i.e., minimum load) those systems would never export to the grid because any discharge from the battery would be used at all times to meet the on-site loads.

Systems deployed with several of SolarCity's commercial class customers are a good example of this. As one example, a storage device utilized by a large commercial customer is only rated at 30 kW, which constitutes a small fraction of the total load at that site. Even if there were no PV generation—and the storage system was outputting at full power—the site would still not be exporting any energy to the grid. Alternatively, SolarCity suggests that Rule 21 non-export screen (screen I) could serve a similar function of eliminating NGOM requirements where it is not necessary. This would apply where storage system size (not the PV system size) is less than or equal to 50% of the verifiable minimum load over the previous 12 months.

In any event, if storage system size is less than 30 kW, an estimation method should be an acceptable means of protecting NEM integrity. Thirty kW is consistent with system size breakpoints used in the SGIP Handbook and systems that are less than 30kW are already exempted from the expensive metering and performance monitoring requirements in place for larger systems under SGIP. The variance between an estimated and metered PV production for storage systems smaller than 30kW are likely to be very small and would not pose a significant threat to NEM integrity. In contrast, the cost of metering these smaller systems is high enough that it could pose a significant barrier to adoption. Estimation should be an acceptable alternative to metering in these cases.

- *Because storage devices increase total consumption, customers on non-time-varying rates have no financial incentive to export energy for NEM credit, should NGOM be required for customers who are not on time-varying rates?*

SolarCity agrees that under non-time variant rates there is no incentive to export energy to the grid since there is no arbitrage opportunity. As noted by the question, using the storage device to export energy for NEM credit under a non-time variant rate would appear to be a losing proposition for the customer given efficiency losses. Accordingly, given the absence of any

incentive to export grid energy in these circumstances there is no need for an NGOM meter requirement for customers taking service under non-time-variant rates. SolarCity would agree, however, that it may be appropriate to require additional metering or other approaches to address arbitrage if a customer subsequently decides to go onto a time variant rate and that a sufficient off/on peak differential exists to render “gaming” economic, taking into consideration efficiency losses and the impact on battery performance; we do not believe such a differential exists today under TOU rates. That said, SolarCity believes that the imposition of metering or other requirements should be pursued only in circumstances where there is an economic case to be made that gaming of the NEM program will occur.

There is no indication that load shifting through energy storage is an economic opportunity given the differential in peak vs. off-peak time-of-use rates. The technical capability of a storage system to export grid power is not, in and of itself, sufficient basis to establish costly metering or other requirements. In the end, the costs of any such mandate must be balanced against the likelihood of gaming . Given the current costs of storage and the existing rate environment, the economic incentive simply does not exist to engage in the gaming behavior at issue.

IV. Exemption from Interconnection Application Fees, Supplemental Review Costs, and Distribution Upgrade Expenses Is a Statutory Requirement.

SolarCity appreciates the ACR as the means to bring about IOU compliance with the law, but we note that the requirement to provide an exemption from interconnection charges to customer-generators is rooted in statute and that the CEC’s Guidebook served to clarify the reach of that statute to include properly configured NEM-paired storage systems. The statutory language in § 2827(g) is clear that an eligible customer-generator (i.e., a NEM facility) is exempt from various fees and charge to which the customer would not otherwise be subject.⁶ Given the

⁶ “Any new or additional demand charge, standby charge, customer charge, minimum monthly charge, interconnection charge, or any other charge that would increase an eligible customer-generator’s costs beyond those of other customers who are not eligible customer-generators in the rate class to which the eligible customer-generator would otherwise be assigned if the customer

statutory basis of this exemption, SolarCity cautions that it would be inappropriate and possibly inconsistent with the statute for the Commission to attempt to rescind the exemption from interconnection charges after expiration of the ACR’s interim period at the end of 2015. The CEC Guidebook merely clarified that NEM-paired storage falls within the **existing** protections of the statute and the Commission may not, absent future legislative action, selectively apply the provisions of the NEM statute based on the technology or cost of any particular customer-generator.

In terms of applicability of the law to NEM-paired storage, the only pertinent question to ask is whether a storage system meets the CEC’s criteria for deeming a storage device an addition or enhancement to a NEM eligible system. SolarCity’s systems conform to the CEC’s classification of storage as an “addition,” in Section III.G.2 of the Guidebook:

“An energy storage device not integrated into the operations of a renewable electrical generation facility and able to receive inputs from other sources is an **addition** to the renewable electrical generation facility if the energy storage device and the renewable electrical generation facility are both:

- a) Directly connected. [*citation omitted*]
- b) Operated as part of the same RPS eligible electrical generation facility.”⁷

The energy storage devices that SolarCity has put forward for interconnection applications with the IOUs satisfy the CEC’s criteria and should be exempt from interconnection charges. First, SolarCity’s energy storage devices are directly connected to the PV system—which the RPS Guidebook indicates is satisfied by an internal power line on the generator’s side of the meter—and is operated as part of the PV system, as it is at times charged by either the PV system or the grid and are then used by the onsite customer to serve onsite load. In order to

did not own, lease, rent, or otherwise operate a renewable electrical generation facility is contrary to the intent of this section, and shall not form a part of net energy metering contracts or tariffs”.

⁷ *Renewables Portfolio Standard Eligibility Guidebook, seventh ed.*, CEC 300-2013-005-ED7-CMF, at p. 65, available at www.energy.ca.gov/2013publications/CEC-300-2013-005/CEC-300-2013-005-ED7-CMF.pdf (approved April 30, 2013 and issued May 17, 2013).

provide absolute assurance to the IOUs that only the PV portion of the facility can receive NEM credit for exports, SolarCity voluntarily proposed to use a Net Generation Output Meter configuration that goes beyond what is normally required for a NEM system. This configuration is also consistent with the CEC's guidance on storage as an addition.

Because SolarCity's storage systems meet the criteria the CEC has established in order to deem the device an addition, we wholeheartedly agree with the ACR's position that these systems should be exempt from interconnection application, supplemental review, distribution upgrade, and standby charges. The exemption is good public policy and consistent with the Commission's recent emphasis on promoting market transformation for energy storage. More importantly, the exemption is a legal requirement for facilities that constitute an eligible customer-generator, a classification that NEM-paired storage satisfies under the CEC's Guidebook.

Notwithstanding our concerns above, should the Commission decide to move forward with suspending the statutorily required exemption from these costs after December 31, 2015, we request that the language be modified such that the exemption would apply to all systems that *apply* for interconnection prior to December 31, 2015 rather than those systems that have "[connected] by" that date.

V. Safety Issues

SolarCity wholeheartedly agrees with the ACR that "storage devices must continue to meet the technical and safety standards required for participation in SGIP and interconnection under Rule 21." [p.8]. We note, however, that despite the demonstrated compliance of SolarCity's storage projects with these requirements, Southern California Edison has indicated that it may not approve our projects for interconnection on the basis of unsupported concerns related to customer safety. At the core of SCE's concern is the notion that a customer could tamper with the system rendering it unsafe. SCE has not claimed that the configuration of

SolarCity’s proposed projects are unsafe or fail to meet all applicable safety standards. Rather they allege that they could be rendered unsafe if a customer was determined to tamper with the system in an effort to bypass certain safety features. Not only is this concern unfounded, it appears to hold storage to a higher standard than other interconnected electrical devices, none of which are immune from customer tampering. SolarCity has found itself in an endless “do loop” with SCE engineers that borders on the Kafkaesque. Absent Commission intervention, SolarCity is concerned that SCE will continue to use dubious safety claims to prevent the interconnection of storage devices that meet all applicable safety standards and requirements, to the significant detriment of customer choice and the nascent storage market.

VI. System Sizing Requirements

SolarCity disagrees with the proposal in the ACR that would establish a rule by which the size of storage systems that are additions or enhancements to a NEM facility is capped consistent with the requirements of the SGIP Handbook, regardless of whether those storage systems receive SGIP incentives. As the ACR states:

“Advanced Energy Storage projects coupled with generation technologies must be sized no larger than the rated capacity of the PV or SGIP eligible technology it is operating in concert with. When coupled with a PV system, the rated capacity of the AES system can be no larger than the CEC-AC rating of the PV system, which is the rated AC output of the PV system including inverters.”[p.9]

SolarCity disagrees that this proposal is consistent with the SGIP Handbook. In particular, the SGIP Handbook provides that systems receiving a rebate for less than or equal to a 5kW system are exempt from system sizing requirements.⁸

SolarCity suggests that a similar exemption is warranted and justified this case. Particularly, it is not necessary for battery systems under 10 kW (AC) to be constrained by the

⁸ *2013 Self-Generation Incentive Program Guidebook*, at p. 49 (February 2013), available at www.cpuc.ca.gov/NR/rdonlyres/0DDABA86-9DF1-41C7-AD08-FF5B255155FA/0/2013_SGIP_Handbook_v1.pdf.

PV system size on a given site. This exception would be practical and would reflect the reality on the ground that there are very few storage system sizes that are currently commercially available below that size. For example, the smallest lithium ion system size that is commercially available is 4.5 kW [citation?]. Customers should not be limited in their ability to adopt storage technology because their roof was too small to fit more than 4.5kW of PV. This limitation would prevent over 120 of SolarCity's current projects incorporating batteries from interconnecting (some of which have already been installed awaiting interconnection).

It is reasonable that the same type of exemption from system sizing requirements present in the SGIP Handbook should apply for the purposes of interconnection to prevent exploitation of this NEM exemption but to ensure that storage technologies are available to as many customers as possible. SolarCity believes that storage technologies should not be limited in availability to only customers with large PV systems (more likely to be customers with large homes and large loads) but that the technology should be available to a wide range of residential customers.

VII. SGIP Deadline Extensions

SolarCity appreciates the ACR's attempt to preserve the ability of systems to participate in SGIP, even where systems might exceed deadlines for interconnection and trigger termination provisions by waiting on a final decision on the ACR issues. To address this problem, the ACR directs the IOUs to extend the SGIP deadlines for projects that have SGIP applications that would expire between when the ACR was issued and when a decision is issued to 14 days after the decision issue date. SolarCity supports the idea of an extension, but is concerned that additional time will be required. It will undoubtedly take more than 14 days to reconfigure projects based on any new requirements or guidance in the decision, to submit or resubmit interconnection applications to the IOUs, and await their review and approval (notwithstanding any back and forth) .

SolarCity requests that the SGIP extension last between 120 and 180 calendar days from the final decision that resolves the issues presented in the ACR. In our experience developing projects, this amount of time is reasonable and recognizes that after the decision is issued, projects will need to be permitted, installed, inspected and interconnected. A four to six month extension past the date of adoption is reasonable and necessary to realistically preserve the ability of these projects to fully interconnect, consistent with any instructions or directives in a final decision.

VIII. Conclusion

SolarCity support the ACR and encourages the Commission to move expeditiously to ensure that the IOUs recognize the legal rights of customer-generators with NEM-paired storage and to extend the exemption from interconnection and other charges provided by the statute.

Respectfully submitted at San Francisco, California on November 1, 2013,

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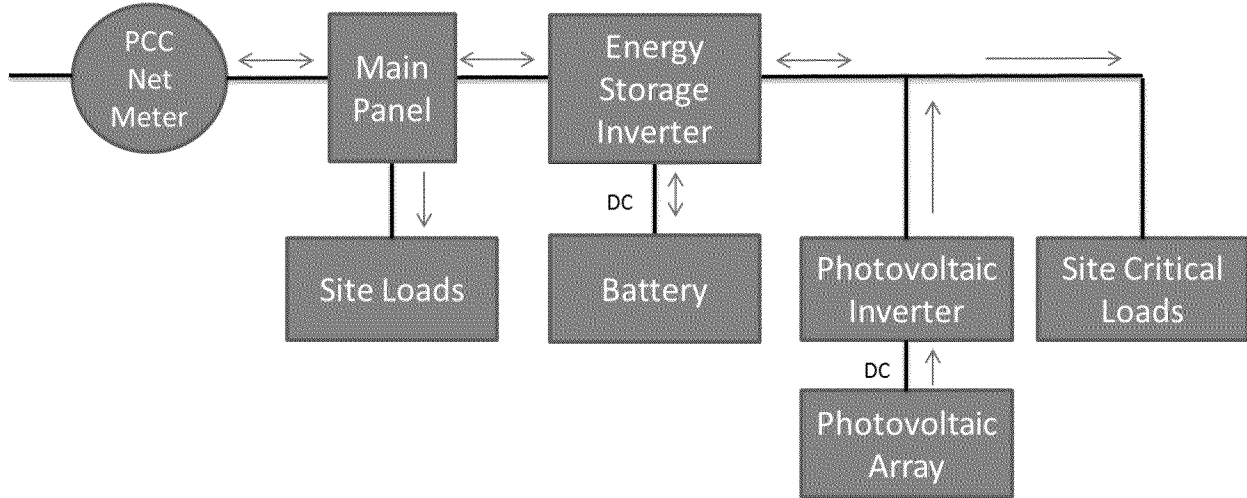
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ATTACHMENT A

Configuration: AC Coupled Storage and PV with Backup



Configuration: DC Coupled Storage and PV with Backup

