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OF THE STATE OF CALIFORNIA


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OPENING COMMENTS OF SUNRUN, INC. ON JOINT STAFF PROPOSAL

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Sunrun, Inc. ("Sunrun") submits these opening comments on the Joint Staff Proposal on Multi-Use Applications ("MUAs") for Energy Storage ("Proposal") pursuant to Judge Cooke’s May 18, 2017 ruling. Sunrun offers an advanced distributed energy resource ("DER") product called BrightBox that combines solar PV, advanced inverter technology and an energy storage system. Starting in Hawaii, and now in California, the company has sold over 1,000 of these advanced systems. BrightBox systems also have been awarded incentives from California’s Self-Generation Incentive Program and successfully bid into a demand response ("DR") request for offers ("RFO") in the State. Sunrun hopes to maximize the use and productivity of customer-sited systems, including by bidding the value stack from such systems into the California Independent System Operator ("CAISO") wholesale market and into RFOs for grid services from the State’s various retail electric providers.

Sunrun commends staff from both the Commission and CAISO ("Joint Agencies") for the Proposal’s thoughtful analysis of the complex issues that must be resolved to fully realize the valuable MUAs distributed energy storage resources provide. Sunrun agrees with much of the Proposal’s direction, especially the principles and rules ensuring energy storage resources can
take advantage of multiple value streams for the different grid services they provide. Equally important are principles ensuring compensation is based on incremental, unique, real and measurable services to avoid double compensation.

While Sunrun agrees with the principle of ensuring that resources important to reliability prioritize that reliability, the Proposal goes too far in mandating prioritization and disallowing storage resources from contracting or bidding for more than one MUA. A better approach is to build on the existing reliability framework the state has employed for the past decade-and-a-half, where tariffs and agreements require performance and provide financial incentives to ensure such performance. Penalties may be appropriate as part of this framework but only if such penalties exist for all resources providing that service. As discussed in more detail below, we recommend adding a guiding principle along these lines to ensure undue discrimination does not occur.

Moreover, the Commission should harness the potential of all types of behind-the-meter (“BTM”), solar-paired systems, including net energy metering (“NEM”) systems. Over 600,000 of the State’s most energy-aware residents have already installed such systems and many have existing relationships with third-party providers capable of aggregating solar-paired NEM systems. Market rules that ignore or prohibit these customers from offering incremental services would be an enormous missed opportunity for the State. A guiding principle prohibiting the creation of artificial barriers preventing BTM resources, including NEM resources, from participating in RFOs and in the CAISO market would go far towards ensuring such resources are not unjustly discriminated against.

I. Parity Must Exist Between Aggregated Solar + Storage DERs and Other Resources.

The current economics of distributed storage resources require access to the multiple
revenue streams these resource can provide, including the distribution and system-level functions the Proposal identifies in Appendix A. Proposed Rules 1 to 4 and 15 support these ends by establishing clear boundaries for domain-specific resources but then also ensuring such resources have access to the value stack the Joint Agencies envision. Sunrun agrees that “[a]chieving this vision increases the value of storage, and potentially other forms of energy resources, and enhances its economic viability and cost-effectiveness.” However, work remains to ensure all storage resources have non-discriminatory access to the appropriate revenue streams.

A. The Terms “Guiding Principles” and “Resources” Would Better Capture the Proposal’s Goals Than the Terms “Rules” and “Devices”.

Throughout the Proposal, the Joint Agencies refer to “rules” and a “storage device” rather than “guiding principles” and “storage resources.” While seemingly a minor issue, this mischaracterization seems to color much of the Proposal’s analysis. Many of the “rules” in the Proposal represent important principles that underlie the framework for procurement practices in a successful market for the reliable provision of electric service. However, the term “rules” seems premature when stakeholders are far from suggesting CAISO tariff language, for example, that effectuates the market principles by which the Joint Agencies seek to have market actors abide. The term “principles” better represents both the aim of the proposal, i.e., to set the boundaries for market activity, and the current status of discussions within the docket.

In a similar manner, the term “storage device” suggests a framework where the proposed rules would bind individual devices rather than the aggregated devices that would be combined to form what might more properly be called “resources.” As the Joint Agencies know, advanced

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1 Proposal at 26-28.
2 *Id.* at 3.
inverter and communication systems allow for a coordinated response from different DERs with varying points of interconnection in the system, as well as multiple devices behind a single utility meter that are most valuable when coordinated as a single resource. Indeed, aggregation of BTM devices can allow the aggregator to satisfy MUAs by responding to price signals even more economically and flexibly than a device constrained by a single point of interconnection. While different than a centralized generating unit with one point of interconnection, a DER aggregator would follow protocols necessary to ensure a geographically diverse set of devices can perform as one seamless resource. The White Paper recognizes this approach implicitly when it states “resource owners will likely develop storage projects in a capacity greater than is required to fulfill any one obligation, to maximize their ability to provide multiple services while minimizing exposure to penalties for non-performance or for some other reason.”

Regulating storage resources at the level of individual devices contravenes the treatment of other resources in the CAISO market, where rules only apply to the sum of those devices. The Tariff, for example, does not apply to the individual solar panels or wind turbines making up utility-scale solar and wind resources but rather to the aggregate of those devices identified in a participating generator agreement. CAISO’s DER aggregation framework already recognizes and builds upon this approach. Adopting the viewpoint that aggregated DER will operate as a unified resource assists in resolving some of the questions the Joint Agencies raise.

**B. Overly Prescriptive and Heavy-Handed Market Rules Constrict Market Access and Raise Concerns of Unjust Discrimination.**

Sunrun is concerned that the strict prioritization requirements, and other requirements preventing storage devices from contracting or bidding for multiple reliability-based MUAs, is

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3 *Id.* at 8.
overly prescriptive and heavy-handed. To the maximum extent practicable, the CPUC should rely on two elements that have formed the foundation of other reliability-based programs in the State: (1) availability requirements and (2) financial incentives via compensation and, as appropriate, penalties.

More specifically, availability requirements can be thought of as an obligation, whether based in the CAISO tariff or a bi-lateral contract between a resource and a utility distribution company (“UDC”), for the resource to “show up” in the form of bidding or providing capacity, energy or ancillary services. An example of this would be the must-offer obligation in the Resource Adequacy (“RA”) program, which requires RA resources to bid into the day-ahead and real time markets.4

Financial incentives can take the form of either compensation or penalties. Compensation means either payments for the performance of the service or products offered, or the absence of payment if the resources does not “show up,” or if it does “show up,” it deviates from its CAISO schedule or dispatch instruction in real time. Penalties for failing to either “show up” or follow dispatch signals may also be appropriate for certain reliability-based services but only, as discussed below, if such penalties exist for all resources providing that service.

The Proposal gets this right in a number of places, including when it states in the context of non-reliability services:

> [T]he Commission and the ISO agree with designing effective market price signals, financial incentives and possibly penalties associated with each use in a multi-use application in order to drive prioritization of those services, rather than establishing a strict

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4 Id. at 10.
priority of service to which the resource must be dedicated all of the time, regardless of whether the storage provider is utilizing the same or different capacity. Market price signals, financial incentives and penalties may include rates and tariffs applicable to a service, imbalance energy settlement in the wholesale market, as well as specific penalties for nonperformance.5

However, the Proposal errs in excluding reliability-based services from the same framework, instead suggesting “a strict priority of service to which the resource must be dedicated all of the time, regardless of whether the storage provider is utilizing the same or different capacity” would apply to reliability-based services. The Proposal’s suggested Rules 7-12 bring this idea to bear, requiring strict prioritization of reliability-based services and disallowing other MUAs the storage system may be able to provide. While Sunrun agrees these “rules” represent important principles, a heavy-handed approach that strictly prioritizes one MUA over another could stymie development.

For example, procurement for non-wires alternatives (“NWAs”), including storage resources, is relatively new and currently under development in the Integrated Distributed Energy Resources (“IDER”) proceeding. Setting rules at this stage for procuring storage-based NWAs may lead to unforeseen consequences, like limitations on innovation, by removing flexibility required in compensating and operating all DERs (including storage) for services to the grid. Such a prescriptive approach could also create limits for storage resources that would prevent participation in other programs, such as in RFOs for NWAs in the IDER, that other market participants, such as energy efficiency and DR providers, would not face.

Rather, market rules should promote a fair playing field for storage in technology-neutral RFOs and market products. “Storage operators should be allowed to resolve possible conflicts in

5  Id. at 8 (emphasis added).
the actual use of storage resources by pursuing the best prices,” and avoiding appropriate penalties, among the different markets for MUAs. That is, the market should set up requirements and financial incentives that enable a storage operator to choose and prioritize services over others based on an economic decision. Such an approach ensures resources perform as intended without setting unnecessary and artificial barriers based on priorities that limit the flexibility of a resource to maximize its ability to provide multiple MUAs. The Proposal appears to get this right in the context of RA when it states:

We expect that, in practice, an energy storage resource providing RA capacity will not use the same capacity to engage in other services or activities that may deplete its stored energy so as to render it unavailable to fulfill its MOO. Further, as with reliability services, we are cognizant of the reality that, if financial incentives are sufficiently strong, resource owners will likely develop storage projects in a capacity greater than is required to fulfill any one obligation, to minimize exposure to any penalties. There is no good reason to prevent a storage provider from increasing its service options and managing its risk in this manner as long as the provision of the full resource adequacy value is guaranteed.7

As California Energy Storage Alliance (“CESA”) noted at the June 2, 2017 Workshop, the Joint Agencies appear to have substantial concerns that BTM storage resources will not perform as required under their CAISO Tariff or contractual obligations. It seems this concern has caused the Joint Agencies to suggest creating penalties for storage resources where they might not exist for other resources providing the same service. Without appropriate justification for this discriminatory treatment, setting market rules to create such penalties could result in

6 Id. at 29 (summarizing Stem’s comments).
7 Id. at 10. The meaning of the word “guaranteed” at the end of this section is unclear in this context. Sunrun does not support this statement if “guaranteed” is intended to be the equivalent of an approach that prohibits contracting for one MUA in addition to another due to strict prioritization requirements.
undue discrimination against storage resources. Thus, we recommend adding a guiding principle that penalties should not be created for failure to provide a storage MUA unless other resources providing the same service are also subject to such penalties.

Moreover, rules established through Commission decisions can only be changed via other decisions modifying those previous decisions. Where rules might remove the flexibility that may be required for procurement of BTM storage resources, guiding principles provide direction to procurement without being a binding constraint. Thus, Sunrun recommends revising Rules 7-12 to be stated as guiding principles underlying the market rules that are eventually applied. Taking each in turn:

- **Rule 7 can be revised to a guiding principle stating:** Market rules should ensure a storage resource providing a reliability service will not be performing any activities that would prevent its performance of the reliability service when needed.

- **Rule 8 can be revised to a guiding principle stating:** Market rules should ensure that a storage resource prioritizes any reliability service it is providing before any non-reliability service.

- **Rule 9 can be revised to a guiding principle stating:** Market rules should ensure a storage resource does not contract for two or more different reliability services from the same capacity in a single, or multiple, domain during the same time interval.

- **Rule 10 can be revised to a guiding principle stating:** Market rules should ensure that a storage resource procured to avoid or defer a transmission or distribution asset upgrade will comply with the availability and performance requirements specified in its contract with the relevant authority.

- **Rule 11 can be revised to a guiding principle stating:** Market rules should ensure that storage resources respond to a direct operating instruction, or a control signal rather than a normal market dispatch, if such instructions or signals are necessary to provide the MUA.

- **Rule 12 can be revised to a guiding principle stating:** Market rules should ensure that a resource deferring a transmission upgrade retains available unloaded capacity that cannot be used for any other service in any domain in order to be able to respond to a
contingency event when needed. The precise requirements will typically depend on the location and the specific transmission upgrade being deferred.

Crafting “market rules”, *i.e.*, the availability obligations and clear financial incentives, based in either compensation or penalties, to follow these principles will result in storage operators “only signing contracts for services what would not result in conflicting dispatches.”

C. **NEM Solar-Paired Storage Systems Can Provide Incremental, Unique, Real and Measurable Services if the Right Rules are in Place.**

There are currently over 650,000 NEM systems in the State, many of which have the potential to be retrofitted with storage, and future NEM systems can be paired with storage if provided with the correct incentives to do so. Failing to ensure NEM systems can provide MUAs would be an enormous missed opportunity. NEM systems contribute to GHG reduction in CA, and storage helps manage when solar is fed to the grid to maximize its value and benefits. This capability to optimize the use of energy from a NEM system makes solar + storage entirely distinct from NEM-only or battery-only systems. To wit, CAISO has identified storage-based DERs as able to meet various operational challenges, including mitigating over-generation, shifting loads to reduce conventional resource needs, and decreasing peak demand to avoid the need for transmission upgrades.

Despite Southern California Edison’s urging, the Proposal correctly points out that “the CPUC has adopted no policy prohibiting NEM storage resources from participation in the wholesale energy market.” While CAISO rules *currently* prohibit “resources that are participating in retail programs, such as net metering with storage or virtual net metering,” from

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8. *Id.* at 29.
participating in “wholesale market aggregation,” the Commission should not foreclose the potential for incremental resources or services from existing NEM customers.

There is little reason to prevent NEM customers from participating in the wholesale market if the services provided are incremental to those services already being compensated. CAISO’s reasoning for preventing NEM from participating in its DER aggregation proposal is that NEM systems already receive “benefits from netting its excess energy against subsequent electricity bills; therefore, there is no energy available to offer into the CAISO markets because excess energy is banked for later withdrawal.” However, this reasoning ignores what might be called “service incrementality” that ensures there is “energy available to offer into the CAISO markets” from NEM customers.

One way to provide service incrementality for a NEM customer is adding a new BTM resource that provides additional value. A simple example would be adding an onsite BTM storage system that is not integrated with the components of the NEM system and, therefore, is able to provide separate and distinct services in the wholesale market.

However, this does not preclude the possibility that a BTM storage system that is integrated with a NEM system could also supply separate and distinct services. Another way to provide service incrementality would be to operate an existing NEM resource in a manner that provides additional value. An example of this kind of service incrementality would be to enable dispatch of aggregated, BTM, solar-paired storage NEM systems that currently are not dispatchable. Another example would be an aggregation of solar-paired storage NEM systems that commit to offer a prescribed amount of load reduction in a specific time interval. In non-

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12 Id.
dispatchable NEM systems, energy exports and load reductions depend on the timing of PV production, the remaining charge in the battery system, and the customer’s loads, meaning such exports and reductions might be predictable to an extent but are less than certain. Neither the function of dispatchability nor commitments for set load reductions during certain hours currently form part of the compensation structure for NEM customers and, therefore, would provide incremental value that is currently uncompensated.

Likewise, foregoing NEM bill credits to provide a grid service provides an incremental basis for compensation. For example, aggregated solar + storage NEM systems can provide regulation down services in response to dispatch signals to help solve over-generation. To do so, the inverter at each individual device would curtail the output of both the PV and storage system, thereby increasing load, eliminating any energy exports that may have been occurring, and assisting with resolution of the over-generation situation. Likewise, in an overvoltage situation, an advanced inverter’s Volt-Watt function has the potential to curtail the output of both the PV and storage system, thereby increasing load, eliminating any energy exports that may have been occurring, and assisting with the overvoltage issues. The curtailment required for both of these grid services foregoes the savings the NEM system would otherwise realize from onsite production, and, therefore, should be compensated.

While the possibility of “double-counting” for certain grid services provided by NEM systems should be addressed, this should neither be complicated nor a barrier to NEM systems providing different MUAs. If those services are “incremental, unique, real and measurable” beyond the service already being provided via NEM, then such incrementality should be
compensated. Failing to ensure NEM resources can take part in MUAs does not make sense, and one of the Proposal’s aims should be to determine rules governing the participation of NEM systems in providing different MUAs.

D. Artificial Barriers to Bidding Into RFOs Should Be Prohibited.

As CESA noted in its post-workshop comments, RFOs to date have effectively excluded many BTM storage resources from participation. Any time a utility solicitation forces a BTM/residential storage resource to bid into a Proxy Demand Response (“PDR”) program, for example, it all but prevents participation in the RFO. Storage should not be treated only as demand reduction at the distribution level for a distribution capacity RFO. Storage has the ability to inject power on the grid, providing multiple “stacked” services with the same aggregated resource. Mandating PDR participation for BTM resources ignores the other capabilities of a storage resource to provide additional services that are valuable to the grid and other customers.

Sunrun appreciates and supports the Joint Agencies’ agreement “in general with the principle of allowing all grid domains to compete, and recommend that all grid domains be eligible for all solicitations, unless the IOU justifies a need to prohibit procurement from a particular grid domain.” As an initial starting point, RUN believes the Joint Agencies should include an additional principle of requiring IOUs to refrain from creating barriers for BTM in storage procurement that would discriminate between BTM and other resources or otherwise impede using BTM for the multiple stacked services in the Proposal. The CAISO and IOUs

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13 Proposal at 30.
14 Id. at 22.
15 Id. at 20.
should be resource neutral if the rules and financial signals are applied consistently.

II. Responses to Specific Questions

Sunrun responds below to specific questions within the Proposal. While it does not answer each question posed, it reserves its right to address other parties’ responses to all questions in its reply comments.

1) Comment on the 5 service domains and 20 services identified. Is this list comprehensive? Should more services be added? Should any services be removed? Why or why not?

While the Proposal does a nice job of listing different MUAs storage resources can provide, the Joint Agencies should recognize the fluid nature of these issues by acknowledging that the number of services may need to change. For example, many of the services in the Proposal simply state that CAISO does not define certain services in its Tariff at this time.\textsuperscript{16}

In addition, the current classification of services does not fully embrace the characteristics of future services that are being discussed in other Commission proceedings. Storage, particularly customer-sited storage, can be instrumental in providing services like distribution peak capacity reduction, load shaping, and short-run ramping. Currently these services are being discussed in the DR proceeding as DR is evolving to include services into four core categories: Shape, Shift, Shed and Shimmy, as follows:\textsuperscript{17}

- **Shape** captures DR that reshapes customer load profiles through price response or on behavioral campaigns—“load-modifying DR”—with advance notice of months to days. **Shift** represents DR that encourages the movement of energy consumption from times of high demand to times of day when there is surplus of renewable generation.

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\textsuperscript{16} See, e.g., id. at 27 (definitions of “Transmission Deferral” and “Inertia”).

• **Shift** could smooth net load ramps associated with daily patterns of solar energy generation.

• **Shed** describes loads that can be curtailed to provide peak capacity and support the system in emergency or contingency events—at the statewide level, in local areas of high load, and on the distribution system, with a range in dispatch advance notice times.

• **Shimmy** involves using loads to dynamically adjust demand on the system to alleviate short-run ramps and disturbances at timescales ranging from seconds up to an hour.

While some of the incremental services may already be compensated by, for example, retail NEM compensation for BTM solar + storage resources, others, especially those requiring UDC or CAISO dispatch, may not.

5) Is it necessary to establish any rules with regard to “time” now? If so, what is the specific recommendation?

Resources that can provide different MUAs at different times should not be prohibited from providing multiple services, as long as the interval for the services do not overlap. The responsibility for ensuring overlap does not occur should fall to the storage operator, with sufficient financial incentives to ensure availability and performance.

6) As an example of a potential “time” concern, suppose the ISO instructs a storage device not to discharge due to excess supply on the grid, and at the same time the customer instructs the device to discharge to reduce the customer’s demand charge, and as a result the ISO must curtail some renewable generation on the grid. How can such situations best be prevented?

The hypothetical posed here raises issues that pertain to whether or not this customer should contract for, or bid to provide, regulation services when reducing his or her demand charge is clearly an important issue for the host customer. That question is best answered by both the individual customer and his or her DER service provider. For example, the customer
and third-party provider could determine, after examining their options, that paying a higher
demand charge, and agreeing to follow a dispatch signal to refrain from discharging the storage
unit to serve onsite load, is the economically superior choice. This question is one for the
customer to answer and not one the Joint Agencies should be answering for it. The focus should
be on adequate financial incentives to discourage the storage operator from committing the
resource to respond to instructions from the CAISO “not to discharge due to excess supply on the
grid” at the same time it would choose to “discharge to reduce the customer’s demand charge.”

8) It has been suggested that, for customer level services, compensation only be allowed
for those services for which procurement has not already occurred, meaning the load
serving entity planned for the activity to occur and avoided investment in generation
– short or long term – for that service. The purpose is to avoid stranded costs while
also preventing double compensation. At the same time it appears to conflict with the
ability of customers to manage their energy needs as they see fit. Should
incrementality rules consider procurement to try to avoid contributing to stranded
costs?

The customer-level services identified in the Proposal include “TOU Bill Management,”
“Demand Charge Management,” “Increased PV Self-Consumption,” and “Back-Up Power.”
Utilities do not procure for these services, customers do. The compensation for such services are
embedded within a private transaction between customers and DER installers and/or third-party
providers of DER services.

The end result of this customer “procurement” is typically a net reduction in load the
utility, or alternative retail electric provider, must serve. Such load reductions are reflected in
load forecasts, which impact need determinations and, ultimately, RFOs and resource
procurement. Thus, the only place a UDC or CAISO would see customer procurement for
customer-level resources is within reduced load forecasts.

The question of stranded costs and double compensation related to load reductions should
be outside of the scope of the Proposal and its related issues. The only question that needs to be answered here is whether an MUA is “incremental, unique, real and measurable” beyond the service already being provided.\textsuperscript{18}

III. Conclusion

Sunrun appreciates the opportunity to comment on the Joint Agencies’ thoughtful Proposal. We encourage the Commission to focus on market mechanisms, and not command-and-control regulation, to unlock the value stack for storage resources while maintaining, if not enhancing, the reliability the State demands. Such mechanisms allow the market to respond with economically efficient solutions without foreclosing the technological advancements the State wishes to encourage.

Respectfully submitted at Oakland, California,

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\textsuperscript{18} Proposal at 30.