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California Independent System Operator  
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**RE: Energy Storage and Distributed Energy Resources Phase 4 Issue Paper**

Electrify America, LLC (“Electrify America”) appreciates this opportunity to comment regarding the California Independent System Operator (“CAISO”) Energy Storage and Distributed Energy Resources (“ESDER”) Phase 4 Issue Paper (the “Paper”). Electrify America commends the CAISO on its continued efforts to lower barriers and enhance the abilities of these resources to participate in CAISO markets, and concurs with the CAISO that such resources will serve an important role in the future grid.

Electrify America is investing \$2 billion over the course of a decade - \$800 million of which will be in the State of California alone - in zero emission vehicle (“ZEV”) infrastructure, education and awareness, and access efforts to support the increased adoption of ZEV technology in the United States. In our first cycle of investment, we are building a national network of ultra-fast, DC fast chargers across 42 states, with over 600 such dispensers planned for deployment across California by the end of this year. Our state-of-the-art 350kW-capable dispensers will be at select locations nationwide. These systems can provide roughly 20 miles of range per minute, allowing for charging experience approaching gas station refueling speeds, and in doing so, can help spur the public’s adoption of electric vehicles. Beginning this summer, Electrify America will also offer ‘no-money-down’ residential Level 2 chargers and installation as part of its Cycle 2 California ZEV Investment Plan. The plan will allow drivers with a home charger to potentially earn financial rewards for plugging in and supporting a demand response platform.

High-powered EV charging dispensers are expensive to operate in areas where demand charges are extremely high. A single charging session can cause an EV charging company to absorb a significant demand charge for a high-power, customer-friendly charging experience. This problem is exacerbated when coincident high-powered charging occurs at multi-dispenser locations. To help mitigate such costs, Electrify America is planning to install energy storage systems at over 100 of its locations in 2019, totaling over 25 MW of anticipated behind-the-meter storage.

However, in addition to the behind-the-meter use of such storage, Electrify America believes that behind-the-meter storage can serve a larger role in wholesale markets via enhanced multiple-use application (“MUA”) provisions under ESDER Phase 4. Furthermore, additional demand response enhancements should be considered under ESDER Phase 4 to help realize the full potential for both commercial and residential DC fast charging and electric vehicle supply equipment (“EVSE”) load.

*Multiple-Use Applications (“MUA”)*

As stated in the Paper, Non-Generator Resources (“NGR”) in the CAISO market are 24x7 wholesale market resources irrespective of any dispatch instruction. For behind-the-meter NGR, such as electric



storage resources, this results in financial implications that can jeopardize the primary behind-the-meter application for which they were initially procured, resulting in many resources electing not to partake in CAISO markets via the NGR participation model. For example, the locational marginal price (“LMP”) when a behind-the-meter storage system discharges to mitigate retail demand charges may be lower than the LMP at which it charged during a lower retail electricity rate. This may result in a net payment to the CAISO despite the lack of a dispatch instruction or net injection to the distribution grid from behind the meter.

Electrify America encourages the CAISO to make MUA a priority during ESDER Phase 4. A mechanism to address MUA could allow full settlement of resource charging or discharging at the LMP at the NGR sub-meter only in market intervals where a dispatch instruction is received from the CAISO. Accordingly, 24/7 wholesale market settlement should be waived as long as no net export occurs from behind the retail meter in a given interval. This construct would not only preserve the ability for electric storage resources to serve behind-the-meter applications, but would also facilitate the ability for such resources to participate in CAISO markets when dispatched for all the capacity, energy, and ancillary services that the resource is technically capable of providing.

#### *Demand Response Enhancements - Commercial*

Electrify America plans to interconnect DC fast chargers approaching 100 MW of theoretical capacity in the CAISO market by the end of 2019. The typical vehicle driver expects a consistent experience for using public fast charging infrastructure and expects to be back on the road as quickly as possible, and such a customer-friendly experience is crucial to promoting ZEV adoption. However, for critical events, payment at the real-time market LMP can serve as a lucrative incentive for demand response (“DR”) of commercial charging assets with active customer opt-in to participate for the specific charging session based on their needs.

For the value of the active, real-time demand reduction to be recognized properly, both baseline methodologies to evaluate achieved load reduction and market dispatch timeframes should be addressed under ESDER Phase 4, given the highly variable use of DC fast charging infrastructure. Current baseline methodologies poorly reflect the actual load reduction due to a DR dispatch of a publicly available DC fast charging dispenser. While the CAISO allows for alternative or statistical baseline methodologies to be applied for DR resources, creating mechanisms that recognize the real-time load reduction achieved as a result of a dispatch instruction would facilitate the improved participation of such load in CAISO’s DR participation models. Analogously, current real-time market dispatch time-frames inhibit active, real-time customer participation in the DR market. Optional mechanisms should be created to allow load measurement and a bid to be submitted in one five-minute real-time market interval, and for a dispatch instruction to be immediately issued and load reduction measured in immediately subsequent five-minute market intervals.

While such minute-to-minute management of bids and dispatch instructions is uncommon in wholesale markets today, Electrify America believes enhancements to DR participation models are needed to realize the full potential of electric vehicle-grid integration (“VGI”) in the CAISO market as



electric vehicle penetration increases. Furthermore, additional opportunities exist for VGI via creation of a dispatchable consumption participation model during negative LMP, analogous to the proxy demand resource - load shift resource (“PDR-LSR”) participation model introduced for energy storage under ESDER Phase 3.

### *Demand Response Enhancements – Residential*

For residential charging, consumers expect a seamless experience where their vehicle is ready when they need it. Significant potential exists to leverage long-duration charging at the home to be beneficial to the grid, especially when vehicles are charging via a ‘smart’ EVSE that can actively manage rate structures and market participation opportunities subject to user needs.

As more and more vehicles are charged at home overnight, wholesale market demand response opportunities can present a valuable monetary stream to provide customers additional incentives to set preferences and revenue to support the ‘smart’ EVSE technology/software investment and maintenance.

However, multiple DR assets cannot currently participate independently in DR programs from behind the same retail meter/location. This limits demand response participation in CAISO markets, especially as the penetration of such DR-capable resources grows at a location and even if the capabilities of such newer DR assets exceed the ‘first’ such DR registration. While the option for a different performance measurement methodology for sub-metered EVSE from its host facility load was addressed under ESDER Phase 3, the ability for the sub-metered EVSE to participate independently in DR programs from behind the same retail / location meter should be addressed in ESDER Phase 4.

Electrify America requests that the CAISO allow for DR resource registration using the EVSE as a sub-meter without regards to if the retail meter is already registered as a resource. Such registration modifications should be compatible with the performance measurement methodologies from ESDER Phase 3 regarding sub-metered EVSE load. Further, the CAISO should permit EVSE-embedded sub-meters to qualify for both market registration and performance measurement purposes. This would help mitigate the potentially cost-prohibitive installation of a separate sub-meter and further facilitate the potential of VGI as electric vehicle penetration grows.

### *Conclusion*

Electrify America requests that the CAISO prioritize the following under ESDER Phase 4:

1. Multiple-Use Applications: Settlement of resource charging or discharging at the LMP at the NGR sub-meter only in market intervals where a dispatch instruction is received from the CAISO
2. Demand Response – Commercial: New baseline methodologies to evaluate achieved load reduction, minute-to-minute market dispatch timeframes, and a VGI load consumption participation model during negative LMP for DC fast chargers



3. Demand Response – Residential: Registration and participation of an EVSE-embedded sub-meter in DR programs independent from the retail meter

Electrify America thanks the CAISO again for this opportunity to comment regarding the ESDER Phase 4 Issue Paper, and would be happy to further discuss any of the requests raised in this letter.

Respectfully submitted,

/s/ Robert Barrosa

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