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Comments of Tesla, Inc re- 2025 Building Energy Efficiency Standards

Additional submitted attachment is included below.

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May 8, 2024

California Energy Commission
Docket Unit
Docket No. 24-BSTD-01
715 P Street
Sacramento, CA 95814

Chair Hochschild, Commissioners and CEC Staff:

Tesla thanks the California Energy Commission (CEC) for the opportunity to submit these comments regarding the CEC's proposed 2025 Building Energy Efficiency Standards. As a manufacturer and retailer of energy storage systems, Tesla has a keen interest in the inclusion of energy storage in the standards, recognizing the role that battery storage can play in effectively integrating and utilizing renewable resources like rooftop solar and reducing greenhouse gas emissions associated with the built environment.

We further appreciate the challenge the CEC faces when incorporating energy storage into the building standard, which is, in certain key respects unlike other more traditional energy efficiency measures that builders deploy to meet the building performance standards. Specifically, unlike more conventional energy efficiency solutions, which are inherently greenhouse gas reducing, the degree to which storage reduces emissions fundamentally depends on how end-use customers choose to operate the system. For example, if a storage system is operated such that it charges from low-emissions intensity energy and discharges to meet onsite loads that would otherwise be served by using energy with a higher emissions intensity (and accounting for roundtrip efficiency losses), its net impact is to reduce emissions relative to the status quo. However, by the same token, if the system is operated such that it charges during periods when the emissions intensity of the energy being stored is high and is then discharged to meet onsite loads during times when the marginal emissions rate of the energy that would otherwise be used is low, the storage system will result in increased emissions relative to the emissions that would have occurred in its absence. Similarly, if a storage system were to be operated such that its capacity were held entirely in reserve to provide backup power in the event of an outage (and not considering that in the absence of a storage system a customer might deploy a conventional backup generator) it would fail to decrease emissions relative to the status quo or what could be achieved if the system were cycling as described above, and/or would lead to a modest increase in emissions to the degree some amount of charging would be needed to maintain its state of charge. Given these profoundly different emission impacts depending on how systems are operated, the CEC has, not unreasonably, developed a set of operational requirements that storage systems need to abide by if they are to count toward meeting the CEC building standards. These operational requirements are reflected in Joint Appendix (JA) 12 of the regulations.

Over the past several months, Tesla has worked collaboratively with CEC staff as part of a coalition to amend JA12, particularly as it applies to storage deployed in the residential context in an effort to strike a reasonable balance between ensuring that customers are able to use storage systems to provide backup power, while also ensuring that those systems are cycling in a manner that achieves emissions reductions necessary to support the inclusion of storage in the building standard. Tesla supports the proposed changes to JA12 pursuant to which a customer designates a certain amount of a storage system's energy capacity that will count towards the building performance requirements ("cycling

capacity") and which is required to abide by the various "control strategies" established by JA12, with the important allowance that customers may, on a time-limited basis, hold this cycling capacity in reserve to support the provision of backup power in the face of a potential grid outage. Importantly, to ensure customers don't simply leave this capacity in reserve indefinitely, the proposed regulations would require this cycling capacity to revert to a JA12-compliant cycling mode after 72 hours. This is an important and helpful change to JA12 recognizing the critical role that storage plays in providing backup power in the face of customer energy security and reliability concerns.

However, despite this reasonable change to the JA12 requirements, Tesla believes that additional amendments are needed to ensure that these requirements don't unduly hamstring system operations in the face of real-world circumstances that will inevitably arise. As discussed above Tesla understands the CEC's motivation in establishing operational parameters governing how storage operates to the degree it is being deployed in lieu of other more conventional energy efficiency measures. However, the current language is overly restrictive. Several of the control strategies included in JA12 have very specific operational rules which if strictly obeyed will undermine the customer value proposition and/or require OEMs to develop bespoke functionality that only makes sense in the context of systems being deployed to meet JA12 requirements.

Both the Basic Control and Time-of-Use Control Strategies include a requirement that the storage system only charge from onsite solar. However, one could easily envision strict adherence to this being problematic in a number of scenarios. If a customer has just discharged their battery to serve onsite loads such that the state of charge is fairly low and they subsequently receive a public safety power shut-off notice, or other warning indicating that the outage risk is high, limiting charging to solar-only could very well mean that the system isn't able to get to a full state of charge before an outage actually occurs. In such a scenario, the customer's ability to ride through the outage may be compromised. Or, if a customer's solar simply system isn't producing enough energy, because of cloud cover, smoke or other factors beyond their control, to allow them to charge their storage fully in a reasonable timeframe, adherence to the solar-only charging requirement could mean that their battery system will not have sufficient energy to allow them to avoid drawing power from the grid during peak times thus leaving them exposed to significantly higher energy costs if they are on time-of-use rates. Preventing a customer from drawing from the grid in these circumstances is at cross purposes with the desired goal of reducing greenhouse gas emissions to the degree that had this customer been allowed to charge from the grid, they would have been economically motivated to do so at off-peak times, which typically aligns with lower marginal emissions rates relative to energy drawn from the grid during peak periods. Yet another scenario where the ability to charge from the grid would be beneficial not only to advance customer interests but also state policy goals involves programs like the Emergency Load Reduction Program and the Demand Side Grid Support Program, two virtual power plant programs developed by the California Public Utilities Commission and the CEC, respectively. If solar production is low and grid charging is not allowed, the ability to maximally leverage storage resources in response to emergency events will be reduced, possibly significantly. To address these and other potential contingencies, Tesla recommends softening the language to "prioritize" rather than mandating solar-only charging throughout JA12. Such a prioritization is more consistent with how residential battery systems, like the Tesla Powerwall, typically operate when paired with solar; relying on solar to charge the system to the greatest extent possible, but allowing for some grid charging to ensure the battery can provide the various services that customers demand when solar production is insufficient. Should the CEC choose not to modify the language as Tesla suggests, we encourage the CEC to explicitly enumerate the various circumstances when an exception to elements like solar-only charging is allowed. These circumstances should, at a minimum, encompass the scenarios discussed above.

Tesla further recommends modifying the language in JA12 to more clearly state that customers may switch between the different JA12-compliant control strategies provided the amount of cycling capacity remains unchanged. In the absence of amendments to allow this, the current language could be interpreted as requiring a battery system to be set and conform to one, and only one, control strategy over its useful life. We don't believe this is the intent as JA12 also includes language at JA12.3.3(c) which requires systems be capable of remotely switching between control strategies, but Tesla feels it would be helpful to more explicitly indicate/confirm that switching between control strategies is allowed. To the degree the CEC treats each JA12 control strategy as the same in terms of the credit value accorded for a given amount of cycling capacity, there does not appear to be a reason to limit customers' ability to switch between them.

In addition to these changes, Tesla also requests that the Advanced Demand Flexibility Control language be amended to recognize that OpenADR, the communication protocol that is required, by reference to section 110.12(a), to utilize this control strategy is not necessary to enable systems to effectively participate in demand response or other event-based programs. Proof positive of this is the fact that Tesla has enrolled and operated thousands of Powerwall systems in various event-based programs, including programs in California and does not currently use OpenADR to dispatch these systems. Dispatch of these systems has been achieved utilizing email and text messaging as the principle means by which program administrators, like the investor-owned utilities, notify Tesla of an event and allow us, as an aggregatgor, to then dispatch systems accordingly. While OpenADR is one means of communication to support event-based dispatch, it is not the only means and requiring it will create an unnecessary additional hurdle that will limit system eligibility.

Tesla offers redlines to the JA12 language consistent with these recommendations in the attachment appended to these comments.

Thank you for your consideration,

/s/ Andy Schwartz
Andy Schwartz
Senior Managing Policy Advisor
Tesla, Inc.

ATTACHMENT 1
Proposed Redlines to JA12

JA12.4.1 Basic Control

When combined with an on-site solar photovoltaic system, to qualify for the Basic Control, the BESS shall be installed in the default operation mode to prioritize ~~allow~~ charging ~~only~~ from an on-site photovoltaic system ~~when the photovoltaic system production is greater than the on-site electrical load~~. The BESS shall discharge to support onsite electrical loads only whenever the photovoltaic system production is less than the on-site electrical load.

JA12.4.2 Time-of-Use Control

When combined with an on-site solar photovoltaic system, to qualify for the TOU Control, the BESS shall be installed in the default operation mode to ~~allow~~ prioritize charging ~~only~~ from an on-site photovoltaic system ~~. The BESS shall begin~~ and discharging during the highest priced TOU hours of the day. ~~The operation schedule shall be preprogrammed from the factory, updated remotely, or programmed during the installation/commissioning of the system.~~ At a minimum, the system shall be capable of programming three separate seasonal TOU schedules, such as spring, summer, and winter.

JA12.4.3 Advanced Demand Flexibility Control

When combined with an on-site solar photovoltaic system, to qualify for the Advanced Demand Flexibility Control, the BESS shall be programmed by default as Basic Control as described in JA12.4.1 or TOU control as described in JA12.4.2. The BESS shall meet the demand flexibility control requirements specified in Section 110.12(a) or have the proven capability to provide the equivalent functionality through another means. Additionally, the BESS shall have the capability to change the charging and discharging periods in response to signals from the local utility or a third-party aggregator.

JA12.4.4 Controls for Separate Battery Energy Storage Systems

When installed separate from (not in combination with) an on-site solar photovoltaic system, including when the building is served by a community solar PV system, to qualify for the compliance credit, the BESS shall be programmed by default to:

1. ~~Start Charging from the grid at the onset of lowest priced TOU hours of the day and start discharging at the onset of highest priced TOU hours of the day~~Abide by the operational parameters of Time-of-Use Control as described in JA12.4.2, or

2. Meet the demand flexibility control requirements specified in Section 110.12(a), and shall have the capability to change the charging and discharging periods in response to signals from the local utility or a third-party aggregator.

JA12.4.5 Price Optimization Control

When combined with an on-site solar photovoltaic system, to qualify for the Price Optimization Control, the BESS shall ~~be controlled to~~prioritize providing maximum financial benefit. Additionally, the BESS shall discharge daily the full compliance cycling capacity unless the compliance cycling capacity has been reduced due to increased reserve amounts as envisioned by and compliant with JA12.3.3(d). The BESS shall meet the demand flexibility control requirements specified in Section 110.12(a) and have the capability to change the charging and discharging periods in response to signals from the local utility or a third-party aggregator.

JA12.4.6 Alternative Control Approved by the Executive Director

The Executive Director may approve applications for alternative control strategies that demonstrate equal or greater benefits to one of the JA12 control strategies. To qualify for Alternative Control, the BESS shall be operated in a manner that increases self-utilization of the PV array output, responds to utility rates, responds to demand response signals, minimizes greenhouse gas emissions from buildings, and/or other strategies that achieve equal or greater benefits than specified in Sections JA12.4.1, JA12.4.2, JA124.3, or JA12.4.4, JA12.4.5. The application to the Executive Director for the alternative control option shall be accompanied with clear and easy to implement algorithms for incorporation into the compliance software for compliance credit calculations.

JA12.4.7 Customer Ability to Switch Between Control Strategies

End-use customers may switch between Control Strategies as long as the amount of compliance cycling capacity remains unchanged.