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Tesla Response to Battery System FDAS RFI (25-FDAS-01)

Additional submitted attachment is included below.

3500 Deer Creek Road, Palo Alto CA 94304
P 650 681 5100 F 650 681 5101

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Docket Unit
California Energy Commission
715 P Street
Sacramento CA 95814

Subject: Docket 25-FDAS-01 – Tesla, Inc.'s Response to Request for Information Regarding Flexible Demand in California for Battery Energy Storage Systems

To Whom is May Concern:

Tesla appreciates the opportunity to submit this brief response to the Flexible Demand Appliance Standard (FDAS) Request for Information (RFI), which seeks to inform the development of a standard that would apply to battery storage, with a focus on residential scale battery systems. The RFI and the CEC's interest in this initiative is pursuant to Senate Bill 49, which specifically directed the CEC to establish standards to "enable appliance operations to be scheduled, shifted, or curtailed, to reduce emissions of greenhouse gases associated with electricity generation." As noted in the RFI, to date the CEC has adopted FDAS for pool pumps but has announced interest in establishing similar standards for a number of other products, including batteries, electric storage water heaters, low voltage thermostats, and electric vehicle service equipment. In the material below, Tesla explains why we do not feel that the development of an FDAS for residential battery storage systems is necessary given the flexibility that the vast majority of these systems already provide and recognizing the centrality to the value proposition of battery storage that this flexibility represents. Tesla sees significantly more downside risk than upside in the establishment of such a standard.

As a company whose mission is to accelerate the world's transition to sustainable energy, and that is actively pursuing that mission through the manufacture and deployment of various technologies that are key to decarbonizing those sectors of the economy that are among the largest contributors to greenhouse gas emissions (specifically transportation and energy), Tesla is philosophically aligned with the notion that devices that rely on electricity to provide end services to customers should be designed such that customers have a means of easily aligning usage with those times where the emissions associated with that usage can be minimized or mitigated. This makes sense from a broad societal standpoint, but also, given the availability of time-of-use rate designs and other programs that provide financial benefits to customers that can more dynamically manage how they use electricity in a manner that aligns with the state's emissions mitigation goals, is in the direct interests of the customers as well.

Pool pumps provide a good example of an appliance where the promulgation of a standard makes some intuitive sense. The provision of the actual service is not particularly time dependent (i.e., pool owners don't care when a pool pump operates, they just want to ensure that the water is clean and properly treated when the pool is being used) and so, to the extent pool pumps can be programmed to operate at

times when the marginal emissions rate of the energy being used is low, there is no or minimal reduction in the level of service being provided, but there may be substantial reductions in the greenhouse gas emissions attributable to the provision of the service. One can think of other appliances where a similar dynamic exists – electric hot water heaters would be another example where presumably customers don't care when the water is heated provided it's hot when they need access to hot water. To the degree that existing pool pumps and similarly situated appliances generally lack an ability to schedule when they operate in a manner that is correlated with times of low marginal emissions rates, there is a reasonable rationale for the CEC to take action to establish standards to either require these capabilities to be part of the product's feature set or establish labeling requirements that allow customers to easily distinguish which solutions offer those capabilities and which do not.

While there is more of a clear justification for standards-setting in the instances described above, the rationale seems less clear in the case of residential battery storage systems – Tesla is not aware of, nor has the CEC presented information to suggest that residential battery systems currently lack the ability to be programmed or operated in a manner that is aligned with the goal of reducing greenhouse gas emissions. The goals of SB 49, to enable appliance operations to be scheduled, shifted, or curtailed, is virtually inherent to residential battery systems – their primary value, beyond the provision of clean backup power, is to enable customers to reduce their exposure to peak time-of-use rates (which are generally correlated with those periods where the marginal emission rate from grid-sourced energy is high) by charging during times the cost of energy is low, whether from the grid during off peak times (when the marginal emissions rate from grid sourced energy is low) or from onsite renewable generation, and discharging that energy to meet onsite needs during times when the cost of drawing power from the grid is high, e.g., during peak times, or allowing customers to rely more directly on and get more value from an onsite renewable generating system, like onsite solar. In the case of the Tesla Powerwall, the primary operational modes offered by the system are the following:

- Self-Powered Mode: Maximizes solar use by storing excess solar power for nighttime use, reducing reliance on the grid and lowering the customer's carbon footprint.
- Time-Based Control: Minimizes customer bills by cycling the system to reduce exposure to peak energy rates for customers that are on time-of-use rates. Though the intent of this mode is bill minimization, because TOU rates generally align with marginal emissions rates, this mode functions in a way that also serves to reduce GHG emissions.
- Back-Up Reserve: This feature allows a customer to set the system to maintain a minimum state of charge to ensure that some minimum amount of energy is available to provide backup power in the event the grid goes down unexpectedly.
- Storm Watch: When activated, this mode will prioritize charging the battery to as high a state of charge as possible in anticipation of the grid going down. This mode only activates during times when outage risk is particularly high, typically due to inclement weather and associated red-flag warnings issued by the National Weather Service.

In addition to these features, customers with Powerwalls can enroll in virtual power plant programs where such programs are offered. In the specific case of California, tens of thousands of Powerwall systems have been enrolled in the Demand Side Grid Support Program and the Emergency Load

Reduction Programs, which compensate customers based on how their battery systems respond to dispatch events called by grid operators. Both programs give grid operators the ability to access extensive amounts of clean incremental capacity during those periods when bulk system resources are running low and thus represent an important insurance policy to stave off resource shortages and the need to ration power via brownouts or rolling blackouts. Active efforts are also underway at the CAISO and the CPUC evaluating whether and how to provide a path to market for behind-the-meter battery storage systems to participate in the state's capacity markets and programs as a supply side resource.

While not all battery systems offer all of these features, the vast majority of battery storage offerings aimed at the residential market do provide functionality that is consistent with the self-powered, time-based control and back-up reserve modes described above. Consistent with the focus of SB 49, they are specifically designed to enable customers to shift when they draw power from the grid (to charge) and to schedule discharge in a manner that reduces greenhouse gas emissions either in response to rate design and/or the availability of onsite generation. While back-up reserve is distinct from the other standard modes in that it is not responsive to rates or the availability of onsite renewable generation per se, it too represents a greenhouse gas reducing feature by allowing customers to rely on a battery system rather than a conventional, fossil-fuel powered generator for backup power.

Given all of the above, Tesla is struggling to understand the value of dedicating substantial Commission and stakeholder resources in developing a flexible demand standard for residential battery systems when these solutions already offer a feature set that is consistent with the requirements of SB 49 and what we presume any standard the RFI seeks to inform would require. Indeed, it is hard to conceive of a compelling value proposition for residential battery storage systems that don't provide the functionality discussed above. Tesla is also concerned that to the degree the core functionalities that a CEC-established FDAS would address are already being provided by these systems, such a standard would likely result in more harm than good by imposing overly prescriptive requirements dictating not only what specific features need to be offered, but how those specific features are operationalized. This level of prescription is ill-advised as it will, by definition, limit opportunities to innovate by dictating not just what is offered but how, rather than letting market participants develop compelling solutions based on opportunities they see in the marketplace.

The questions posed in the RFI delve into highly technical issues that encompass system software, communications and design architecture, all considerations that Tesla submits go well beyond the intended scope of SB 49 and encroach on issues that the market can and, frankly, already has, addressed by developing battery systems that exist largely if not entirely to provide the kind of demand flexibility that SB 49 seeks to facilitate in appliances more broadly. Furthermore, we also observe that some of the same topics implicated by the questions posed in the RFI, and which, by virtue of their inclusion suggest could be in scope for a future CEC standard, are also being addressed in other venues, including at the CPUC in various dockets including the Interconnection Proceeding, the High Distributed Energy Resource Proceeding and the Demand Response Proceeding, heightening the risk that any FDAS adopted by the CEC for battery storage systems could conflict with efforts being pursued at its sister agency.

The bottom line from Tesla's perspective with respect to FDAS is the following: the issue to be solved with regard to residential battery systems, and behind-the-meter battery systems more generally, is not whether the systems commercially available today are failing to offer sufficient flexibility (a problem that a product standard promulgated by the CEC could theoretically solve) but whether the incentives that customers and vendors face, whether via rate design or through programs on offer, are fully taking advantage of the flexibility these systems, by and large, already provide.

For these reasons, Tesla respectfully submits that there is no pressing public policy gap that development and enforcement of an FDAS for residential battery storage systems would address. Prior to developing such a standard, and notwithstanding what responses the CEC receives to the RFI, it is incumbent on the CEC to more clearly articulate what problem such a standard would resolve and determine whether the scope of that problem more than offsets the potential downsides.

Regards,

/s/ Andy Schwartz
Andy Schwartz
Senior Managing Policy Advisor
Tesla, Inc.
anschwartz@tesla.com