February 7, 2018

East Bay Community Energy
Supervisor Scott Haggerty, Chair, and EBCE Board of Directors
Nick Chaset, CEO
Via Email Submission to LDBPcomments@ebce.org
1111 Broadway, 3rd Floor
Oakland, CA 94607

RE: Tesla Comments on Local Development Business Plan

Dear Chair Haggerty and members of the EBCE Board of Directors, and Mr. Chaset:

Tesla appreciates the opportunity to comment on draft chapters of the proposed Local Development Business Plan (LDBP) for East Bay Community Energy (EBCE). Taken as a whole, these draft chapters represent a coherent and thoughtful vision for a better and cleaner electricity system for Alameda County.

EBCE seeks to achieve this vision while making energy more affordable to its customers by leveraging emerging distributed energy technologies that can provide multiple sources of value to host customers, wholesale energy markets and local transmission and distributions systems. Tesla applauds and supports this vision. Below please find our comments on the net energy metering, energy storage procurement and demand response chapters.

I. Net Energy Metering Strategy Recommendations

Tesla strongly supports the strategy recommendations for net energy metering (NEM). The recommendations appropriately begin with an analysis of the solar resource and how that resource can meet EBCE's particular energy needs. As shown in Figure 3, EBCE's service territory demonstrates a different net load curve than the CAISO system curve often referred to as the "duck curve." On days when energy consumption is the highest, peak load begins around noon and reaches its maximum around 4 – 5 pm, closely matching the hours of peak solar output. Relying on customer-sited and financed energy systems to meet this peak is an ideal way for EBCE to serve the energy needs of its customers without the need to encumber long-term liabilities in the form of energy contracts with suppliers that may be located outside of EBCE's service area.

In addition to offering net metering, EBCE also proposes to offer a half-cent baseline credit on all exported energy. Given that EBCE's demand peaks during solar production hours, this adder is a sensible means to encourage solar production and load reduction during the hours when energy is most valuable. Further, the additional half-cent export credit for projects using skilled local labor and the community benefit credit are creative ways to provide social equity to disadvantaged parts of EBCE's territory and help develop a skilled local workforce. The ability to provide these local economic development benefits demonstrates one of the key advantages of the Community Choice Aggregation model.

Our primary recommendations for modifications to the net metering chapter concern the supply-shift adder, and specifically proposed use of the adder to incentivize energy storage. As currently structured,

EBCE proposes to pay the $0.005/kWh adder on exports from NEM generators paired with storage systems that agree to allow EBCE to control charge/discharge of 20% of the storage capacity as needed. While Tesla supports creative programs that allow utilities to access valuable capacity in behind-the-meter (BTM) storage devices, we believe there are several problems with paying for this capacity via an adder on exported energy.

First, reserving capacity on a customer's battery system or other energy storage system conveys value to the utility – and imposes a cost on the customer – even if that capacity is never dispatched. If EBCE customers agree to reserve 20% of battery capacity for EBCE's dispatch, that capacity reduces the amount of generation capacity EBCE needs to buy in order to meet Resource Adequacy (RA) requirements. Likewise, keeping that capacity in reserve means the customer cannot use it to mitigate TOU rates or serve other purposes. Because the benefit (and cost) exists regardless of whether or not the battery is dispatched, it makes more sense for EBCE to pay for that capacity through a fixed capacity payment (or fixed monthly bill credit) that recognizes the value of having a portion of the battery capacity kept in reserve.

Second, the economics of battery operation in conjunction with solar PV systems on NEM 2.0 – along with CPUC rules limiting dispatch of BTM batteries to the grid – might frustrate customers' attempts to capitalize on the half-cent export credit. Because customers with NEM 2.0 systems are required to take service on time-of-use (TOU) rates, which increasingly peak in the evening hours, customers with batteries would likely use those batteries to store daytime solar energy for use in the evenings, reducing the amount of energy sent to the grid, which would cause them to forgo the adder for export.[1]

Compounding this problem is the fact that rules established by the state energy agencies currently do not provide demand response (DR) credit or compensation to energy exported to the grid from BTM batteries, as we discuss in the following section. Thus, customers who install BTM batteries in conjunction with NEM 2.0 systems would likely face an incentive to store energy from their PV system, causing them to forego the export credit, and they would also be prohibited from exporting energy from their battery in response to a DR signal. EBCE could rectify this issue by compensating customers for capacity reserved on BTM batteries through a fixed monthly bill credit or other mechanism, rather than an adder on export credits.

II. Demand Response Assessment

Tesla is encouraged by EBCE's assessment of the potential for demand response to meet capacity needs in a cost-effective manner. Like customer-sited generation, demand response is a means to meet EBCE's local energy needs using clean technology located in EBCE's service area without using fossil generation or encumbering the utility with long-term liabilities. While demand response has long been an under-utilized resource in California, a key advantage of the CCA model is the ability to move quickly and develop innovative new programs to solve problems like the ones that have stymied DR at the state level.

Two emerging demand response approaches we feel have particularly high potential are responsive electric vehicle (EV) charging and dispatchable BTM storage devices, as identified in figures 4 and 5 in EBCE's Demand Response Assessment. On responsive EV charging, Tesla encourages EBCE to explore approaches similar to those adopted by Marin Clean Energy and Sonoma Clean Power, which use price signals to encourage charging at times when energy is clean and inexpensive. While those programs both

[1] Assumes EBCE TOU rate periods match those established by the CPUC in A. 15-04-012

rely on external EV chargers, Tesla encourages EBCE to develop smart charging programs that operate using the vehicle's on-board telematics as a means to reduce the cost of program implementation.

On BTM energy storage, Tesla observes that this resource will increasingly serve as a compelling source of local, highly flexible capacity that is cost-effective for utilities compared with natural gas generation or other alternative sources of capacity. In addition storage devices can remove customer effort from the demand response equation, which is likely to reduce customer attrition and recruitment costs. BTM storage devices can be a low-cost source of capacity for a utility like EBCE because batteries are capable of providing a number of value streams that can be "stacked," which reduces the cost of capacity to the utility.

Utilities in other parts of the United States and around the world already are developing programs that rely on BTM batteries to meet their capacity needs while also providing customer benefits. For example, Green Mountain Power provides a program where customers pay the utility a small monthly fee to use the battery for backup power, and the utility is able to dispatch the batteries to meet peak load needs.[2] In South Australia, the government recently announced a program in partnership with Tesla to deploy aggregated solar and storage resources on customer premises to serve as a "virtual power plant" that supplies the utility with clean, flexible generation.[3]

In California, one of the most significant barriers to accessing the full value of BTM battery capacity is the fact that energy exported to the grid is not currently recognized or compensated in demand response capacity programs. For example, participants in the Demand Response Auction Mechanism (DRAM) are limited to using their batteries for load reduction and are not credited for energy or capacity during times when the battery is exporting to the grid.[4] The restriction on exports makes it difficult for BTM batteries to participate, since an aggregator can control a battery's state of charge but typically does not have control over whether or not the customer has positive load to drop when a DR event is called. As an innovative forward-looking utility with a mandate to serve its population with local clean energy, we encourage EBCE to explore ways to address this problem in order to devise programs that make full use of the capacity of batteries deployed behind customer meters.

III. Energy Storage Contracting Strategy

Tesla appreciates the difficulty facing EBCE in meeting the requirement to comply with its mandate under AB 2514 to procure roughly 14 MW of energy storage by 2020. The fact that EBCE will not have an established credit rating with which to conduct procurement during the compliance window presents a special challenge, and we commend EBCE for proposing creative solutions that will enable it to meet the requirement. In particular, the financing and credit worthiness recommendations make sense as feasible measures to mitigate the credit challenge.

In addition, Tesla strongly supports EBCE's proposal to provide storage systems at no cost to residential CARE customers for the purpose of mitigating TOU rates on behalf of those customers. Beyond

[2] "GMP Launches New Comprehensive Energy Home Solution from Tesla to Lower Costs for Customers," Green Mountain Power press release, May 12, 2017. https://www.greenmountainpower.com/press/gmp-launches-new-comprehensive-energy-home-solution-tesla-lower-costs-customers/

[3] "Tesla is helping South Australia build what will be the world's largest virtual power plant," by Thuy Ong, *The Verge*. https://www.theverge.com/2018/2/5/16973270/tesla-south-australia-worlds-largest-virtual-power-plant

[4] This prohibition stems from the fact that participation in DRAM requires enrollment in CAISO's Proxy Demand Resource (PDR) or Tariff, which does not provide demand response credit for exported energy.

contributing to EBCE's storage procurement mandate, this proposal can offer critical rate relief for low-income customers while also helping EBCE meet its peak load requirements. Tesla's primary recommendation regarding the residential CARE proposal is to expand the storage system size in order to serve larger households, improve program costs on a $/kWh basis, and provide additional dispatchable capacity that can be used to meet RA requirements.

In its CARE proposal, EBCE targets a system size of 2.2 kWh at a cost of $2,000, not including installation. While such small systems may be appropriate for customers in relatively small homes or apartments, a 2.2 kWh system might not provide a significant bill reduction for customers in larger homes with higher energy use. Even with a relatively high peak/off-peak differential of $0.20, a 2.2 kWh storage system would provide an estimated benefit of approximately $0.40/day.

In addition, at around $1,000/kWh, the cost of these systems per kWh is quite high relative to larger systems with more capacity. For example, the Tesla Powerwall 2 has 13.5 kWh of capacity at a price of $6,200 with supporting hardware (not including installation) – which comes out to $460/kWh, or less than half of EBCE's proposed residential storage solution on a per-kWh basis before installation. Thus, Tesla recommends that larger storage systems be eligible for a portion of the residential storage program. Not only would this allow EBCE to offer greater energy savings to larger households at a lower cost per kWh, but the higher capacity could also provide EBCE the opportunity to reserve a portion of the battery's capacity to meet RA needs – thereby driving both customer and utility benefits from a single device.

Furthermore, Tesla supports the recommendations to use TOU rate pilots to promote energy storage deployment. Many TOU rates offered by California utilities feature peak/off-peak rate differentials that currently are not steep enough to promote energy storage deployment. Where steep differentials exist, those differentials sometimes exist only in the summer. As a means to deploy storage and incent its beneficial operation, EBCE should consider offering pilot TOU rates that are designed to provide a reasonable energy arbitrage opportunity to energy storage system owners.

Finally, Tesla commends EBCE for its vision to implement a "virtual power plants" aggregation model as a long-run objective. With renewable energy becoming increasingly ubiquitous in the years ahead as the state approaches the 50% RPS target, the need for dispatchable capacity will become increasing concentrated in a few hours in early evening. Energy storage devices are ideally situation to meet this need, and locating them on customer premises can allow the devices to provide additional values, including reliability and resiliency, when they are not being dispatched by the utility. Tesla looks forward to working with EBCE to make this vision a reality.

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We appreciate the opportunity to comment on draft chapters of EBCE's proposed Local Development Business Plan.

Sincerely,

Damon Franz,
Senior Policy Advisor