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Tesla Comments - 45 Day Language Draft Express Terms

Additional submitted attachment is included below.



February 20, 2018

Commissioner Andrew McAllister and Energy Commission Staff
California Energy Commission
Dockets Office
Re: Docket No. 17-BSTD-02
1516 Ninth Street
Sacramento, CA 95814

RE: 45-Day Language Express Terms for the Title 24 2019 Building Energy Efficiency Standards

Dear Commissioner McAllister and Energy Commission Staff:

I am writing on behalf of Tesla to share our comments regarding the proposed 45-day language express terms for the 2019 building standards.

Tesla previously submitted several sets of comments that explain our proposal for how best to incorporate a credit mechanism for solar photovoltaics (PV) plus energy storage within the Energy Design Rating (EDR) score and provide technical feedback on the capabilities of behind-the-meter storage systems in response to the requirements outlined in Joint Appendix (JA) 12.¹ We appreciate Energy Commission staff incorporating a significant portion of our feedback in the proposed 45-day language.

We focus these comments primarily on outstanding technical issues for JA 11 (solar PV) and JA 12 (storage) that will help strengthen the 45 day language once addressed. Additionally, we recommend minor modifications to the mandatory requirements in Subchapter 2 under the demand response (DR) controls and the proposed compliance pathways in Subchapter 8 specific to the EDR components.

Joint Appendix JA11 – Qualification Requirement for Photovoltaic System

We suggest additional refinements to JA11 in regards to the minimal shading criterion and solar access verification.² These refinements are based on Tesla's technical experience as a solar power provider and consistent with industry standards.

JA 11.3.1 Minimal Shading Criterion

The current wording of the minimal shading criterion JA11.3.1 appears to recommend that no shading is allowed versus establishing a minimal shading requirement. Under a minimal shading requirement, there should be a maximum allowance of some shading as this is often standard in PV system designs.

¹ Tesla comments submitted on May 5, 2017, September 6, 2017, and October 20, 2017. Available at: http://docketpublic.energy.ca.gov/PublicDocuments/17-BSTD-01/TN217464_20170505T163804_Francesca_Wahl_Comments_Tesla_Comments_2019_ZNE_Residential_St.pdf; http://docketpublic.energy.ca.gov/PublicDocuments/17-BSTD-01/TN221070_20170906T165047_Francesca_Wahl_Comments_Tesla_Comments_Aug_22_2017_Staff_Works.pdf; http://docketpublic.energy.ca.gov/PublicDocuments/17-BSTD-01/TN221565_20171020T132724_Francesca_Wahl_Comments_Tesla_Comments_Oct_45_Workshop_Prerule.pdf

² This is based on the version of JA11 that was posted on the CEC on January 18, 2018. Available at: http://docketpublic.energy.ca.gov/PublicDocuments/17-BSTD-02/TN222215_20180118T153331_45day_Express_Terms_2019_Standards_JA_11.pdf

Furthermore, advanced module or inverter technologies available today can help mitigate the impact derived from minimal shading. Section JA11.3.2, PV Array Geometries Performance Input, notes that if the minimal shading criterion above is not met, the geometries of the PV array should be described in the performance method. In order to evaluate the performance method as a viable, alternate compliance option, more detail will need to be provided in the Compliance Manual.

JA11.4 Solar Access Verification

Upon further review of the solar access verification requirement, it appears that this may be unnecessary given that the design process for a new community already accounts for shading. Additionally, there may be some redundancy in requiring compliance with both JA 11.3.1 and JA 11.4 as the usefulness of the data provided in JA 11.4 is unclear, especially if the minimal shading levels outlined in JA 11.3.1 are met. Finally, it is unclear from the current language if Home Energy Rating System (HERS) verification is required, which may further negate the need for JA 11.4.

Joint Appendix JA12- Qualification Requirement for Storage System

Tesla appreciates the refinements to the requirements in JA 12 for storage that are reflected in the proposed 45 day language.³ In order to ensure the storage requirements meet technical capabilities of battery storage systems, we suggest several additional modifications to the current language regarding the control requirements under JA12.2.3. Generally, Tesla continues to believe that requirement JA12.2.3 c) is unnecessary as it could impact the customer experience. Concerns about battery operation that could negatively impact grid interaction are already addressed by utility interconnection agreements and through economic price signals sent to the customer.

JA12.2.3.1 Basic Control

We suggest the following modification to the current language under the basic control requirements:

- “ battery storage system shall be installed in the default operation mode to allow charging only from an on -site or community photovoltaic system ~~when the photovoltaic system production is greater than the on-site electrical load.~~ The battery storage system **operates such that it shall discharge** when the photovoltaic system production is less than the on-site electrical load.”

As currently written, basic control appears to simply be saying that the battery must charge from PV and discharge to the home without exporting. There may be some cases where it makes sense to charge the battery before serving onsite load that are separate from Time-of -Use (TOU) control. The modified wording suggested above would help clarify this qualifies for basic control.

JA12.2.3.2 TOU Control

The current language does not define “peak” when referring to TOU hours. Without a standard definition for peak hours, some peak period may not be captured. For example, certain California utility TOU rates for weekends only have an off peak and mid peak period. During these times it would make most sense to discharge during the mid-peak, which under the current definition of this section, is not technically the “peak” period. Staff should either develop a definition for “peak” to include the peak hours defined in any

³ This is based on the version of JA12 that was posted on the CEC website on January 18, 2018. Available at: http://docketpublic.energy.ca.gov/PublicDocuments/17-BSTD-02/TN222222_20180118T154131_45day_Express_Terms_2019_Standards_JA_12.pdf

given day or alter the proposed language to state that “begin discharging to the dwelling and/or the grid only during the **non off** peak TOU hours.”

JA12.2.3.3 Advanced Demand Response Control

While this section focuses specifically on DR, enabling the flexibility to incorporate additional control strategies under an advanced control strategy is important. Currently, the control strategies do not capture potential future strategies such as dynamic real time price signals and variations of demand charges. Therefore, it could be beneficial to broaden the title of this section to address “Advanced Control” rather than solely focusing on DR. Alternatively, a fourth control strategy could be added similar to our recommendation in previous comments to include a “Flexible Control” strategy.

Subchapter 2 – Demand Management Requirement

Section 110.12 describes the mandatory requirement for demand management systems.⁴ It states that:

- All demand responsive controls shall ~~be capable of functioning as~~ an OpenADR 2.0a or OpenADR 2.0b Virtual End Node (VEN), as specified under Clause 11, Conformance, in the applicable OpenADR 2.0 Specification.

As currently written, this section appears to establish a requirement to utilize OpenADR 2.0 for all demand responsive controls under any demand management technology including battery storage systems. We recognize that the OpenADR program is intended to facilitate DR and lower costs and complexity overall but mandating communication protocols may have the opposite effect. Innovation in the device and DR space may identify a superior solution, at which point this requirement would only increase the cost of DR-participating devices. At this time, the industry is not adequately mature to know which is the appropriate protocol to establish as the standard so it would be premature to tie these requirements to OpenADR. For example, the California Public Utilities Commission has adopted a competing standard for distributed energy resources (DER) – Smart Energy Profile (SEP) 2.0 – for their monitoring and control requirements.⁵

At minimum, if the OpenADR 2.0 requirement discussed above is adopted, a cloud solution must be adequate to allow flexibility in communications standard implementation. We, therefore, recommend the following addition to Section 110.12 a):

- Be capable of communicating with an OpenADR 2.0b Virtual End Node (VENs), as specified by Clause 11 of the OpenADR 2.0b specification.

⁴ Comments are based on the version of Subchapter 2 that was posted on the CEC website on January 18, 2018. Available at: http://docketpublic.energy.ca.gov/PublicDocuments/17-BSTD-02/TN222173_20180118T132758_45day_Express_Terms_2019_Standards_Ch_2.pdf

⁵ IEEE 2030.5 (SEP 2.0) is the default protocol required for DERs under Rule 21. D.16-06-052, p.4. Available at: <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M164/K376/164376491.pdf>; <https://sunspec.org/ieee-2030-5-common-california-iou-rule-21-implementation-guide-smart-inverters/>

Subchapter 8 - Energy Design Rating

Section 150.1 in subchapter 8 pertains to the performance and prescriptive compliance approaches for low rise residential buildings.⁶As described in this section, the current EDR language attributes value to demand flexibility measures such as battery storage, yet it is still unclear from the language provided to what extent battery storage will receive credit toward the efficiency equation of the EDR.⁷It is important that batteries be allowed to receive credit toward meeting a portion of the efficiency EDR through the performance compliance approach, as Tesla and other stakeholders such as the California Building Industries Association, the Solar Energy Industries Association, and the California Solar and Storage Association have advocated for.⁸ It will be critical that the Residential Compliance Manual process outlines the opportunity to utilize a grid harmonization credit for battery storage for both the efficiency and demand flexibility components of the EDR. We look forward to working with staff and stakeholders on this process.

* * *

Tesla appreciates the opportunity to submit comments on the 45-day language express terms for the 2019 standards. The technical requirements proposed for battery storage and solar PV play a critical role in ensuring the 2019 code is as effective as possible in moving California toward the zero net energy (ZNE) goal for new homes. With the modifications suggested in these comments, we are confident the 2019 code will be able to capture the full value that solar PV paired with storage can provide to meet grid harmonization needs.

We look forward to continuing to work in partnership with the Energy Commission to achieve the state's clean energy and greenhouse gas emissions goals.

Sincerely,

Francesca Wahl
Sr. Policy Associate, Business Development and Policy

⁶ Comments are based on the version of Subchapter 8 that was posted on the CEC website on January 24, 2018. Available at: http://docketpublic.energy.ca.gov/PublicDocuments/17-BSTD-02/TN222354_20180124T131523_45day_Express_Terms_2019_Standards_Ch_8.pdf

⁷ The same language is also reflected in definition of the Total Energy Design Rating and Demand Flexibility Measure in Section 100.1 under Subchapter 1.

⁸ http://docketpublic.energy.ca.gov/PublicDocuments/17-BSTD-01/TN217466_20170505T170153_Evelyn_Butler_Comments_Comments_regarding_2019_Building_Energy.pdf; http://docketpublic.energy.ca.gov/PublicDocuments/17-BSTD-01/TN217469_20170508T093603_California_Building_Industry_Association_CBIA_Comments_2019_ZNE.pdf