



**Pacific Gas and
Electric Company**[®]



A Sempra Energy utility[®]



A Sempra Energy utility



SOUTHERN CALIFORNIA
EDISON[®]

An EDISON INTERNATIONAL[®] Company

November 16, 2015

Verena Radulovic
Climate Protection Partnerships Division
US Environmental Protection Agency
Washington DC 20460

Subject: ENERGY STAR Draft 2 Electric Vehicle Service Equipment Test Method

Dear Ms. Radulovic:

The enclosed letter contains comments on the Draft 2 test method for the upcoming ENERGY STAR Electric Vehicle Service Equipment (EVSE) Specification v1.0, submitted on behalf of the California Investor Owned Utilities (California IOUs). The California IOUs represent some of the largest utility companies in the western United States, serving a combined customer base of over 35 million people. The California IOUs include Pacific Gas and Electric Company (PG&E), Southern California Gas Company (SCGC), San Diego Gas and Electric (SDG&E), and Southern California Edison (SCE).

As progressive energy companies with an extensive portfolio of efficiency programs, the California IOUs understand the potential for efficiency specifications and standards to cut costs and save energy while maintaining or increasing consumer satisfaction. The California IOUs have a responsibility to their customers to advocate for sensible test procedures, specifications, and standards that accurately reflect the climate and conditions of their respective service areas, so as to maximize the positive effects.

The California IOUs believe that an ENERGY STAR EVSE specification can facilitate these energy efficiency and demand response efforts by utility companies. We encourage efforts by the United States Environmental Protection Agency (US EPA) to continue developing an ENERGY STAR EVSE test method and specification and are providing the following comments to support US EPA's efforts.

1. US EPA should define vehicle states and clarify references to J1772

The current definitions should be revised for several reasons.

First, the Electric Vehicle Service Equipment (EVSE) operating mode definitions in Draft 2 (section 3(C)) refer to vehicle states "A", "B", "C". However, these terms are not defined. In addition, Draft 2 states that the operating modes may or may not align with the Society of

Automotive Engineering (SAE) International standard J1772¹ definitions of state “A”, “B”, “C”, etc. Therefore, we recommend that US EPA clearly define all terms in the Definition section.

In addition, we recommend that US EPA review opportunities to harmonize with the definitions in the SAE International standard J2894/2 titled “Power Quality Test Procedures for Plug-In Electric Vehicle Chargers.” J2894/2 is specifically intended to address EVSE operating states and may provide a more useful model for the operating mode definitions.

We have summarized in Table 1 a number of undefined terms that we assume originate from J1772. We recommend including explicit definitions for these terms in the revised test method.

Table 1. Undefined Terms

Undefined Term	Test Method Section(s)
State “A”, “B”, “C”	3.C.3, 7.4, 7.5
Mode “s1”, “s2”	7.4, 7.5
Current measurement location “L1”, “L2/n”	5 (C)
“duty cycle”	7.4(D)(3)

2. US EPA should clarify the overlapping EVSE mode definitions

The proposed definitions of Partial On Mode and Idle Mode (section 3(C)) appear to overlap. Idle Mode is defined as “Condition during which the equipment can promptly provide a primary function, but is not doing so.” Partial On Mode is defined as “Condition during which the equipment provides at least one secondary function”, which includes a Wake-up function. We recommend that US EPA clarify whether the ability to promptly provide a primary function is the same as a Wake-up function.

In addition, the definitions of secondary and tertiary function appear to overlap. For instance, the definition of secondary function includes indicator lights while the definition of tertiary function includes status indicator. The definition of secondary function also includes ambient lighting, while the definition of tertiary function includes area lighting.

We recommend that US EPA eliminate these overlaps. We also recommend considering consolidating the list of functions with the operating mode definitions that rely on these lists of functions for further clarity.

3. US EPA should develop Demand Response and Price Response criteria.

We support the development of Demand Response and Price Response criteria (section 7.7), including interoperability and communications based on open source protocols. This topic is very important to utilities due to Plug in Electric Vehicle (PEV) charging loads that can exceed a residential house load.

¹ SAE Electric Vehicle and Plug in Hybrid Electric Vehicle Conductive Charge Coupler, last updated January 2010.

Therefore, we agree with US EPA’s statement that the upcoming test methods should promote open standards and open access. The California IOUs recommend that US EPA encourage certification of connected devices to an open standard (such as OpenADR 2.0a certified products). The criteria should also state that, at a minimum, connected EVSE must be capable of using open standards for bi-directional communication between the entity that sends the Demand Response (DR) signal and the EVSE to qualify for ENERGY STAR labeling as a connected device. This requirement is not intended to restrict manufacturers from also including proprietary communications technologies or protocols, as long as the system can also communicate using open standards. We would be pleased to work with US EPA to determine how to align definitions and standards with utility experience and programs. Examples of more detailed specifications can be seen in California Title 24 Joint Appendix 5 and the related International Green Construction Code standard.

In addition, we infer that US EPA intends to develop criteria to differentiate units with these capabilities rather than mandating that every ENERGY STAR EVSE include these capabilities.² We request that US EPA clarify this point.

4. US EPA should defer the development of metering criteria.

We understand that US EPA is considering whether to include metering capacity in the ENERGY STAR v1.0 test method (section 7.7) and upcoming specification. We are not aware of information in the US EPA scoping memo or webinar presentation that would support a test method or specification at this time. We note that several California IOU pilots are specifically designed to pilot sub-metering of electricity via EVSE and other potential pilots may contain this element.³ Thus, additional information may be available in the future to support consideration of criteria for metering and US EPA may wish to list this as a topic for potential future consideration after v1.0 is issued.

5. US EPA should revise the Test Setup and Test Conduct sections to ensure representative conditions.

Adjustable screen brightness test settings

We recommend that US EPA revise the draft test method to require testing at 65% (or more) of maximum screen luminance for products with adjustable brightness settings (section 6.1(C)). We also recommend that the test method require measurement of the luminance maximum, minimum, and test values to ensure that this approach results in representative test conditions.

Daytime illuminance level

We agree with US EPA that testing automatic brightness controls (ABC) under conditions representative of both daytime and nighttime is desirable. We recommend reconsidering the 300 lux daytime illuminance setting (Section 6.1(C)(3)). Units designed for use inside an enclosed

²Line 569 of the EVSE Draft 2 test method states that “EPA anticipates proposing criteria for EVSE that ship with connected functionality that ensures both consumers and utilities will benefit from this added feature.”

³ Information regarding California IOU pilots specifically for submetering is available at <http://www.cpuc.ca.gov/PUC/energy/altvehicles/Plug-In+Electric+Vehicle+Submetering.htm>.

parking structure will typically experience significantly lower levels of ambient lighting as noted in “Lighting for Parking Facilities.”⁴ We also note that units rated for outdoor use will experience much higher daytime brightness levels than 300 lux. We are not aware of a current test method to represent outdoor daytime brightness levels and recommend that US EPA consider development of an outdoor daytime testing procedure for consideration in future versions of the test method.

Automatic power down

We agree that the test method should include a procedure for determining the time needed for automatic power down and appreciate that US EPA has added a procedure (section 7.2) in response to our prior comment letter on the Draft 1 test method. Draft 2 includes a use case where the EVSE is connected to a PEV but not charging. We agree that this is one representative use case. We also recommend that US EPA add a use case in the auto power down test to address when an EVSE is not connected to a vehicle, since the response may differ from the use case where the EVSE is connected to a vehicle but not charging the vehicle battery.

Energy use during network activity

The proposed test method for Partial On Mode and Idle Mode Testing (Section 7.4) does not address the presence or absence of network activity. US EPA should develop a standard protocol that addresses two way communications for testing networked EVSE. We also recommend that US EPA collect data to determine variability in energy consumption between the maximum data transfer rates, authentication, and routine maintenance activities as well as energy consumption without network activity.

EVSE input and output charging cords

We recommend revising the Draft test setup (section 5(F)) to require that EVSE are tested with the cord from the EVSE to the vehicle that is sold with the EVSE unit. If multiple options are available, the manufacturer should test with the cord with highest losses calculated based on the 2014 National Electrical Code (NEC) Chapter 9 Table 9.

We also recommend setting a benchmark in the test method for minimum length of the charge cord to the vehicle. ENERGY STAR should not allow the manufacturer to benefit from the reduced energy losses from charging cords that have unrealistically short lengths, because short cords could lead to consumer dissatisfaction. The tables and formulas in NEC 2014 Chapter 9, Table 9 can be used to calculate energy savings from a cord length below a minimum benchmark as part of the test method, and the allowable energy use in the specification could be reduced downward by the amount.⁵

Similarly, we recommend that the test method require testing EVSE with an input power supply cord of a minimum benchmark length, or adjusting the EVSE test result upwards based on an

⁴ Lighting for Parking Facilities. 2014. Illuminating Engineering Society. Table 2.

⁵ Data collected by US EPA can help inform decisions regarding the potential benchmark for minimum cord length. We note that 15 foot EVSE cords can typically reach all areas of a typical PEV passenger vehicle where a charging port may be located, if the EVSE is in close proximity to the vehicle.

equivalent level of energy consumption.⁶

6. US EPA should revise the Data Assembly Form consistent with these comments.

We understand that US EPA will use the Data Assembly Form posted on your website to collect information from manufacturers and inform your development of the upcoming specification. We recommend a number of revisions so that the Data Assembly Form will be consistent with the recommendations in this letter:

- Clarify the operating modes under which testing occurs;
- Add a data field for the wire gauge of the EVSE cord to the vehicle;
- List the length and gauge of the cord supplying power to the EVSE, if supplied with the EVSE;
- List the illumination conditions under which energy use data was collected;
- List minimum and maximum brightness levels for units with ABC;
- Add data fields under DR capabilities such as ability to operate using open standards;
- List energy use for various types of network activity.

We appreciate US EPA's response to our prior comments on the ENERGY STAR Draft 1 test method and this opportunity to provide comments on the Draft 2. We encourage US EPA to carefully consider these comments.

Sincerely,



Patrick Eilert
Manager, Codes and Standards
Pacific Gas and Electric Company



Sue Kristjansson
Codes and Standards and ZNE Manager
Southern California Gas Company



Steven M. Long, P.E.
Manager, Energy Codes & Standards
DSM Engineering
Southern California Edison



Chip Fox
Codes and Standards and ZNE Planning Manager
San Diego Gas and Electric Company

⁶ We recognize that inlet power supply cords are typically much shorter than the cord from the EVSE to the vehicle and thus will typically have significantly less impact on energy usage.