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Verena Radulovic
Climate Protection Partnerships Division
U.S. Environmental Protection Agency
Washington DC 20460

March 30, 2016

Subject: ENERGY STAR[®] EVSE Draft 1 Specification and Draft 3 Test Method

Dear Ms. Radulovic:

The enclosed letter contains the California Investor Owned Utilities' (California IOUs) comments on the Draft 1 v1.0 Specification and Draft 3 v1.0 Test Method for the upcoming ENERGY STAR Electric Vehicle Service Equipment (EVSE) program. 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, we understand the potential for efficiency specifications and standards to cut costs and save energy while maintaining or increasing consumer satisfaction. We have a responsibility to our customers to advocate for sensible test procedures, specifications, and standards that accurately reflect the climate and conditions of our respective service areas, so as to maximize the positive effects of these efforts.

We 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 (U.S. EPA) to continue developing an ENERGY STAR EVSE test method and specification and are providing the following comments to support U.S. EPA's efforts. We appreciate the efforts that U.S. EPA has made to date in response to our prior comments, and we look forward to continuing our constructive dialogue with U.S. EPA.

Comments on Draft 1 Specification

1) We recommend that U.S. EPA include energy reduction criteria for Automatic Power Down (APD) and consider faster APD requirements.

We agree with U.S. EPA's proposal to require APD for EVSE (section 3.2 of the draft specification) and have the following recommendations:

- We recommend that U.S. EPA add APD requirements that apply when an EVSE is not connected to a vehicle.

- We recommend defining how energy is reduced during APD, such as significantly dimming screens or powering them off, opening relay contacts, and/or other conditions.
- We recommend requiring a faster transition to APD than the current proposal of allowing default settings of thirty minutes to two hours. For instance, the U.S. EPA’s Draft 1 Specification for connected thermostats requires a transition to network standby within five minutes.¹ We expect that EVSE should similarly be capable of a fast transition to a reduced power mode.

2) We recommend that U.S. EPA reconsider the optional Demand Response (DR) criteria.

While we agree with U.S. EPA’s desire to encourage demand response capabilities in EVSE, we believe that U.S. EPA’s current proposed specification for an optional DR rating is premature for several reasons as stated below. Instead, we recommend that U.S. EPA list development of specifications for an optional DR rating under “Consideration for Future Revisions” in section 6 of the draft specification.

For instance, the draft specification would allow manufacturers to provide a narrative description of a unit’s DR capabilities and does not require that EVSE have the capability to provide any specific type(s) of DR responses. U.S. EPA has proposed requiring a narrative description as part of a base ENERGY STAR specification for connected thermostats rather than as part of an optional DR specification. We believe that a similar approach would be appropriate for EVSE.

In addition, we note that that U.S. EPA intends to develop an open communications standard (section 3.5 of the draft specification) for DR enabled EVSE. The standard could be met via a cloud-based service provider or the EVSE unit itself. While we are strong supporters of open communication standards, the cloud-based option may not be a good fit for EVSE. Unlike connected thermostats, which by definition include a service and device, EVSE are often sold as a stand-alone unit without a service package or dedicated service provider. We believe that this is an additional reason to remove the optional DR criteria to allow time for further development and market evolution.

We also note that DR standards would need to address both the EVSE and the vehicle to ensure customer satisfaction and vehicle battery management, potentially increasing complexity.

Looking to the future, California electric IOUs are in the process of developing requirements for EVSE DR functionality, and we will share any information that would help U.S. EPA consider a future DR specification.

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<https://www.energystar.gov/sites/default/files/ENERGY%20STAR%20Program%20Requirements%20for%20Connected%20Thermostats%20Version%201.0%20Draft%202.pdf>

3) We recommend that U.S. EPA clarify the definitions of vehicle-EVSE interface states.

We appreciate U.S. EPA's agreement with our November 16, 2015, recommendation to eliminate overlap between the definitions of "secondary" and "tertiary" function, as noted in the "ENERGY STAR EVSE Draft 2 Test Method Stakeholder Comment Summary and Response".² Please include this revision in section 1 of the draft specification.

We also understand that U.S. EPA intends that the term "wake up" function, which is used to define "Partial On Mode", should have a different meaning than the term "promptly providing a primary function" used to define "Idle Mode."³ We recommend clarifying the definition for each term in the draft specification since they currently appear to overlap.

The EVSE operating mode definitions (section 1) refer to vehicle states "A", "B", "C", and "D". However, these terms are not explicitly defined and the draft specification states that the operating modes may or may not align with the Society of Automotive Engineering (SAE) International standard J1772 definitions of state "A", "B", "C", etc.⁴ In addition, the definitions refer to states that are not included in J1772 currently and may be added in the future ("B1" and "B2"). Therefore, we recommend that U.S. EPA replace implicit references in the draft specification and test method to J1772 with explicit explanations of the EVSE operating states or direct cross-references to the current version of J1772.

In addition, we suggest that U.S. EPA consider harmonizing the operating mode definitions with the SAE International standard J2894/2 titled "Power Quality Test Procedures for Plug-In Electric Vehicle Chargers."⁵ J2894/2 is intended to address EVSE operating states and provides a useful model for the operating mode definitions.

4) We recommend that U.S. EPA recalculate the "Idle Mode" relay power allowance.

We understand that U.S. EPA added this allowance based on the expected power draw needed to close relay contacts and create a pathway for power flow from the EVSE to an electric vehicle (section 3.4 of the draft specification). We also understand that U.S. EPA originally calculated an allowance for relay power based on nine data points that aggregate all Level 1 and Level 2 products as well as one 100 ampere product that falls outside the scope of this proposed specification. These aggregated data points appeared to indicate that relay power would increase as a linear function of the unit's rated capacity. However, when we examined disaggregate data for Level 1 EVSE and then Level 2 EVSE we did not find any clear trend. These charts are shown in Appendix A. We also note that limited data is available, with four data points for Level 1 EVSE and four data points for Level 2 EVSE. Therefore, we encourage U.S. EPA to obtain additional data and recalculate the relay power

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<https://www.energystar.gov/sites/default/files/ENERGY%20STAR%20EVSE%20Draft%202%20Test%20Method%20Comment%20Matrix.pdf>

³ "Wake up" function is one of the "secondary functions" used to define "Partial On Mode" and the term "can promptly provide a primary function" is used to define "Partial On Mode."

⁴ SAE Electric Vehicle and Plug in Hybrid Electric Vehicle Conductive Charge Coupler, last updated January 2010.

⁵ http://standards.sae.org/j2894/2_201503/

allowance.

Comments on Draft 3 v1.0 Test Method

5) We support U.S. EPA’s proposed revisions to Automatic Brightness Control (ABC) ambient lighting conditions.

We agree with U.S. EPA’s decision to revise the draft test method to include a ten lux test to represent indoor parking facilities as recommended in our November 16, 2015, comments (section 4.1(C)(3) of the draft test method).⁶ Representative test conditions will help accurately capture ABC energy savings potential during testing.

We also appreciate U.S. EPA’s request for comments regarding the 300 lux illuminance setting intended to represent outdoor daytime conditions. We recommend that U.S. EPA consider use of a higher-output lamp to represent outdoor daylight conditions. We also recommend that U.S. EPA consider whether more substantial test method revisions would be warranted in the future to achieve even higher ambient lighting levels more representative of daytime outdoor conditions.

In addition, we recommend stating how ABC test runs will be used to determine compliance with the specification. For instance, the test method could require averaging the outdoor daytime and “dark” test results for equipment rated for outdoor use.

6) We recommend that U.S. EPA adopt standards for adjustable screen brightness test settings.

We recommend requiring a measurement of the maximum and test luminance values during testing of products with screens that include adjustable brightness levels without ABC (section 4 of the draft test method). This requirement is similar to ENERGY STAR Program Requirements Product Specification for Displays Version 7.0 (section 3.7).⁷ The test method could require testing at the maximum and minimum settings for the most common “Idle Mode” (connected, but not charging) EVSE screen display followed by the most common “Partial On Mode” (not connected to a vehicle) screen display.

We also suggest that U.S. EPA reconsider adding a requirement that screens are tested at 65 percent (or more) of maximum screen luminance for products with adjustable brightness settings similar to the ENERGY STAR Program Requirement Product Specification for Display section 6.3. Products may have easily accessible settings to verify this percentage, and alternatively the luminance testing described earlier should be sufficient to provide this information. The brightness setting of products in the field could be substantially different than the “as shipped” settings currently proposed in section 4.1(A), especially if they are professionally installed.

⁶ U.S. EPA may also wish to consider 12 lux consistent with the section 4(J) of the ENERGY STAR® Program Requirements Product Specification for Display s Eligibility Criteria Version 7.0 Rev. Nov-2015.

⁷ https://www.energystar.gov/products/spec/displays_specification_version_7_0_pd

7) We recommend that U.S. EPA clarify how APD test runs will be compared against the specification.

We appreciate that U.S. EPA has revised the Draft 3 v1.0 Test Method to require testing of APD capability during different EVSE operating states (section 5.2) as recommended in our November 16, 2015, comments. We recommend stating which of the three APD test runs will be used to determine APD capability during “Idle Mode,” and which will be used to determine APD capability for “Partial On Mode.” If more than one test run will be used to determine compliance with a Mode, the test method should state whether each test run or just the average of the test runs must meet the draft specification APD criteria (section 3.2) for that Mode.

8) We recommend that U.S. EPA collect additional data on energy use during network activity.

The Draft 3 v1.0 Test Method allows the manufacturer to test the product with only one communication channel activated (section 5.6). We recommend requiring activation of all communications channels for which the manufacturer is claiming an energy allowance under the Draft 3 Specification sections 3.3 and 3.4. We also recommend requiring that the settings used to verify “Full Network Connectivity” for “Partial On Mode” are retained during “Idle Mode.”

Furthermore, we suggest collecting information on the frequency of network data transfer events that could affect energy usage, such as user authentication. While the current Draft Test Method does not require data transfer, U.S. EPA could reconsider a requirement for data transfer in the future.

In conclusion, we would like to reiterate our support to U.S. EPA for establishing test procedures and standards for EVSE and we encourage U.S. EPA to carefully consider our comments.

Sincerely,



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Attachment A – Relay Power Graphs

Figures 1, 2, and 3 below illustrate our comment regarding the relay power allowance in the draft specification. Figure 1 contains all products including the 100 amp outlier as shown in U.S. EPA’s spreadsheet, Figure 2 contains Level 1 EVSE, and Figure 3 contains Level 2 EVSE.

Figure 1 – Energy consumption (vertical axis) vs rated power (horizontal axis) for all reported EVSE

Source: U.S. EPA

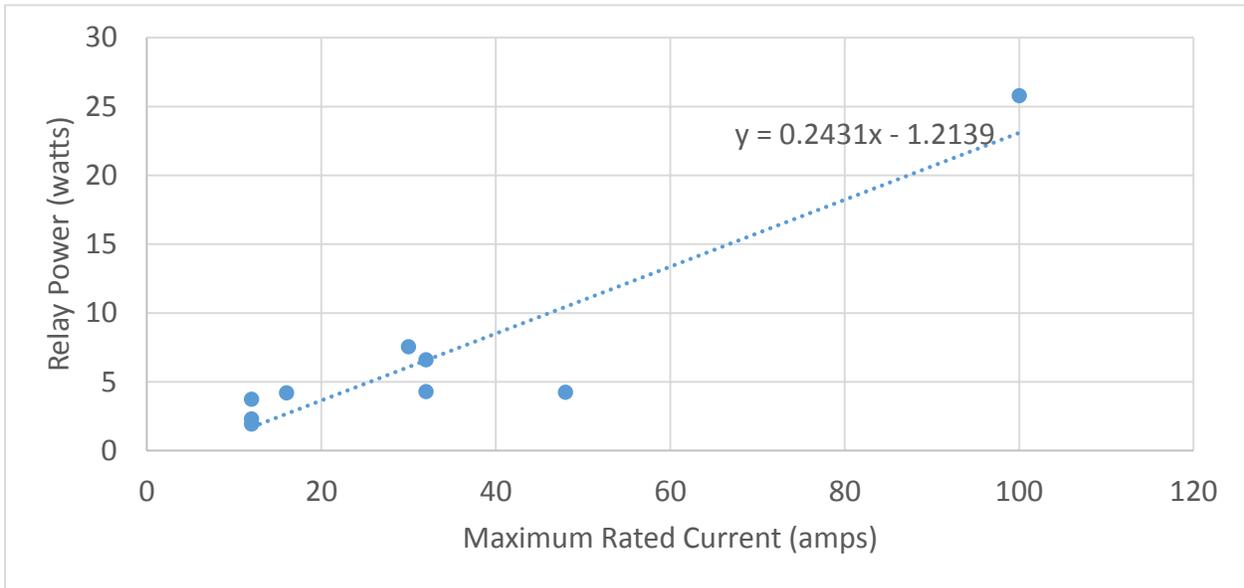


Figure 2 – Energy consumption (vertical axis) vs rated power (horizontal axis) for Level 1 EVSE

Source: California IOUs’ graph using U.S. EPA data

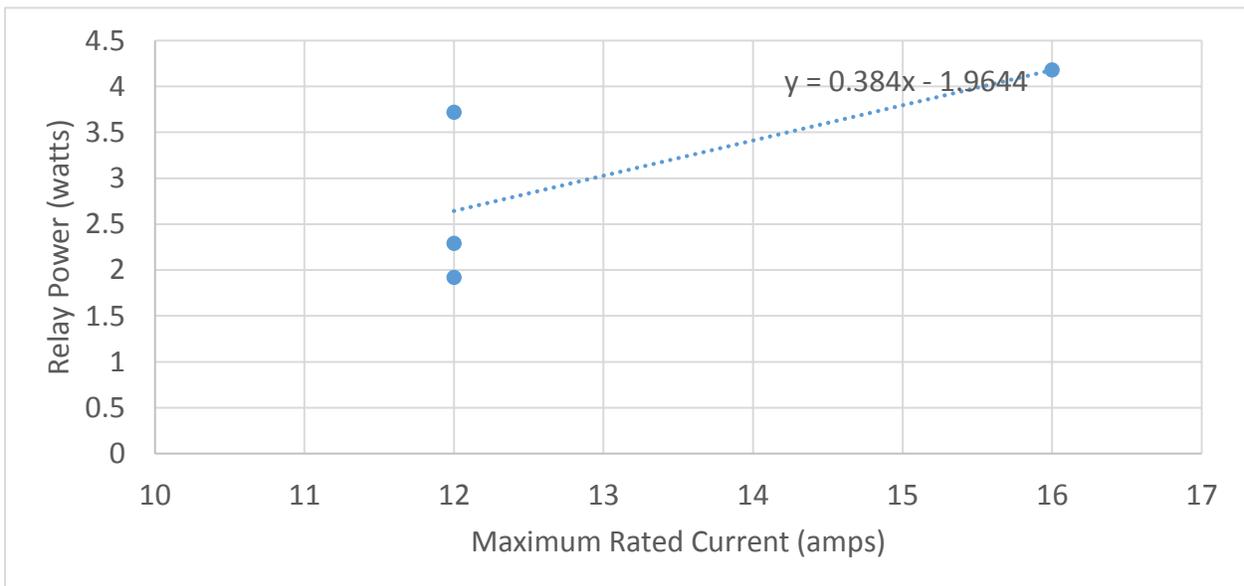


Figure 3 – Energy consumption (vertical axis) vs rated power (horizontal axis) for Level 2 EVSE
Source: California IOUs' graph using U.S. EPA data

