



Edison Electric  
INSTITUTE

Customer Solutions

Mr. James Kwon  
EPA Product Manager  
US Environmental Protection Agency  
Office of Air and Radiation  
Washington, DC 20460

**Re: EEI Comments to EPA on the Energy Star EVSE Version 1.1 Specification and Test Method for DC EVSE's**

Sent via e-mail to [EVSE@energystar.gov](mailto:EVSE@energystar.gov) and [Kwon.James@epa.gov](mailto:Kwon.James@epa.gov)

Dear Mr. Kwon,

The Edison Electric Institute (EEI) appreciates the opportunity to comment on the U.S. Environmental Protection Agency's (EPA or Agency) Version 1.1 Specification for Direct Current Electric Vehicle Supply Equipment (DC EVSE) and the June 4, 2018, webinar slides addressing the specifications and test method. EEI is the association that represents all U.S. investor-owned electric companies. Our members provide electricity for about 220 million Americans, and operate in all 50 states and the District of Columbia. As a whole, the electric power industry supports more than 7 million jobs in communities across the United States.

Driven by customer demands, technology developments, and federal and state regulatory obligations, the electric sector is undergoing a transition of its generating fleet that will continue over the next decade and beyond. Concurrent with this transition, EEI member companies are investing significant amounts of capital—nearly 120 billion dollars in 2017 alone—to make the energy grid smarter, more dynamic, more flexible, and more secure in order to integrate and deliver a balanced mix of resources from both central and distributed energy resources to customers.

The regulatory environment is undoubtedly pushing toward electric transportation, both in the U.S. and around the world. At the federal level, regulatory programs require an increasing shift toward Electric Vehicles (EVs). There is also a global movement to adopt electric transportation targets—at least 10 other countries across Europe and in Asia have EV sales targets in place. California and several other states have also pushed to increase electrification as a method of addressing local energy and air quality challenges via the Zero Emission Vehicle (ZEV) program. Many of EEI's members also are actively involved in the development of the regulations, financial incentives, and infrastructure for

commercial deployment of EVs and plug-in hybrid EVs.<sup>1</sup> EVs will undoubtedly play an important part of the range of technologies and measures needed to reduce reliance on imported fuels, maintain a balanced energy mix, and reduce Greenhouse Gas (GHG) and other emissions.

### **EPA Should Limit the Scope of Criteria for DC EVSE's**

EPA should limit the scope of the criteria it establishes for DC EVSE's and only create criteria for the "no vehicle mode", analogous to the existing criteria for Level 1 and Level 2 Alternating Current (AC) EVSE. EPA has proposed to set criteria for "no vehicle mode", "operation mode" (charging vehicle mode), along with optional connected functionality criteria. Currently, only Level 1 and Level 2 AC EVSE's have criteria for "no vehicle mode", "partial on mode", and "idle mode", along with optional connected functionality. EPA should retain the Level 1 and Level 2 criteria framework, given the wide variety and setups of charging systems, the lack of approved testing procedures for these systems, and the wide variability of input power with DC EVSE's.

First, there is significant variety in the type, design and deployment of current charging systems—different DC EVSE's have different features. Some DC EVSE's include isolation transformers, while others do not; some may include cooling systems, while others may not; some use air cooling while others use liquid cooling systems. As a result of this variability, efficiency values can vary significantly in a constant current mode as compared to a constant voltage mode of operation.<sup>2</sup> This variability makes setting a standard for operational mode challenging.

Second, there is no consensus-based or American National Standards Institute (ANSI) approved efficiency test procedure for these systems. Different manufacturers may define their product "efficiency" in different manners using different test methods and/or procedures. The lack of a defined test-procedure makes compliance with any specification set by the agency challenging—EPA should wait for ANSI to approve a test procedure in advance of establishing any standards.

Third, if the measured efficiency varies significantly during a charge, or varies by the amount of AC input power, certain criteria may actually prohibit otherwise efficient operations. For instance, EPA's proposed criteria could require the efficiency be at least 93 percent at all times and at all input power levels. However, this type of criteria would

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<sup>1</sup> EEI's members are involved in a range of regulatory proceedings regarding EVs and their deployment. As of now, more than 30 EEI member companies have proposed or are implementing EV-related pilots and programs in more than 20 states. These programs represent more than \$2 billion worth of potential investment in EV infrastructure and deployment.

<sup>2</sup> Idaho National Laboratory, "DC Fast Charger Fact Sheet: ABB Terra 53 CJ charging a 2015 Nissan Leaf", June 3, 2016, <https://avt.inl.gov/sites/default/files/pdf/evse/ABBDCFCFactSheetJune2016.pdf>

shut out a charger that is 92 percent efficient for some of the charge but 98 percent efficient during the majority of the charge cycle, when efficiency matters most. This creates a perverse result that EPA should avoid.

Therefore, given the wide variety and setups of charging systems, the lack of approved testing procedures for these systems, and the wide variability of input power with current chargers, EPA should only create criteria for the “no vehicle mode” analogous to the criteria for Level 1 and Level 2 AC EVSE.

### **EPA Should Not Address Wireless EV Charging at this Time, and Does Not Need to Include Information on Liquid-Filled Distribution Transformers**

EPA requests comment, as part of the discussion guide and webinar slides, on whether the Agency should consider including wireless charging units as part of the proposed specifications. EPA should not include wireless charging at this time for a variety of reasons, including that it is not clear whether EPA wants to review stationary (car) or dynamic (car in motion) wireless power transfer systems, which would significantly impact the analysis needed. Second, the number of wireless systems being used by electric vehicles is very limited at the current time, and as such data might not be robust enough for the Agency to set a robust and effective voluntary specification. Third, there are a limited number of manufacturers who produce wireless charging systems, further limiting the data available for EPA to set a standard at this time.<sup>3</sup> Fourth, there are significant differences in performance based on power ratings and air gap distance of wireless chargers.<sup>4</sup> Fifth, most electric vehicles for sale are not currently designed for wireless charging, only two manufacturers in Europe have announced plans to install wireless charging in 2018, and only on existing plug-in hybrid electric models.<sup>5</sup> Given the lack of available data and the clearly emerging nature of wireless charging, EPA should avoid setting specifications for this segment of the charging industry at this time.

The Agency also requests comment on whether purchasers would benefit from the *Energy Star Distribution Transformers Buying Guide* document. However, since the primary purchasers of distribution transformers are electric companies and not the end-use consumer, it is not clear that providing the extra information as part of these specifications would be beneficial—electric companies are well acquainted with

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<sup>3</sup> There is only one company (as of April 2017) that sells wireless EV charging technology for the consumer market, see: <https://cleantechnica.com/2017/04/13/11-billion-electric-miles-usa-1-million-wireless-ev-charging-hours/>.

<sup>4</sup> See <http://www.oh3ac.fi/EVS27-2440228.pdf>, and <https://web.stanford.edu/group/peec/cgi-bin/docs/events/2014/10-24-14%20Mi.pdf>.

<sup>5</sup> See <https://about.bnef.com/blog/wireless-ev-charging-available-18-months-2-years-says-qualcomm-qa/>.

transformer options available to them.<sup>6</sup> To the extent that commercial customers purchase transformers, they typically only purchase dry-type transformers for end-use purposes, which is only one small part of the information covered by the Energy Star buying guide. Should EPA choose to provide extra information, it should focus on providing information regarding dry-type transformers that are used to serve individual or multiple DC EVSE's.

### **EPA's Should Adopt a Similar Approach for Direct Current EVSE's**

The Agency's definition of "no vehicle mode" for times when the EVSE is not connected to an electric vehicle but is still using electricity when utilizing AC EVSE charging is also applicable to DC EVSE's, and the Agency should adopt a similar approach to have a base power allowance and additional allowances for different (or multiple) communication systems used by the EVSE. This flexibility will ensure that "smart" DC EVSE's will be able to communicate with connected entities such as consumers, building owners, and utilities helping to foster a smarter and more dynamic energy grid.

Additionally, EPA should consider providing separate allowances for secondary and tertiary functions available with DC EVSEs, including lighting (for displays or night-time location visibility), cooling systems (for EVSE and/or cables), heating systems, and battery banks (for backup power or kilowatt demand reduction or charging).

### **For Connected Functionality, EPA Should Take the Same Approach as With AC EVSE's**

The approach taken by EPA with Level 1 and Level 2 AC EVSE's provided important flexibility for a still burgeoning industry. The same approach should be taken for DC EVSE's. As discussed by EPA at the AC EVSE webinar in 2016, "Under this proposal, EVSE *need not ship with DR capability* so long as it is capable of supporting DR; for example, through integration with a 3rd party service or via a software/firmware revision." Since not all DC EVSE's will participate in demand response (DR) programs, this helps to ensure that these DC EVSE's will still be able to qualify for the Energy Star program by meeting all of the other requirements. EPA should avoid being overly prescriptive in setting any specifications here to ensure that all communication pathways are treated equally and none are unfairly favored.

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<sup>6</sup> See *Energy Star Distribution Transformers Buying Guide*, available at: <https://www.energystar.gov/sites/default/files/asset/document/Transformers%20Buyer%207s%20GuideFinal10-16-17.pdf>. "The primary audience for the buying guide is *utility purchasers*, but the guide should also be useful to other purchasers of applicable transformer types including military bases, corporate and college campuses, and solar and wind developers." (*emphasis added*).

## Information on Power Factor Should be Provided

As EPA did with AC EVSE's, EPA should also require manufacturers to provide power factor information for DV EVSE's as part of the program. Since DC EVSE's will likely be installed at commercial or industrial facilities, it is much more likely that the facility will be required to monitor its overall power factor and maintain a minimum power factor. If EPA finds that equipment has a range of power factors, then there should be a minimum power factor required to be eligible for the Energy Star logo (e.g., at least 90%) in order to encourage the use of equipment with good to excellent power factors (in any mode of operation). Since there is no "off mode" state for DC EVSE's, and they are either in a "no vehicle mode" or "operation mode" footing which use electricity 24 hours per day, it is essential that these chargers have a minimum power factor so as to allow grid operators to manage their connection to the grid effectively.

Thank you for your review and consideration of our comments. Please contact Steve Rosenstock (202-508-5465, [srosenstock@eei.org](mailto:srosenstock@eei.org)) if you have any questions about EEI's comments.

Respectfully submitted,



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cc: Alex Bond  
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