July 27, 2020

Mr. James Kwon
ENERGY STAR Program
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue NW
Washington, DC 20460

Dear Mr. Kwon:

This letter comprises the comments of the Pacific Gas and Electric Company (PG&E), San Diego Gas and Electric (SDG&E), and Southern California Edison (SCE) in response to the United States (U.S.) Environmental Protection Agency (EPA) request for comment on Draft 1 of the ENERGY STAR® Electric Vehicle Supply Equipment (EVSE) Specification Version 1.1, as well as the Final Draft Test Method for EVSE.

The signatories of this letter, collectively referred to herein as the California Investor-Owned Utilities (CA IOUs), represent some of the largest utility companies in the Western U.S., serving over 32 million customers. As energy companies, we understand the potential of appliance efficiency standards to cut costs and reduce consumption while maintaining or increasing consumer utility of products. We have a responsibility to our customers to advocate for standards that accurately reflect the climate and conditions of our respective service areas, so as to maximize these positive effects.

We applaud EPA for expanding the ENERGY STAR EVSE Specification to include Direct Current (DC) Fast Chargers. Our current projections show electric vehicles (EVs) as a major new source of electricity consumption during the next decades, particularly in the state of California. The service life of EVSE devices is expected to be about ten years (roughly the same as EVs), and a great deal of electricity will flow through all of the EVSE that will be installed during the next decade with profound implications for the electricity distribution grid. As such, it is critical to support the installation of the most energy efficient EVSE as practical, and to help ensure that EVSE works with the grid to provide reliable and affordable service to EV owners.

1. **The CA IOUs recommend that EPA consider more stringent energy efficiency requirements for DC Fast Chargers in Version 1.1 of the EVSE Specification.**

   In the past, ENERGY STAR has typically set efficiency requirements to provide a consumer recognition label for only the most efficient 15 to 20 percent of products available on the market for well established product categories. However, ENERGY STAR occasionally sets the energy efficiency requirements significantly lower to allow a much larger share of products on the market to qualify, to improve consumer acceptance of emerging technologies that compete with legacy technologies in common consumer products.[1] Although EVSE is in the category of emerging technology displacing conventional (i.e., fossil fuel) transportation, we anticipate an outsized impact on the national electric grid and renewables integration as compared to other

[1] For example, this was EPA's approach with compact fluorescent lamps.

consumer products. Because of this, we recommend setting efficiency requirements closer to the top 15 to 20 percent of the market, rather than any lower threshold.

EVs are increasing in availability and popularity, with dozens of all-electric or plug-in hybrid models available on the U.S. market and annual sales over 350,000 units. In 2018 California led the U.S. with 48.6 percent of all U.S. EV sales. As a result of this growth, EVSE is being broadly installed for the first time across the U.S., particularly in California. In the U.S. there are currently over 4,700 public DC Fast Charging stations with more than 16,800 ports and more than one quarter of these chargers are currently installed in California.[2] In June 2020 the Electrify America project announced that it would add an additional 3,500 DC Fast Chargers to its current network of 1,900 by the end of 2021.[3] See Figure 1 for the Electrify America DC fast charging network.

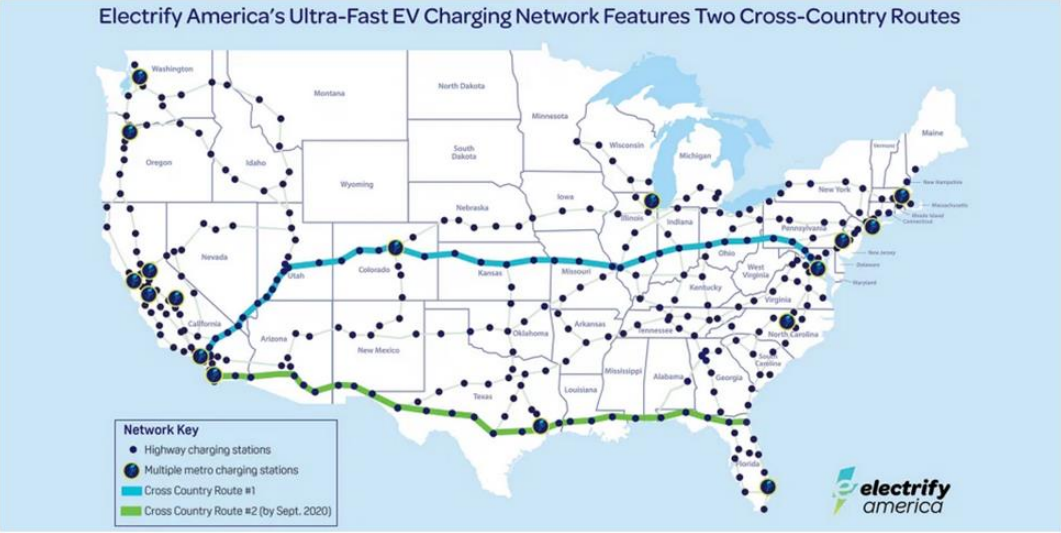

Figure 1: Electrify America's DC Fast Charger network.
Source: Electrify America.[4]

Light-duty passenger EVs are only part of the transportation electrification trend. In June 2020 the California Air Resources Board (CARB) passed the Advanced Clean Trucks Regulation.[5] Recently, fifteen other states, the District of Columbia, and 37 truck fleet operators have indicated that they will follow suit.[6] CARB's rule requires that by 2045 all new trucks sold in California be zero-emission, with a phase-in of regulations beginning as soon as 2024. With this increase in electric trucks, places like ports, railyards, distribution centers, and freight corridors will need to install heavy-duty DC Fast Chargers to enable new electric trucks across the state to charge as seamlessly as diesel and gasoline trucks fuel now. Historically, the CA IOUs have offered incentives on ENERGY STAR qualified products to help support the adoption of higher efficiency models.[7] In order for utilities to offer incentives on ENERGY STAR qualified DC Fast

[2] U.S. Departement of Energy Alternative Fuels Data Center Alternative Fueling Station Locator filtered for DC Fast Chargers as of July 24, 2020.
[3] Electrek, Electrify America Completes its First EV Fast-Charging Cross-Country Route, 2020.
[4] Electrek, Electrify America Completes its First EV Fast-Charging Cross-Country Route, 2020.
[5] https://ww2.arb.ca.gov/news/california-takes-bold-step-reduce-truck-pollution
[6] "15 states, DC will collaborate on 100% electric truck sales by 2050" https://www.utilitydive.com/news/electric-trucks-EV-CARB-NESCAUM-Northeast-states-emissions/581569/
[7] PG&E Residential Rebates Catalog, 2020; LA DWP Efficient Product Marketplace

Chargers, we must have confidence that there will be meaningful energy savings associated with them.

Only limited data are available so far on how drivers actually use DC Fast Chargers, but these devices are certainly capable of transferring, and consuming, large amounts of electricity. With increased EV adoption, DC Fast Charger efficiency will have a significant impact on electricity demand across the U.S. The National Renewable Energy Laboratory (NREL) 2019 DC Fast Charging power integration model estimated that a DC Fast Charging station with four ports would experience 50 charges per day at 38 kilowatt (kW)-hours per charge for a total of 690 megawatt-hours/year per station.[8]

In addition to energy savings, a more stringent ENERGY STAR efficiency requirement for DC Fast Chargers would also set the stage for the commercialization of energy efficient power electronics technology with applications far beyond EVSE. The U.S. Department of Energy (DOE) Power America initiative has supported the power electronics industry's recent advances in silicon carbide and other "wide-bandgap" semi-conductor-based devices (e.g., GaN) that enable more efficient DC Fast Chargers.[9] By encouraging broader adoption of wide-bandgap power electronics, more stringent ENERGY STAR efficiency requirements for EVSE DC Fast Chargers would increase production volumes and bring down prices for this technology. Cheaper, wide-bandgap power electronics could allow more efficient on-board EV battery chargers,[10] inverters for photovoltaic power generation, distribution transformers, and other high-capacity power electronics applications across the electricity distribution grid.

The CA IOUs strongly recommend that EPA strengthen the energy efficiency requirements for DC Fast Chargers in the ENERGY STAR EVSE Specification Version 1.1. More stringent requirements will encourage the expanding DC Fast Charger networks, both in California and across the U.S., to use energy efficient technologies and to promote other efficient power electronics applications.

2. The CA IOUs recommend that Operation Mode Requirements for DC-output EVSE be extended to cover a larger scope of DC Fast Chargers.

As discussed above, the CA IOUs believe that it is critical to help ensure that the EVSE installed during the broad adoption of EVs are as energy efficient as possible. The current draft of the ENERGY STAR EVSE Specification would only impose energy efficiency requirements on DC Fast Chargers rated at or below 65 kW. However, two of the largest[11] and fastest growing networks of DC Fast Chargers - the Tesla Supercharger[12] and Electrify America[13] networks – include only DC Fast Chargers rated above 65 kW. Most DC Fast Chargers installed to serve busses and larger trucks will likely also be rated above 65 kW. This suggests that the proposed energy efficiency requirements in the ENERGY STAR for EVSE Version 1.1 Specification would not apply to most of the DC Fast Chargers that will be installed. The CA IOUs recommend

[8] NREL, Electricity Cost for Electric Vehicle Fast Charging, 2019. In a 2015 Idaho National Laboratory (INL) study, high traffic corridors, such as near Seattle and Tacoma, Washington, had over 42 charging events per week INL, DC Fast Charger Usage in the Pacific Northwest, 2015, page 2, Figure 2.
[9] https://poweramericainstitute.org/
[10] "Silicon carbide shows clear benefits for electric vehicle efficiency" https://www.automotiveworld.com/articles/silicon-carbide-shows-clear-benefits-for-electric-vehicle-efficiency/
[11] According to DOE's Alternative Fuels Data Center, Tesla Superchargers currently account for 54 percent of all DC Fast Charger outlets installed in the U.S.
[12] Tesla, Introducing V3 Supercharging, 2019. Version 3 supercharger supports up to 250 kW per car.
[13] Electrify America, Designing and Deploying More Than 2000 Ultra-Fast Vehicle Chargers Across the US, 2018.

that EPA expand the range of EVSE covered by Version 1.1 to include DC Fast Chargers rated up to 400 kW, in order to harmonize with SAE J1772, This would cover most if not all DC Fast Chargers intended for use by light-duty passenger vehicles, as well as DC Fast Chargers for some vans, trucks and buses.

3. The CA IOUs recommend that EPA harmonize with federal and/or California battery charger test procedures and standards.

In 2013 and 2014 California appliance energy efficiency standards for residential and commercial battery chargers (respectively) came into effect. Oregon then adopted similar standards that took effect in January of 2014. In 2018 the DOE residential battery chargers standard preempted California and Oregon standards for residential battery chargers, but not for commercial battery chargers. The energy efficiency metric developed by DOE was different than the one adopted by California and Oregon, though the level of stringency was roughly equivalent. Automotive applications for battery chargers were not covered by either the state or federal battery charger standards.

The CA IOUs are concerned that requiring manufacturers who produce both non-automotive battery chargers and DC Fast Chargers, as well as the laboratories that test both products, to use two different efficiency metrics will result in additional costs. For larger non-EV battery chargers, the charging function described in the state and federal standards seems to be the same function performed by DC Fast Chargers as defined by ENERGY STAR for EVSE. The CA IOUs request that EPA base the DC Fast Chargers efficiency metric in the ENERGY STAR EVSE Specification on the battery charger metric in the DOE federal standard, if appropriate, or explain why a different metric is needed.

4. The CA IOUs recommend that EPA include a provision for wireless EVSE in the next version of the ENERGY STAR EVSE Test Method and Specification.

Wireless EV charging is emerging in the market. For example, a wireless charging manufacturer Plugless Power has demonstrated over one million charging hours in the field on its wireless charging equipment.[14] This equipment is currently compatible with select EVs from Tesla, Nissan, Chevy, and BMW.[15] The Plugless Power second generation charging system is rated for 7.2 kW, delivered wirelessly to the EV.[16]

As this is an emerging market with potential charging product lifetimes comparable to conventional EV charging equipment (i.e., ten years), setting early efficiency benchmarks both encourages efficient product development and avoids the accumulation of lost savings attributable to less efficient deployed products. Different types of EVSE are inherently more or less energy efficient than others. For example, Level 2 charging is more efficient than Level 1,[17] and there are also significant efficiency ranges within the different types of EVSE, including wireless EVSE.

The CA IOUs recommend that EPA collect data on the range of wireless EV charger efficiencies currently available on the market and that DOE consider including wireless EV chargers under the next revision to the ENERGY STAR for EVSE specification.

[14] https://www.pluglesspower.com/learn-about-plugless/
[15] https://www.pluglesspower.com/shop/
[16] Plugless Power, Second Generation Plugless Technical Specifications
[17] "Level 1 vs Level 2 EVSE Energy Consumption of Production Electric Vehicles" research by Nissan, presented at the EPRI IWC, March 12, 2020

We thank EPA for the opportunity to be involved in this process.

Sincerely,

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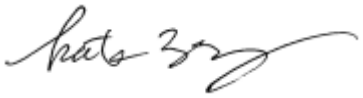

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