July 26, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Proposed Amendments to Advanced Clean Cars II

To Staff of the California Air Resources Board,

ABB E-mobility appreciates the opportunity to submit comments in response to the proposed amendments to Advanced Clean Cars II (ACC II) as presented in the workshop on June 26, 2024. ABB E-mobility shares CARB's vision for improving the charging experience for drivers. An important keystone of achieving that is broad interoperability between vehicles and chargers across any charging network.

ABB E-mobility has been manufacturing EV chargers for the US market for over a decade and is the leading manufacturer of electric vehicle chargers globally, having sold more than 1 million electric vehicle chargers, including 50,000+ direct current fast chargers (DCFC). ABB E-mobility has been manufacturing EV chargers in the US since 2019 and beginning in early 2023, began expanded US manufacturing operations, in part, to meet Build America, Buy America Act requirements. ABB E-mobility can produce up to 10,000 chargers per year, ranging from 20kW to 600kW in power, meeting the needs of public charging, transit and school buses, medium- and heavy-duty vehicles, and fleets of all kinds.

As a long-time member of the e-mobility industry, ABB E-mobility is actively involved in developing not only charging technology, but also industry-wide standards for both hardware and software interoperability. ABB E-mobility serves on the Steering Committee for CharIN and actively participates in industry development of standards and conformance testing procedures with International Organization for Standards (ISO),

Figure 1. ABB E-mobility Public Charging Reference

International Electrotechnical Commission (IEC), Open Charge Alliance (OCA), SAE, American National Standards Institute (ANSI), and more.

Adapters

ABB E-mobility cautions that adapters create a layer and barrier between the vehicle and the charger that can impact charging experiences in a few ways:

1. Interoperability and Feature Implementation: A charger and vehicle may not be able to "see" the adapter, collect data from it, and give it commands. As such, certain features that are more easily implemented between charger and car may run into interference.

2. Safety: Adapters create some safety challenges. For example, adapters may affect the ability of the pins inside the connectors and adapters to properly couple with the inlet, causing the potential for arcing events. Additionally, most connectors and inlets have temperature sensors that can monitor the temperature of the pins and then signal the charger to reduce the current delivered or ask the vehicle to request less current in order to prevent overheating. Adapters typically don't have such sensors or a way to communicate with the charger and vehicle. Without such sensor and "smarts" the pins are at risk of melting or causing heat damage. Further, with adapters, there is risk that AC or DC power from the chargers can get routed through the incorrect pins, which can cause catastrophic failure of the charging session. The current field of Type1/CCS1 chargers and vehicles are not designed to cope with the AC over DC design of SAE J3400.

3. Power Output: adapters can often "derate" the amount of power delivered from a permanently attached connector. In part, this is because cooling and mitigating temperature build up is much harder with an adapter placed between the connector and the vehicle. The user experience would suffer because adapters would "de-rate" the amount of power a driver would other expect to receive.

4. Reliability: the use of adapters introduces a new potential failure point to the charging experience which can negatively impact sessions success rates and further frustrate drivers. These concerns are magnified because adapters a nascent offering without a track record. The use of adapters would likely make reaching 97% charger uptime or a 90% successful charge attempt rate elusive.

To help mitigate some of these concerns, ABB E-mobility recommends that CARB consider the inclusion of adapter safety requirements as it seeks to improve interoperability and the charging experience. One example of an adapter safety requirement is UL 2252 which is currently under development. However, UL 2252 only covers safety aspects of adapter, not functional aspects. Only requiring UL 2252 will not address the full operational features of the adapter, which could lead to misuse and poor customer experience.

Plug & Charge via ISO 15118-2 and DIN 70121
ABB E-mobility supports CARB's proposal to require the Plug & Charge capability for battery electric vehicles (BEVs) starting model year (MY) 2028 via ISO 15118-2. ABB E-mobility cautions against including DIN 70121 as a requirement because it does not provide plug and charge functionality, it is not compatible with ISO 15118-2, and it does not include cybersecurity protection such as authentication and encryption. Requiring ISO 15118-2 will enhance the driver experience and harmonize interoperability requirements for both vehicles and electric vehicle service equipment (EVSE).

While industry vetted conformance tests and certifications for ISO 15118-2 are currently under development, such as CharIN CCS Extended, ABB E-mobility recommends that CARB consider self-certification and demonstrated interoperability testing between vehicle OEMs and charging manufacturers/networks as a viable first step. ABB E-mobility cautions against jumping to requiring third party conformance testing prior to these certifications being finalized for several reasons. First, the available testing laboratories are all very new to these standards. As such, they do not yet have a comprehensive understanding of the requirements and regulations needed to set up an accredited certification program. Second, the hardware portions of the standards, like electromagnetic compatibility (EMC) requirements, are not well developed and there are differences between the US and Europe. Third, technical personnel resources are extremely limited across the industry, and this can inadvertently cause delays in testing despite product readiness.

Additionally, in response to CARB's reference to SAE J2953/3, ABB E-mobility advises while these test cases are documented in this standard, they are not certifiable because they require pair to pair testing between each individual EV and unique EVSE. The result will not be repeatable among additional pairings of EVs and EVSE.

ABB E-mobility would be supportive of CARB holding a workshop dedicated specifically to conformance testing. Should conformance certifications be adopted as a requirement in the future, CARB should ensure that industry has time to evaluate the test and availability of conformance certification labs. There should also be parity for both automakers and EVSE when it comes to testing requirements.

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Thank you for the opportunity to provide comments on the proposed amendments for Advanced Clean Cars II. Our goal is that this is just the beginning of a broader conversation between CARB staff and ABB E-mobility's interoperability experts. ABB E-mobility shares CARB's interoperability vision, and we are eager to participate in future conversations.

If you have any questions or want to discuss any of these topics further, please do not hesitate to reach out to Alex Ehrett, Public Policy & Market Development Manager, at alex.ehrett@us.abb.com.

Respectfully submitted,

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ABB E-mobility