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Hubject comments

Additional submitted attachment is included below.

April 15, 2026

California Energy Commission
Docket Unit, MS-4, Docket No. 22-EVI-06
715 P Street
Sacramento, CA 95814

RE: Exploring Plug & Charge and Roaming Regulatory Concepts - Docket No. 22-EVI-06

Dear Acting Director Kalafut and Fuels and Transportation Staff,

Hubject submits these comments in response to Docket No. 22-EVI-06. Hubject operates the world's largest Plug & Charge ecosystem, public key infrastructure (PKI), and roaming platform connecting charging station operators, charging network providers and eMobility service / billing providers across North America and globally.

The comments below address ISO 15118 and Plug & Charge standards, OCPI and network roaming, and conformance testing. Hubject's recommendations are guided by the following consistent principles: standards should reflect current market readiness and establish clear, implementable minimums; they should create a credible pathway to next-generation requirements as the ecosystem matures; and they should expand driver choice, accelerate scale, and advance interoperability across the full charging ecosystem.

I. ISO 15118 AND PLUG & CHARGE

A. ISO 15118 appropriate minimum

Hubject believes **ISO 15118-2 is an appropriate minimum standard**, as it is the most widely adopted Plug & Charge standard amongst auto-OEMs, charging station operators, and charging network providers alike. Hubject currently notes over 1 million vehicles on North American roads (and 5 million globally) supporting the -2 standard, the majority of which are in California. The -2 standard has been adopted by 17 auto-OEMs and is available on approximately 100,000 charging ports in the United States.

B. ISO 15118-20 readiness, cybersecurity, hardware, backward/forward compatibility

ISO 15118-20 represents the next generation of the standard and offers meaningful improvements to multi-contract handling, cybersecurity, bidirectional charging and support for wireless power transfer. However, -20 is not backwards compatible with -2 and therefore will take 2 to 3 years to scale with the next generation of passenger vehicles. Importantly, the sector where Hubject has seen adoption of -20 leapfrog -2 is amongst commercial vehicles, particularly heavy duty and transit.

Hubject is supportive of the CEC introducing a -20 standard that reflects the varying maturity of sectors and provide adequate time for the industry participants to meet those requirements.

To ensure maximum ecosystem security, Hubject recommends following the complete specifications of either ISO 15118-2 or ISO 15118-20. Partial implementation may lead to security gaps; therefore, the selected standard should be applied in its entirety to satisfy all cybersecurity mandates.

C. Plug & Charge for AC and DCFC

The communication protocol for ISO 15118 & Plug & Charge is the same for both AC and DC charging. There are differences in the charging flow but the certificate handling, which enables cybersecurity, and the messages for Plug & Charge are the same. Hubject does note, however, that legacy hardware and missing connectivity (e.g., networked chargers) are likely limiting factors for AC charging.

D. Public Key Infrastructure (PKI) Support & Multi-contract handling

Hubject supports CEC engagement on public key infrastructure as a critical enabler for Plug & Charge at scale. Hubject supports the **Certificate Trust List (CTL) approach** as the preferred framework for PKI governance in California.

Hubject also recommends that the CEC engage on the issue of **multi-contract handling**. Currently, not all auto-OEMs permit drivers to install third-party contracts in the vehicle, which means Plug & Charge can effectively be locked to a single eMSP or billing provider chosen by the OEM.

For individual drivers, enabling multi-contract handling would give drivers meaningful choice in their billing provider and allow commercial charging station operators and charging network providers to compete on equal terms.

For fleet operators, enabling multi-contract handling enables the seamless integration of third-party fleet fuel card providers allowing fleets to maintain centralized billing and manage mixed-energy portfolios opposed to fragmented, specific payment silos.

Hubject points to the European Union's governance framework for public charging, developed by the Sustainable Transport Forum and enacted through the AFIR regulation, as a model for how regulators have addressed this issue.

II. OCPI AND NETWORK ROAMING

A. OCPI 2.3

Hubject notes most charging station operators and charging network providers are still using OCPI v2.1.1 or OCPI v2.2.1. and there are practical limitations to a v2.3 standard related to network readiness and development timelines. Transitioning to v2.3 will be a considerable challenge for both charging station operators, charging network providers and eMSP / billing providers to implement and fully test before deploying it in the field. Hubject also believes that the benefits v2.3 offers over 2.2.1 are marginal in terms of functionality for the user.

Further, Hubject sees OCPI 2.2.1 as a significant improvement over 2.1.1 and more appropriate for roaming and notes many charging station operators, charging network providers have either recently announced or plan to make the transition to 2.2.1.

Hubject strongly recommends **OCPI 2.2.1** be considered the minimum standard with specification provided including the modules that need to be implemented to ensure interoperability.

B. Roaming and Enabling Plug & Charge at scale

Hubject recognizes a limiting factor to Plug & Charge interoperability is the back-end connection between charging station operator, charging network provider and eMSP/billing provider required to authorize a Plug & Charge session (once it has been authenticated). Roaming, whether bilaterally or via roaming hubs provides such connection to facilitate Plug & Charge at scale. Since its founding in 2012, Hubject has been a strong supporter of roaming globally as a means of expanding accessibility, interoperability and enabling driver choice when it comes to how they find, use and pay for charging.

Hubject recommends the CEC consider a **minimum roaming standard based on OCPI** to enable Plug & Charge at scale. Hubject also refers the CEC to the European Union's Alternative Fuels Infrastructure Regulation (AFIR)¹ effective from April 13, 2024, which mandates that public EV charging stations operators and charging network providers offer interoperable, transparent, and user-friendly charging with mandatory e-roaming. The regulation provided the foundation for interoperable charging at scale across multiple countries and thousands of charging network providers and eMSPs / billing providers

Additionally, Hubject recommends the CEC consider the impact of **multi-contract handling** (see 1d above) in enabling the driver to choose the eMSP / Billing Provider of their choice to enroll and use Plug & Charge on their enabled vehicle

C. OCPI implementation

A key challenge that warrants additional discussion is the **specific OCPI modules implemented by the CPOs and eMSPs**. While not all modules are required to initiate a roaming connection, there are specific modules necessary to support roaming. Hubject supports the CEC in further exploration of the OCPI protocol and the minimum OCPI modules required for roaming.

III. CONFORMANCE TESTING

A. Accelerating availability of Plug and Charge

Hubject holds, that in addition to **standardized implementations** of 15118 and OCPI, requiring charging network providers and eMSP / billing providers to **prioritize roaming integrations** is the fastest way to drive interoperable Plug & Charge (see II.B, above)

B. Two-Layer Testing Framework

Hubject recommends that the CEC adopt a two-layer testing framework:

- **Protocol conformance testing** under ISO 15118-4 and -5, focused on EV-to-EVSE communication. Test cases should cover both success scenarios and common failure modes, including invalid, expired, and revoked certificates.
- **End-to-end interoperability testing**, focused on the full authentication and authorization flow from the vehicle through the CNP to the eMSP / billing provider via the roaming layer. This layer should address

¹ More information regarding AFIR is available here: eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32023R1804&qid=1718366073807

common failure modes in backend communication, including invalid or expired payment credentials and connectivity issues between network components.

Protocol conformance testing alone is insufficient to validate the end-to-end charging experience. Both layers are necessary.

IV. CONCLUSION

In closing, Hsubject appreciates the CEC's leadership in advancing an interoperable, secure, and user-friendly charging ecosystem. We encourage the CEC to establish clear minimum requirements that reflect current market readiness, recognizing **ISO 15118-2 as an appropriate baseline for Plug & Charge** while creating a practical pathway to ISO 15118-20—paired with **OCPI 2.2.1 as the minimum roaming standard** and guidance on the OCPI modules needed for true interoperability.

In parallel, engagement on PKI governance support for **multi-contract handling** to preserve driver and fleet choice, and adoption of a two-layer conformance and end-to-end interoperability testing framework will help reduce fragmentation and accelerate reliable Plug & Charge at scale.

Hsubject stands ready to support the Commission's continued stakeholder process with technical input and implementation experience.

Thank you for your consideration,

Trishan Peruma
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