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April 15, 2026

California Energy Commission
715 P Street
Sacramento, CA

Re: Docket No. 22-EVI-06
SWTCH comments on plug-and-charge and roaming concepts

Dear Energy Commission Staff:

SWTCH respectfully submits these comments to offer its perspective on several of the questions that Commission staff posed in the Plug & Charge and Roaming Concepts Workshop on March 25, 2026.[1]

About SWTCH

With more than 20,000 chargers on its network, SWTCH is a leading provider of electric vehicle (EV) charging and energy management solutions across California and North America. SWTCH's holistic technology solution allows it to help building owners and operators cost-effectively deploy and scale multi-vehicle charging systems. SWTCH's charging management system (CMS) is built on a foundation of open communication standards and interoperability to prevent stranded assets and enable future flexibility, scalability, and innovation.

Comments

1. Is ISO 15118-2 appropriate as a minimum?

   SWTCH response: If the CEC plans to require ISO 15118, then ISO 15118-2 is appropriate to establish as the current minimum version, in part because no conformance test is available yet for ISO 15118-20. If CEC establishes a regulation requiring ISO 15118-2 as a minimum, SWTCH strongly encourages the CEC to ensure that it is a floor and not a ceiling; it is important for the CEC to allow other solutions with a reasonable path to market more quickly than waiting for all the auto OEMs and EV charging companies to support ISO 15118-2, which may take several years.

   Is ISO 15118 an open standard? SWTCH supports ISO 15118 as the preferred long-term standard for vehicle-to-grid communication. Indeed,

[1] California Energy Commission. Docket No. 22-EVI-06. March 25, 2026. Plug & Charge and Roaming Concepts Workshop. TN #269308.

SWTCH is broadly supportive of open standards because they enable greater competition, technological innovation, and interoperability — all of which benefit the end user. However, to address the immediate question about whether ISO 15118-2 is appropriate as a minimum standard, it's worth considering the extent to which ISO 15118 itself can be considered to be an open standard.

There's no question that ISO 15118 is an open standard in terms of how it is developed. But when one considers how it is being implemented and which market actors have access to utilize it, SWTCH does not view it as an open standard. Auto OEMs currently hold the leverage to determine which charging networks they allow to have access to their makes and models of vehicles via ISO 15118.

To offer a contrasting example, OCPP is a standard that establishes a common communication protocol between charging networks and chargers.[2] In terms of how the two standards are developed, both OCPP and ISO 15118 have been developed through an open, non-proprietary process. The two standards differ, though, in terms of implementation and access. Any charging network, hardware company, or e-mobility service provider can implement OCPP as intended, to serve as a universal communication protocol within the EVSE ecosystem. In contrast, as noted above, auto OEMs can deny plug-and-charge access via ISO 15118 to any networks they choose.

As SWTCH notes in its response to Question 5 below, SWTCH supports a strong role for a neutral, third party such as the CEC to serve as a trusted clearinghouse for approving PKIs that all parties including both auto OEMs and charging providers must accept.

While SWTCH supports ISO 15118 as the preferred long-term standard, it is not the only solution that enables a plug-and-charge experience. A significant gap remains for the millions of legacy EVs in North America (not to mention the upcoming Chinese EVs entering the Canadian market, many of which we can expect will travel south of the border) that do not support full certificate-based ISO 15118 Plug & Charge. To provide these drivers with a seamless experience, the CEC should ensure that its support for ISO 15118-2 does not preclude other viable interim solutions such as Autocharge that can provide drivers with a plug-and-charge experience in the near term.

While Autocharge has historically been criticized for security vulnerabilities such as static MAC addresses, the industry is moving toward a mainstream solution that addresses these weaknesses. As an example, the Electra Autocharge Roaming initiative developed a

[2] In 2024, OCPP 2.0.1 was formally established as a standard via IEC 63584.

cryptographic framework that is now being integrated into the upcoming OCPI 3.0 roaming standard.

There are three primary reasons why the CEC should enable entities to continue developing and implementing other plug-and-charge pathways in parallel with ISO 15118-2: speed to implementation; encouraging continued technological innovation; and enabling greater market competition that delivers more flexibility and cost-effective solutions.

- Speed to implementation: It will likely take several years for all of the major auto OEMs and EVSE companies to implement ISO 15118-2. By ensuring that entities retain the flexibility to pursue other pathways such as AutoCharge in parallel, the CEC can enable drivers to benefit from a plug-and-charge experience more quickly than waiting for full implementation of ISO 15118-2.

- Encouraging continued technological innovation: While SWTCH is a strong supporter of open standards and ISO 15118, there is also value in enabling continued technological innovation and bringing to market other plug-and-charge solutions that can improve the driver experience.

- Enabling greater market competition: If the CEC were to mandate that plug-and-charge must be achieved only through one prescribed pathway — e.g., ISO 15118 — the CEC would risk tilting the scale and favoring one solution and/or one type of entity over others. This would lessen the incentive for market participants to continue to compete and innovate to deliver the plug-and-charge experience more quickly and at lower cost.

2. Is the industry ready for ISO 15118-20 for Plug and Charge today, or will it be soon?

   SWTCH response: The industry is not currently ready to implement ISO 15118-20 for plug-and-charge. There is limited availability both in terms of the charging hardware and the auto makes and models.

   Moreover, although ISO provides a specific conformance test for ISO 15118-2 (defined in ISO 15118-4: Network and application protocol conformance test), it does not yet provide a conformance test for ISO 15118-20. The timing for ISO providing such a conformance test remains uncertain.

3. Are there cybersecurity, hardware, backward/forward compatibility, or other concerns to consider as part of a proposed minimum?

SWTCH response: CISA recently identified vulnerability associated with man-in-the-middle attacks. TLS 1.3 may eliminate that vulnerability, but TLS is not required for ISO 15118-2. It is recommended for ISO 15118-2 but required for ISO 15118-20.

4. How does the implementation of Plug & Charge for AC differ from DCFC (if at all)?

   SWTCH response: Technically the implementation is similar. For example, DC already shares some charging session information via the DC pins. In terms of cost, however, the main difference is the proportional amount of the expense of the hardware such as the physical modem. The cost is much higher as a proportion of the overall cost for an AC charger than a DC charger.

5. How should CEC support public key infrastructure (PKI) for Plug and Charge (this may include certificate authorities and certificate trust lists)?

   SWTCH response: One of the reasons for the slow and patchy adoption of plug-and-charge via ISO 15118-2 is related to PKI. The CEC, in its role as the government's policy, planning, and regulatory agency, can help accelerate adoption by taking a more active role when it comes to PKIs.

   SWTCH supports a more active role for a neutral, non-proprietary entity such as the CEC to first A) establish a system to approve certificate trust lists, and then B) mandate that entities accept networks and transactions through an approved trusted certificate. Otherwise, individual automakers may establish roadblocks that are unrelated to the safety and security of the PKI and will continue to slow adoption and implementation of plug-and-charge. SWTCH discusses this more in its response to Question 6 below.

6. What challenges with Plug and Charge implementation merit additional discussion?

   SWTCH response: There are two primary reasons for the slow adoption of plug-and-charge via ISO 15118-2:

   i. First, ISO 15118-2 requires CPOs and OEMs to use certificates. That means delegating the ultimate authority on the authentication of vehicles and chargers to the Root Certificate Authority (CA) that issues these certificates. CPOs and OEMs are often reluctant to surrender this authority and responsibility to third parties. This leads to jockeying and negotiation around which Root CAs may be included on vehicles. We've then seen other initiatives develop to manage these trusted certificate lists (CTLs) which in turn require an additional delegation of authority and trust.

Unless the government steps in and takes an active role in requiring that a certain PKI (or set of interoperable PKIs) has to be trusted, SWTCH expects the vision of a broadly interoperable plug-and-charge experience will remain out of reach.

ii. Second, many CPOs are reluctant to fully embrace plug-and-charge via ISO 15118 because it hides the identity of the driver from CPOs. While CPOs generally support the streamlined user experience that plug-and-charge enables, CPOs also tend to prioritize data such as driver PII. ISO 15118 rigidly enforces a distinction between CPO and MSP roles. Especially in the US and Canada, these roles have been mixed. For example, many CPOs have a direct relationship with the driver via a customer account that includes name, phone number, and billing information. However, when a plug-and-charge session is conducted via ISO 15118, the information the CPO receives is limited to the "contract certificate."

OCPI and Roaming:

1. Is OCPI 2.3 appropriate as a minimum?

   SWTCH response: Yes, OCPI 2.3 is the appropriate version to require as a minimum standard because it supports the continuing evolution and improvement of the EV driver experience. This includes support for Plug-and-Charge and AutoCharge; expanded data fields including for parking, people with disabilities, taxes, and the flexibility to define and add additional fields.

2. What challenges exist with transitioning to OCPI 2.3?

   SWTCH response: There is no certification process (yet) for OCPI 2.3 because it's not an international standard yet. One alternative could be for a company to provide an internal self-attestation. Depending on the timing of the CEC rulemaking — for example if it's complete by, say Jan. 1, 2027 and takes effect Jan. 1, 2028 — it's possible but not certain there may be an OCPI 2.3 certification process available by then. The timing depends on the extent to which the EV Roaming Foundation will prioritize making this certification available by then.

3. What challenges exist to developing or implementing roaming agreements between providers or networks?

   SWTCH response: Implementing a roaming integration requires a relationship with the roaming partner, setting up both backend and frontend IT, and training for operational staff to support it. But it is feasible.

The main challenge is whether a charging company is motivated to do it. In SWTCH's experience, many charging companies that are interested in establishing roaming integrations with other networks prioritize these prospective integrations according to network size. This advantages other larger, more established networks which often have roaming integrations with each other. It disadvantages smaller networks whose roaming integrations can get pushed into the future. We have found that automakers also take a similar approach and are selective about which networks to establish roaming integrations with for their OEM-branded EV networks.

From a driver perspective, this piecemeal approach to roaming disadvantages those drivers who may pull up to a network that does not have a roaming integration with one of their member networks, thereby adding another point of friction to the EV driver experience.

SWTCH supported California's AB 2697 because it strikes the appropriate balance of authorizing the CEC to establish roaming standards for major networks while still ensuring the networks retain flexibility as to whether they will establish bilateral (direct peer-to-peer) or hub-based (e.g. through an eMSP) integrations.

4. What challenges with roaming implementation merit additional discussion?

   SWTCH response: See above response to Question 3.

SWTCH appreciates the Commission's collaborative approach in inviting stakeholder input on these questions. Please reach out if I can answer questions or provide more information.

Sincerely,

Josh Cohen
VP, Policy