

Response to:

A California Energy Commission Staff Workshop on the State's Role in Supporting Interoperability for Electric Vehicle Supply Equipment (EVSE)

From:

EV Connect, Inc., a California-based provider of EV charging software and solutions

About EV Connect

With more than 1,500 EV charge stations deployed and an increasing number of workplace, commercial and government charge stations under management, EV Connect is one of the nationwide leaders in EV charging infrastructure.

Summary Position:

In its mandate to advance interoperability in the driver interest, EV Connect believes that the CEC would benefit by clarifying two important issues related to **1) EVSE network-to-network** interoperability that affects driver experience as it pertains to billing, locating EVSE, and availability of EVSE; and **2) hardware-to-network** interoperability that affects EVSE owners, to give them flexibility in choice of networks and/or hardware.

Our primary recommendation to the CEC to address network-to-network interoperability is to support one or more of the following solutions:

1. Accept and encourage the emerging recommendations from the NEMA working group of network interoperability.
2. Fund the creation of a common billing and data communication protocol between all networks to enable direct network-to-network communications to facilitate the sharing of proprietary driver, billing and device data, thus bypassing the need for a central clearinghouse altogether.
3. Fund the creation of an independent nonprofit clearinghouse to oversee driver-facing interoperability issues, thereby addressing EVSE network providers' concerns about unfair competition and access to proprietary data.
4. Fund the development of more than one EVSE network clearinghouse.

EV Connect's recommendation to the CEC to address the second interoperability issue of hardware-to-network, is to grant funds only to EVSE infrastructure providers who utilize Open Charge Point Protocol (OCPP) or provide network connectors that allow EVSE owners the ability to freely mix and match hardware and networks.

Exposition of Position

Network-to-Network Interoperability

As EV drivers, we at EV Connect know that:

1. **All** drivers want the freedom to use any public charge station.
2. **All** drivers want a simple means of locating charge stations, ascertaining their availability, and determining how much it will cost to charge.

Through our more than 4 years of experience in serving EV drivers, we have learned that many early adopting EV drivers do want the simplicity of a single credential to use charge stations on any network. EVSE network providers, however, are already providing mobile applications to enable access and billing without the use of key fobs. With the ability to have multiple EVSE applications on a mobile device, credential interoperability is less of an issue.

The logical solution to these driver concerns is the coordination between EVSE network providers to accomplish the following:

- Provide a unified data stream to locate and determine the status and pricing of charge stations
- Enable drivers to roam between EVSE networks
- Authenticate drivers in real-time
- Manage roaming transactions
- Unify reporting for the purposes of efficient billing

It has been suggested that one central clearinghouse should provide these capabilities. However, given the current immature stage of the market and the number of competitors in the space it is highly unlikely that consensus for, and integration with, a single clearinghouse will be achieved in the next 24 months – particularly if that clearinghouse is financially and technologically tied to, or owned by, a limited number of network providers.

In contrast, our recommendation to the CEC to address these interoperability issues is to support one or more of the following solutions:

1. Accept and encourage the emerging recommendations from the NEMA working group of network interoperability.
2. Fund the creation of a common billing and data communication protocol between all networks to enable direct network-to-network communications to facilitate the sharing of proprietary driver, billing and device data, thus bypassing the need for a central clearinghouse altogether.
3. Fund the creation of an independent nonprofit clearinghouse to oversee driver-facing interoperability issues, thereby addressing EVSE network providers' concerns about unfair competition and access to proprietary data.
4. Fund the development of more than one EVSE network clearinghouse.

Hardware-to-Network Interoperability

EV Connect’s recommendation to the CEC to address the interoperability issue of hardware-to-network, is to grant funds only to EVSE infrastructure providers who utilize Open Charge Point Protocol (OCPP) or provide network connectors that allow EVSE owners the ability to freely mix and match hardware and networks (see Figure 1 below).

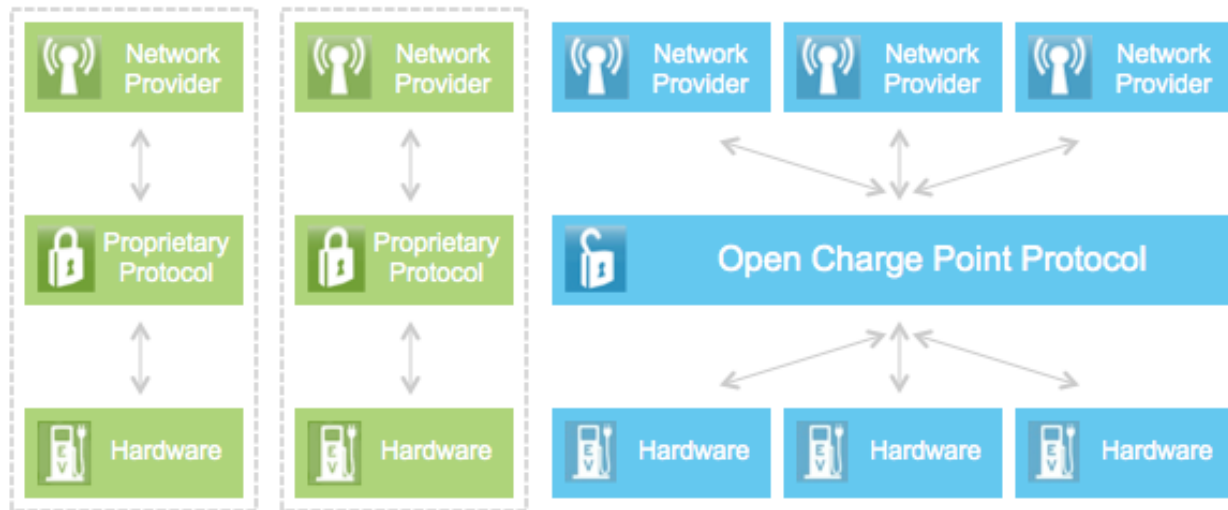


Figure 1. OCPP allows for hardware-to-network interoperability leading to choice, competition, and EVSE infrastructure expansion.

Giving EVSE customers that choice and flexibility to use any network on any charge station would, through market forces, encourage EVSE hardware and network providers to compete on price, service, product features, and innovation – all of which encourages demand by charge station owners. The end result is a significant benefit of the state’s EV drivers as EVSE infrastructure expands.

Responses to Specific Questions

1. *What should be the State’s role in supporting industry efforts to develop interoperability standards for (i) PEV drivers to access charging stations and (ii) backend software management platforms to allow for various EVSE?*

(i) EV Connect’s recommendation to the State regarding its role in supporting industry efforts to develop driver access interoperability standards (network-to-network interoperability) is to back one of the following solutions:

1. Accept and encourage the emerging recommendations from the NEMA working group of network interoperability.
2. Fund the creation of a common billing and data communication protocol between all networks to enable direct network-to-network communications to facilitate the sharing of proprietary driver, billing and device data, thus bypassing the need for a central clearinghouse altogether.

3. Fund the creation of an independent nonprofit clearinghouse to oversee driver-facing interoperability issues, thereby addressing EVSE network providers' concerns about unfair competition and access to proprietary data.
4. Fund the development of more than one EVSE network clearinghouse.

(ii) EV Connect's recommendation to the State regarding its role in supporting industry efforts to develop interoperability standards for backend software management platforms is to grant funds only to EVSE infrastructure providers who utilize Open Charge Point Protocol (OCPP) or who provide network connectors that allow EVSE owners the ability to freely mix and match hardware and networks.

2. *What should be the State's priorities in the development of network interoperability—driver access, cost reduction or other priorities?*

The EVSE market is immature, fragmented, and evolving quickly. Hardware and network costs are being driven down naturally by market forces and there is no reason to expect that this will change in the foreseeable future.

With respect to both network-to-network driver interoperability and hardware-to-network interoperability, EV Connect recommends that the State's priority be to encourage competition and not financially or otherwise benefit a limited number of companies.

Supporting one of our four recommendations for network-to-network interoperability would benefit EV drivers through EVSE market competition without the State "picking a winner". As we have seen, some of the most well known EVSE manufacturers and networks are susceptible to bankruptcy. If the State supports programs that ultimately only benefit one or a small handful of EVSE companies, the State risks losing its EVSE investments and incentives.

To encourage the proliferation of EVSE infrastructure, the builders of that growth are the workplaces, commercial entities, and governmental organizations that purchase charge station hardware and networks. Demand to purchase and install charge stations is limited due to the perception that charge stations are a nice-to-have amenity and the fact that buying, installing, operating, and maintaining charge stations is expensive.

The State can let the market apply downward pressure on costs by encouraging open communication protocol standards between charge station manufacturers and network providers. Furthermore, EV Connect recommends that the State only fund EVSE companies that utilize OCPP, or at a minimum, provide open connectors into their network. Funding open protocols will increase the likelihood that the State's grant money will achieve its goals of benefiting EV drivers by increasing the number of available charge stations.

Those companies wishing to operate their proprietary, closed networks can be free to do so and the market will naturally evolve to the benefit of drivers and charge station owners.

3. *What are the advantages of ensuring that EVSE in California have hardware interoperability? Are there any disadvantages and if so what are they?*

Backing open hardware-to-network communication protocols (i.e., OCPP and open connectors) will ensure that charge station owners have the freedom to choose their hardware and network providers. Having that ability will drive costs down and increase the level of service and support for charge station owners. Customer choice and flexibility will also ensure that when EVSE companies go out of business, that the customer's EVSE assets will not be rendered useless and decrease EVSE infrastructure instead of growing it.

We do not see any disadvantages to true network-to-hardware interoperability using open communication protocols.

4. *What are the overlapping issues and relationships between network and hardware interoperability? Where do they intersect and what are the future implications of adopting network interoperability without hardware interoperability?*

As we have described earlier in this document, communication between networks to facilitate driver-facing benefits is unrelated to the communication between charge station hardware and networks.

Drivers will benefit from networks being able to communicate with other networks provided the network market be allowed to evolve without the State unfairly benefiting a small number of EVSE companies. While hardware-to-network open communication protocols benefit both charge station owners due to competition, and drivers due to infrastructure growth.

The implications of the State encouraging one form of interoperability without the other are minimal, except that we believe that priority be given to hardware-to-network open communication protocols. Doing so will benefit both drivers and charge station owners whose charge station purchases grow EVSE infrastructure. Moreover, alternatives exist for drivers to pay for EV charging, especially as network providers release mobile apps that can replace carrying multiple, bulky key fobs.

We believe that if you surveyed EV drivers you would find that they would prefer more convenient access to charge stations, rather than only having to carry one key fob or receive one bill for the limited number of charge stations that exist today.

5. *How can the Open Charge Point Protocol used in Europe serve as an example to California?*

Rather than merely use OCPP as an example or basis for developing a California or US-based standard, the State should require that all charge station network providers who receive any type of funding support OCPP as their communication standard, or at the very least provide open connectors to OCPP.

OCPD has proved effective in Europe and a number of US-based EVSE companies have already adopted it, including EV Connect.

6. *Should the State provide support for these interoperability business models [Collaboratev and Greenlots SKY]? If so, why and what kind of support should it provide?*

Greenlots SKY is a charge station network product similar in function to Chargepoint and the Ecotality Blink Network. It was developed by Zeco Systems Pte Ltd, a software developer based in Singapore. Greenlots SKY is **not** an interoperability business model or standard but do they support Open Charge Point Protocol (OCPD).

With respect to Collaboratev, we believe that support should only be granted to interoperability business models that are not owned and/or operated by a limited number of EVSE network providers who stand to benefit disproportionately from critical State funds.

As discussed above, EV Connect believes that the State should support the development of interoperability models between networks and between charge station and networks, but should avoid making grants that “pick winners”. Rather, the State should fund solutions that encourage competition, spur innovation, reduce system costs, and increase customer service.

7. *What criteria should future EVSE solicitations require with regard to interoperability?*

Future solicitations should stipulate that:

- a. Any proposed network-to-network communication protocols or clearinghouses aimed at simplifying drivers’ EV charging experience should NOT be owned and/or operated by a limited number of EVSE network providers who stand to benefit disproportionately from critical State funds.
- b. Any EVSE company receiving State funds must utilize OCPD or provide open connectors to its communication protocol.

8. *What data should be made available to the public from state-funded EVSE?*

Standard usage information will include charging time, connected time, power consumption, and average system cost and price should be sufficient for the public, cleansed for specific driver data.

9. *What payment methods should be required for state-funded EVSE?*

We believe that the market will determine optimal payment options, but we expect that all charge stations will eventually support “Point of Charge” credit card billing through Paypal or another reputable merchant gateway provider.

We also believe charge stations should support the ability to charge by the hour, the session or by the power provided. Billing options beyond this are at the discretion of the network provider and may provide a means of differentiation.