

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**



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Order Instituting Rulemaking to Consider
Alternative-Fueled Vehicle Programs,
Tariffs, and Policies.

R.13-11-007
(Filed November 14, 2013)

eV2g LLC
REPLY COMMENTS ON ALTERNATIVE FUEL VEHICLES RULEMAKING

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May 31, 2016

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Order Instituting Rulemaking to Consider
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(Filed May 18, 2016)

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Pursuant to the Rules of Practice and Procedure of the California Public Utilities Commission (“Commission”) and in considerations of opening comments filed in this docket, which raise several important points have not to date been addressed, eV2g LLC (a joint venture of NRG Energy and the University of Delaware, as defined in our original comment of 18 May 2016, hereby submits the following reply comments.

**I. POTENTIAL DISCRETION OF THE COMMISSION IN SPECIFYING
STANDARDS FOR INTEROPERABILITY**

In opening comments, eV2g suggested that the Commission consider allowing SAE J3072 as an interconnect standard in Rule 21 in substitution for UL, among others:

The simplest pathway would be for Rule 21 to allow testing to any of UL 1741, SAE J3072, or IEEE 1547.1. All these provide equal levels of electrical safety and power qualify. Automakers might then demonstrate SAE J3072 compliance as part of the manufacturing process.

In relation to this prior comment, we note here the State of California, PU Code 8326 (a) allows that the Commission consider standards for interoperability from multiple public/private organizations. Thus, the existing statute would seem to already give authority to the Commission to consider a standard such as SAE J3072 for evaluation of interconnection. Our

recommendation would be that the Commission explicitly indicate that for interconnection, SAE J3072 be identified as being sufficient and on equal par with UL 1741 for interconnection of EVs.

II. SUITABILITY OF EXISTING STANDARDS FOR COMMUNICATION BETWEEN ELECTRIC VEHICLE AND CHARGING STATION

Some commenters feel that the CHAdeMO standard for communication between Electric Vehicle (EV) and charging station can be used for the provision of grid services. However, the CHAdeMO standard provides no way for the EV to uniquely identify itself to the charging station. Nor does it provide any way for the EV to notify the charging station as to the amount of energy in kWh available from the battery. It only can communicate this in percentage of the maximum amount.

The identification of the car, for example using a Vehicle Identification Number (VIN) that includes both type information and individual vehicle serialization, is essential in a situation in which the car is providing grid services for several reasons:

1. A type of car becomes part of the interconnected equipment being certified and thus that type may require certification;
2. The individual car has an individual owner who may choose to participate or not participate in providing grid services. Without a VIN or any other identification, the charging station makes a decision as to whether or not the EV should participate independently of that EV having permission to do so.
3. If state, company, or utility policy is to enumerate the EV owner for part of the value produced by grid services, the lack of VIN or other individual vehicle identification

makes it difficult and uncertain to confirm what party should be compensated for grid services.

The identification of the amount of energy in the EV battery in kWh is essential so that the charging station can determine the capacity of any power bid being made for the battery as an electrical resource. Percentage of a battery whose capacity will change through time is inadequate as a measure of the electrical quantify available and possible to bid.

Therefore, if CHAdeMO is proposed to be used for bidding power services, we feel it would be essential that the CHAdeMO standard be extended to:

1. Have the EV provide to the charging station an identifier of type and of unique serial number, such as a VIN; and
2. Provide from the EV to the charging station a measure of the electric energy allowed to be drawn from the battery in kWh.

Some commenters feel that the IEC15118 standard for communication between EV and charging station can be used for the provision of grid services. However, the IEC15118 under AC charging provides no way for the charging station to know the current capacity of the battery in kWh (see above). If the EV is to be used for both charging and discharging, the IEC15118 standard has no means of communicating information needed for V2G. Therefore, at least these capabilities would need to be added to either existing protocol to make them ready for consideration for such use.

III. ADEQUACY OF INDEPENDENT COMMUNICATION FROM EV AND CHARGING STATION

Some commenters consider that communication between car and charging station is not needed for provision of grid services, and that it is sufficient for the vehicle to communicate over

cellular data to one back office and the charging station to communicate over either wired or wireless communication to another back office. This proposal raises concerns including:

1. Generally this method causes uncertainty as to which charging station is being paired with what vehicle, information that must be generally correct for billing, and must be at least five 9's reliability to be correct for safety reasons.
2. Failing to meet safety standard for reliability of backfeeding, if the inverter is in the vehicle, there is no way to know what device is energizing the grid with sufficient reliability to meet grid codes. If the inverter is in the charging station, it cannot provide capacity estimates, as noted above.
3. Depending on jurisdiction, the grid operator may consider only the charging station to be registered. In such jurisdictions, the charging station must have a communication path that can be validated with regard to bid and performance for the grid operator.
4. Increasingly, grid services are requiring low latencies, with two seconds required for primary reserves in some areas already, and well under one second required in emerging markets in countries with high penetration of renewables. Cellular is not sufficient latency. Also, at a continuous one-second transmission rate, cellular charges can be greater than the payments for grid services. Therefore, in some jurisdictions, and possibly in California in the future, it may be necessary for the car to communicate with the charging station via a direct digital communication link, and the charging station in turn send via a low-latency direct internet signal.

We strongly recommend that the Commission not suggest that independent communication from EV and from charging station will be an adequate general solution. We also suggest that the commission not suggest that wireless communication will be sufficiently low latency, and of acceptable cost, to be a general solution.

We appreciate the Commission's time to review the comments provided.

Respectfully submitted,

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