VGI Working Group

October 27, 2017

Draft Proposal for Next Steps

Background:

The Working Group has completed substantial portions of Deliverable 1 in the Work Plan yielding the following observations:

1. As of October 2017, we cannot designate a single existing protocol that would be able to support all of the VGI use cases. The market is still developing, and combinations of protocols are necessary to provide end-to-end (i.e. grid to vehicle) communications to meet the majority of use case requirements.
2. IOU Investments should minimize the probability of stranded assets that cannot participate in current and future VGI opportunities:
    a. EVSE Hardware should be designed to enable field upgradeable software (e.g. over the air flashing).
    b. EVSE Hardware should be physically capable of handling all currently viable protocols, should the project host choose to implement them.
3. VGI-enabling hardware investments should be cost-effective and ensure long-term ratepayer benefits. At a minimum, this entails:
    a. Minimizing up-front investment.
    b. Maximizing potential for grid benefits.
4. One of the goals of the Working Group is to gather data and document analysis that will help support State Agency decision making regarding what policies we need to adopt to support VGI. The agencies have kept every standard and non-standard option on the table during the working group period. Given our finding that we cannot select a single protocol at this time, our suggested approach is to develop recommendations on hardware performance requirements that allow EVSEs to accommodate multiple protocols. This approach combines the flexibility to ensure future usability with the certainty that manufacturers need to invest in producing products.

Straw Proposal

Based on the Working Group results to date, the State Agencies (CPUC and ARB) have developed the following straw proposal to help guide further Working Group discussion to identify the necessary EVSE hardware functionality. The scope of this proposal is for multi user Level 2 EVSEs supported by SB 350 funds. The working group found that DC fast chargers are not likely to be utilized for VGI due to the need to provide maximum power while in use and that Level 1 or single user EVSEs are unlikely to have a

duty cycle that justifies the expense of enabling VGI in the EVSE hardware. This hardware proposal does not exclude the use of alternative paths of communication (e.g. telematics)

	Hardware Functionality /Physical Layer	Description	Documentation to Show Compliance
Northbound (Grid to EVSE) communications	IEEE 802.11n compliant hardware, IEEE 802.3 compliant hardware	Wifi and ethernet connection	TBD
EVSE Performance requirements	Field upgradable, Sufficient processor power to perform real time protocol translation and encryption/decryption, supporting IP stack, interface that provides hardware extensibility, form factor that supports extensibility	Need input from working group on what physical layer/hardware specifications accomplish this specification (e.g. USB, Bluetooth, CEA-2045)	TBD
Southbound (EVSE to EV) communications	Homeplug Green PHY	The physical layers that support the currently viable protocols	TBD

We have identified northbound (between the EVSE and the grid) and southbound (between the EVSE and EV) requirements. There is still opportunity for growth in each area and we understand that one cannot enable VGI without the other. The north bound requirements are important because the agencies would like to not see stranded assets. Ideally the IP and flash capabilities would allow for companies to push an over the air update when the time was right to each of the stations when market forces dictate the change. The southbound requirements will allow for VGI service functionality.

The Working Group should determine what kind of documentation is necessary to show that an EVSE meets the required hardware functionality. This will allow the IOUs a clear and streamlined process for

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ensuring that any EVSE they support with ratepayer funding contains this functionality. Documentation could include certifications, parts list, or an item data sheet.

Next Steps:

During the October 30 Webex, State Agencies will review this proposal for stakeholder feedback. Participants will also identify any challenges to this new proposed approach. Based on feedback, the State Agencies will consult with their management and develop a revised Work Plan that describes a new goal and process for Deliverable 2. The State Agencies propose to use the in-person November 14 Working Group meeting to further develop the next deliverables.