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Stakeholder feedback to inform development of Flexible Demand Appliance Standard (FDAS)

Describe your equipment:
Level 2 EVSE, whole home energy monitoring equipment.

What is the current landscape of options for charging schedules that prioritize the driver experience, emissions reductions, financial savings, and/or other factors?

In increasing complexity:
- unmanaged charging, the EV is an appliance;
- managed charging, EV charged based on TOU profiles or tariff (peak charging rates);
- interactive, smart V2G operation as a fully integrated, and dispatched DER

3. Please comment on the various EVs or EVSE consumer charging preferences such as charge immediately or â€œcharge by departureâ€□,

a. How does using charge strategy balance factors as battery life,
- EV manufacturers need to specify conditions under which the battery will stay within a 100k-mile warranty. This should satisfy customers while allowing sufficient flexibility to allow an EV to be operated as a dispatched DER.

b. What consumer data is available that provides customer charging habits such as: demographics and population percentages that prefer to charge at home, at work, or in public shared spaces? What times of day? - As reported by Brattle; 80% of EV charging is done at home.

c. What charger types are typically used?
- Level 1 and Level 2. One expects a household that can afford an EV can also afford a Level 2 charger. So, â€œtypicalâ€□ is most likely a Level 2. All commercial chargers (e.g., ChargePoint stations) are at least Level 2.

d. How do charging patterns change as EV owners gain experience with their vehicle?
- No data/response

e. What percentage of battery capacity is typically charged per session?
- No data/response

f. How is this behavior expected to change as ownership of EVs expands beyond the early adopters?
- No dramatic change is expected.

4. When will DC charging equipment be available for residential installation?
- No data/response

5. What software and hardware capabilities could enable public EVSEs to relieve/eliminate grid congestion at the Distribution (referring to Transmission and Distribution, T&D, for the grid) level?
- Fully inter-operative communication channels need to be implemented from EV â†' DSO and back. All the parameters and capabilities are being structured into the approval process for an EVSE/inverter approved to UL 1741/SB and 1741/SC.

6. Similarly, what software and hardware capabilities are best suited enable residential EVSEs to relieve grid congestion at the Distribution level?
- Same answer as #5.

What hardware and software are needed on the EVâ€™s Onboard Charging System to enable load shifting?
- Same answer as #5.

What percentage of EVs currently receive grid signals (e.g., electricity prices, GHG emissions and California Independent System Operator Flex Alerts) to schedule load shifting, demand response, and/or bi-directional charging?
- No response.

What percentage of EVs require the EVSE to receive grid signals to schedule load shifting, demand response, and/or bi-directional charging?
- No data/response

What are the most common methods for communicating signals to EVSEs and EVs (e.g. Ethernet, Wi-Fi, Cellular, AM/FM broadcast)?
- Emporiaâ€™s EVSE equipment is configured to use WiFi as primary.

8. Is the EV telematics system used to receive grid signals (e.g., electricity prices, GHG emissions, and California Independent System Operator Flex Alerts) and schedule charging in response to those grid signals? - Not that weâ€™re aware of, but the capabilities and protocols are in place, or will be soon.

9. How can medium-duty and heavy-duty (MDHD) EVs and their EVSE fit into the CECâ€™s goal of load shifting to avoid GHG emissions?
- No data/response

10. Should the scope of this regulation include load shifting criteria for EVs such as forklifts, boats, and other off-road vehicles?
- No data/response

11. There are currently some buses that use wireless charging to top off batteries at bus stops. What are other applicable uses for wireless charging.

- Wireless charging is not on Emporiaâ€™s product road map.

12. What are the charging practices for commercial fleets? Bus fleets? Overnight depot level charging?
- No data/response

13. Which communication protocols or components of existing communication protocols are used to enable load shifting capabilities for EVs and EVSE?
- ISO 15118-2 and/or ISO 15118-20 are designed to manage this. Sunspec says itâ€™s ModBus protocol will have this capability.

14. Does data exist on the effect of bidirectional charging on EV battery life? How is battery capacity affected by the frequency and level of bidirectional charging (for example, power level, total energy discharge, and so on)? - No data/response

15. Can a load shift program work with EVSEs/EVs responding to generic signals, or must signals be tailored for each EVSE/EV?
- In theory, the EV should state a time/discharge profile to EVSE and other listeners (e.g., SOC > 10%, and equal to 90+% by 7AM), but this is not enabled as far as weâ€™re aware.

16. What data or information is needed from the EV and/or EVSE to enable load shift while ensuring driver mobility and range needs are not compromised (for example, kWh needed by the vehicle)? How could this data or information be communicated across all vehicle and supply equipment models, regardless of the manufacturersâ€™ involvement?
- Same answer as #15.

17. What is the energy consumption impact from adding flexible demand capability to existing EVSE?
- Question isnâ€™t clear; residential energy, substation energy, or EV energy?

18. Please discuss strategies for EVSE to best utilize the CECâ€™s Market Informed Demand Automation Server (MIDAS) which provides access to utilitiesâ€™ time-varying rates, GHG emission signals, and California Independent System Operator (California ISO) Flex Alerts?
- See answers to #5 and #15.

19. What are the cybersecurity challenges and needs associated with communicating signals from the grid, or a third-party, to accomplish supplying energy to electric vehicles?
- Hard to foresee; main worry at this point is a userâ€™s home network(s) being compromised.

20. Are there any considerations to ensure equity when developing a load shifting

strategy for supplying energy to electric vehicles?
- No data/response.