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# Ford Comments on Flexible Demand Appliance Standards RFI

*Additional submitted attachment is included below.*

**World Headquarters**
**One American Road**
**Dearborn, Michigan 48126**

December 20, 2024

**Efficiency Division, Load Flexibility Branch**
**California Energy Commission**
**715 P Street Sacramento, CA 95814**

**RE: California Energy Commission Request for Information (RFI) on Flexible Demand and Load Shifting in California for Electric Vehicle Support Equipment**

Ford Motor Company (Ford) thanks the staff and leadership at the California Energy Commission (CEC) for considering these comments. The ability to load shift has become increasingly critical to better manage the load growth created through an electrified transportation sector. Ford has seen this be an especially salient solution for commercial fleet vehicles to overcome grid constraints for charging installations.

Electric vehicles and software-defined vehicles will play an increasingly important role in our future. Throughout this transition, Ford will succeed through relentless focus on our customers. We are transforming customer experiences by developing and delivering high-value, software-enabled services that help address some of our customers' greatest challenges. We are focused on the experiences around buying, driving, securing, servicing, and charging a Ford vehicle to build a simple, transparent and always-on relationship with the customer.

Ford is committed to addressing the charging infrastructure challenges for the success of the EV transition. In addition to providing the BlueOval™ Charge Network for convenient public charging, Ford Pro and Ford Pro Charging provide the hardware and software to ensure private fleet customers have reliable infrastructure to power their growing EV fleets.

We support the Commission's efforts with this RFI to solidify flexible standards that facilitate load shifting operation. We want to emphasize that need for flexibility as the market develops in scope and scale, while still maintaining ecosystem communication capability.

In the attachment to this letter, Ford provides answers to specific questions for which the Administration is seeking comment. Thank you again for your time and consideration. Please feel free to contact me or Jeanette Clute, Electrification, Charging and Energy Services Policy Manager at jclute@ford.com if Ford can provide any additional information or support.

Sincerely,

Cynthia Williams

Cynthia Williams

1. **Please provide information to assist the CEC in determining whether the scope of devices in**

**Table 1: Examples of In and Out-of-Scope Electric Vehicle Supply Equipment**

| Potential In-Scope Devices | Potential Out-of-Scope Devices |
|---|---|
| ▪Level 1 Electric Vehicle Supply Equipment<br>▪Level 2 Electric Vehicle Supply Equipment<br>▪DC-output Electric Vehicle Supply Equipment<br>▪Wireless Electric Vehicle Supply Equipment<br>▪Medium voltage AC input supply Electric Vehicle Supply Equipment<br>▪Power electronic components inside the vehicle | ▪Pantograph Electric Vehicle Supply Equipment<br>▪Equipment with an automated connection system |

Source: California Energy Commission

2. **What is the current landscape of options for charging schedules that prioritize the driver experience, emissions reductions, financial savings, and/or other factors? Please provide information or data on customer receptiveness to various charging schedules, such as charge immediately, charge by departure, etc. and the entity who possesses such information.**

   Ford connected vehicles work to balance many factors when optimizing the home or fleet charging experience for customers. Customer uptime will nearly always be the priority, especially in the case of commercial vehicle customers. Downtime due to incorrectly applied charge schedules would cause revenue loss for commercial customers and potential mobility loss for retail customers. Financial savings is second, but not at the cost of mobility. Customers have the option to opt in or opt out of demand response events for that very reason, but we see low rates of opt-out when enrolled in a managed charging program. Schedules are optimized by our aggregators, like ChargeScape, a new automaker joint-venture and global vehicle-grid integration platform. Customers with access to more than one time of use rate can shape their schedule through their choice of rate.

3. **Please comment on the various EVs or EVSE consumer charging preferences such as charge immediately or "charge by departure", where the EV is charged to a specified percentage with a set time to be ready.**
   a. **How does using charge strategy balance factors as battery life, price, etc.?**
   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?**
   c. **What charger types are typically used?**
   d. **How do charging patterns change as EV owners gain experience with their vehicle?**
   e. **What percentage of battery capacity is typically charged per session?**

f. **How is this behavior expected to change as ownership of EVs expands beyond the early adopters?**

4. **When will DC charging equipment be available for residential installation? What are the expected use cases, penetration, price range and power level of DC equipment used in the residential sector? Would certain DC chargers installed at private residences require a Battery Energy Storage System to manage peak load?**

   Residential locations area heavily capacity constrained and we don't anticipate DC charging equipment being prevalent for home charging.

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? What control strategies are available to the grid operator and/or load aggregator to shift and/or curtail demand from EVSEs at the Distribution level to maintain grid reliability?**

   Ford Motor Company primarily operates fleet EVSEs, which are typically private but can operate in a hybrid public/private model through its Ford Pro Charging business. Ford Pro Charging is working towards automated load management solutions from both the hardware and software side to relive grid congestion. These solutions can allow fleet operators to "oversubscribe" a distribution point while waiting for grid upgrades or provide a more permanent program that offers compensation mechanisms for reduced load availability.

   On the retail side Ford participates in a variety of aggregated managed charging program offerings in which vehicles respond to demand response signals from the utility or follow set schedules. In addition, Ford is working towards more bidirectional capabilities that can further reduce home electricity demand or inject power back to the grid at highest peak times. In all scenarios customers are voluntarily participating in load reduction or shifting programs and should be compensated fairly for their service. The control strategies are maintained by the aggregator with input from utilities.

6. **Similarly, what software and hardware capabilities are best suited enable residential EVSEs to relieve grid congestion at the Distribution level? What control strategies can be deployed by the grid operator and/or load aggregator to shift and/or curtail demand from residential EVSEs at the Distribution level support grid reliability?**

   We have seen demand response signals be effective in curtailing demand during high stress times and believe that a future with more dynamic price signals being sent by distribution utilities will be an effective solution. The capabilities to incorporate these dynamic price signals is still in the early stages but can more effectively compensate customers, especially those with bidirectional capabilities, to participate in load shifting. Customers participating in any load shift or demand curtailment are motivated by financial benefit, so without enticing price signals there will be no participation by customer-owned assets.

7. **What hardware and software are needed on the EV's Onboard Charging System to enable load shifting? 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 bidirectional charging? What percentage of EVs require the EVSE to receive grid signals to schedule load shifting, demand response, and/or bi-directional charging? What are the most common methods for communicating signals to EVSEs and EVs (e.g. Ethernet, Wi-Fi, Cellular, AM/FM broadcast)?**

100% of current production electric vehicles can receive signals via the OEM cloud, but responding to signals requires additional opt-in and infrastructure to connect to those signals between the OEM and customer.

8. **(Focused on EV manufacturers) 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? If so, what is the monthly cost charged to the customer for these capabilities?**

   We have received electricity price signals through EV telematics and demonstrated capability to respond. So far, that capability has not been tested with GHG emissions or flex alerts, but we have every reason to believe EV telematics are capable with those signals as well.

9. **How can medium-duty and heavy-duty (MDHD) EVs and their EVSE fit into the CEC's goal of load shifting to avoid GHG emissions?**
10. **Should the scope of this regulation include load shifting criteria for EVs such as forklifts, boats, and other off-road vehicles? Do off-road vehicles typically have a defined use-cycle that fits the need for load shifting? If so, which types of offroad vehicles? Please provide off-road EV counts, types of EVSE for off-road EVs, and charging strategies for off-road EVs.**
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, and is wireless charging planned in your product roadmap? If so, when is wireless charging expected to be more widely available?**
12. **What are the charging practices for commercial fleets? Bus fleets? Overnight depot level charging? What power levels? How is the charging of the fleet managed? Manually rotated? Management software?**

    In our experience fleets all operate differently, and solutions are not one size fits all. Charging patterns among fleets vary widely, so charging patterns contain options for fleets for either equal distribution or targeting vehicles with the lowest state of charge. These charging patterns are managed automatically through software and sophistication is expanding.

    Generally, fleet depots have longer dwell times and higher usage than other commercial charging configurations and for our customers 19kW chargers are the most common.

13. **Which communication protocols or components of existing communication protocols are used to enable load shifting capabilities for EVs and EVSE? What is the implementation status of these communication protocols? Are industry-wide standard communications and control protocols currently in use or planned? Are there remaining gaps to enabling load shifting capabilities?**

Communication between utilities and aggregators relies mainly on standardized protocols, while much of the communication between the OEM cloud to chargers and vehicles is proprietary. This is generally a standard practice to ensure uptime and performance among the OEM ecosystem, while still allowing standard communication interface with utilities.

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)? Does this affect the warranties or insurance of the EV owner? If so, can the loss in value, if any, be quantified over the life of the battery?**

    We stand behind our warranties and that does not change with bidirectional operation.

15. **Can a load shift program work with EVSEs/EVs responding to generic signals, or must signals be tailored for each EVSE/EV?**

    As mentioned above in question 13, we see generic signals being handled primarily by our aggregator of choice. This is the value Ford has demonstrated already through the Open Vehicle Grid Integration Platform in previous load shift pilots and programs, which will expand with the launch of ChargeScape.

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 manufacturers' involvement?**

    Ford's business model ensures the highest level of data privacy and security, so it only allows Ford-authorized aggregators access to EV data and smart charging functionality as consented by customers.

17. **What is the energy consumption impact from adding flexible demand capability to existing EVSE?**

    EnergyStar certification is a priority for Ford EVSE products and load shifting is initiated from the cloud level rather than the EVSE.

18. **Please discuss strategies for EVSE to best utilize the CEC's Market Informed Demand Automation Server (MIDAS) which provides access to utilities' time varying rates, GHG emission signals, and California Independent System Operator (California ISO) Flex Alerts? More detail can be found here: Market Informed Demand Automation Server (MIDAS) (ca.gov).**

    Ford has not yet utilized MIDAS, but we encourage continued availability and access of this data from utilities.

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?**

Ford strives to be the most trusted company and we are constantly working to provide the highest level of data security for our customers. Cybersecurity is a top priority in all aspects of owning a vehicle, and charging communication signals are no different.

20. **Are there any considerations to ensure equity when developing a load shifting strategy for supplying energy to electric vehicles? For example, are there concerns that flexible demand will be disproportionately accessible based on income level?**

    It should be everyone's goal to lower the barrier to entry for participation in load shifting for electric vehicles. We encourage incentive programs to prioritize smart chargers and extra adders for bidirectionally-enabled systems as these technologies are often more expensive to manufacture than "dumb chargers" without connection to a broader ecosystem. The additional costs have a possibility to recoup for both the utility and customer over time, but the initial investment can be a significant barrier.

    We do see a need to better promulgate load shifting incentive programs to used vehicle purchasers. Ford has a robust dealer network that highlights charger incentive opportunities where available, but when customers buy from a third party on the used market the same information may not be clear. Some incentive programs for smart infrastructure are based on the purchase of a vehicle, so there is a urgency to get information to used vehicle purchasers quickly.