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Tesla Motors' Comments on Order Instituting Rulemaking to Consider Alternative-Fueled Vehicle Tariffs, Infrastructure and Policies to Support California's Greenhouse Gas Emissions Reductions Goal

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TESLA MOTORS CORPORATION
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In the initial public documents regarding Rulemaking 09-08-009, CPUC posed the following questions for all interested parties to address in comments filed in the proceeding. CPUC also invited parties to identify additional issues that the Commission should consider in the rulemaking. Tesla Motors would like to make the following initial comments in regards to the proposed rulemaking. As requested, the comments are noted with the line item numbers provided by the initial CPUC public documents.

Residential Charging Infrastructure and Policy

1. What types of residential metering arrangements are appropriate for PHEVs and BEVs and why? Should the Commission require a particular metering arrangement, or should it allow more flexibility in metering arrangements by investor-owned utilities or others? If so, why?

We recommend that all PHEV and BEV metering arrangements enable intelligent metering of electric vehicle charging and time of day charging. Residential metering arrangements should enable utilities to positively prove that electricity has been provided to a PHEV or BEV (as opposed to other electrical appliances like lawn equipment or home appliances) so that Low Carbon Fuel Standard credits or Carbon Credits (both to be determined) can be calculated and traded to more carbon intensive transportation applications, such as petroleum fuel refineries.

The Commission should therefore allow flexibility in metering arrangements, but only within a few constraints. Paramount among these constraints are the three mentioned below:

1. Ability to detect and report when electricity is being consumed for the charging a PHEV or BEV in a standardized format
2. Ability to track this electricity consumed by time of day
3. Ability for the grid to draw power from the vehicle, if needed, and for corresponding metering

2. How will electric vehicle meters or sub-meters and EVSE's interact with the advanced meters currently being installed across the service territories of investor-owned utilities? What policies does the Commission need to consider concerning any such interaction?

No comment at this time.

3. What kinds of equipment and electrical improvements will typically be needed to support residential charging for PHEVs and BEVs, e.g., EVSE's, metering, electrical system upgrades? Who should pay for residential equipment and improvements required to support PHEVs and BEVs, and why?

Given that electric vehicles are a more CO2-efficient means of transportation than internal combustion engines, we believe that electric vehicle charging infrastructure will provide a source of revenue for utilities as they will soon be able to monetize Low Carbon Fuel Standard credits or carbon credits generated by charging alternative vehicles. Therefore, we believe that the utilities are the most likely investor in additional electrical infrastructure and improvements required to add charging stations in residential areas.

One specific improvement that will need to be considered in certain areas likely to have the highest concentration of EVs is upgraded transformers (or a discrete transformer for vehicle charging) that would allow large current to be drawn from the grid without a disruption in service.

4. What policies should the Commission adopt to encourage competition and innovation in the market for residential infrastructure development for PHEV and BEVs?

The Commission should encourage customers of infrastructure to issue Requests for Quotes in an open bid process requiring standardized equipment that does not require a long-term contract to a specific vendor. In this manner, vendors will be forced to continuously compete to improve quality and lower cost. We strongly recommend that all infrastructure providers move toward universal

standardization to ensure that all Level I, II, and III charging infrastructure is compatible with every PHEV and BEV on the market.

5. Should the Commission consider allowing utilities to invest in and rate-base residential electric vehicle charging in order to encourage and support early adoption of PHEVs and BEVs? If so, what components of the infrastructure should the utility be authorized to invest in, e.g., wiring upgrades, EVSE? Should utility investment continue once the market matures? What impact might this have on the competitive marketplace relating to electric vehicle charging infrastructure by non-utility entities?26

We believe the Commission should encourage investment and improvement of all infrastructure in the electric vehicle charging value chain, including consideration of allowing utilities to rate-base vehicle charging. The Commission should encourage competition from private vendors to encourage continuous innovation and cost improvement as the market matures. We do not recommend that the Commission encourages the selection of a single vendor solution. In the early stage of the electric vehicle revolution, standards and technology will improve rapidly, and the Commission should encourage continuous evaluation of all available vendors and charging technology.

6. If a utility proposes to own customer-premises EVSE's, how will the Commission ensure that near-term EVSE and metering capital investments are interoperable with future generations of PHEV and BEV technology? 27

The commission should encourage PHEV and BEV manufacturers to develop vehicles that can recognize and adapt to any charging infrastructure that uses SAE standard connectors. As new EVSE equipment is introduced, standard connectors will ensure backward compatibility.

7. What approaches are there to provide PHEV and BEV charging for owners who do not have regular access to a garage for residential recharging (including single family dwellings and multiple dwelling

units (MDUs) like apartments, condominiums, and duplexes)? What regulatory issues does the Commission need to address relative to infrastructure for such residents?

The Commission should encourage the installation of public, all weather charging infrastructure that provides both Level I and Level II supply. This charging infrastructure could provide free of charge supply during off-peak times (night) and credit-card billing for peak time charging. We envision charging stations using billing hardware similar to public parking billing machines.

Also, many MDUs have parking garages for residents that serve as a strong opportunity for charging infrastructure because of the high density of parked cars. An approach to installing the proper infrastructure in these situations would involve collaboration with the utility and the owner/developer to provide the necessary equipment and specialized electricity service designed around charging PHEVs and BEVs.

8. How can the Commission, in coordination with utilities, relevant state agencies, federal authorities, local governments, and other entities, streamline EVSE permitting, installation, and approval processes from the time of PHEV and BEV purchase to EVSE activation? What jurisdictional barriers should be assessed to achieve a streamlined permitting, installation, and activation process for residential EVSE?

No comment at this time.

Commercial and Public Charging Infrastructure and Policy

9. How should electricity used for PHEVs and BEVs be metered at commercial and public charging facilities?

See response to comment #1.

10. Who should pay for commercial and public meters, EVSE, and related upgrades?

See response to comment #3.

11. How should the Commission ensure that commercial and public charging facilities are cost-effective, openly-accessible, and interoperable with a Smart Grid system?28

The Commission should encourage charging vendors to develop a standardization system for hardware and software that enables interoperable infrastructure and continuous technology improvement.

12. Are additional building codes needed for residential, commercial and public charging facilities to supply sufficient electrical services to PHEVs and BEVs? What role, if any, can the Commission play in this regard?

No comment at this time.

13. What policies should the Commission adopt to facilitate competition and innovation in the commercial and public infrastructure market?

See response to comment #4.

14. What issues need to be addressed related to the relationship between regulated electricity utilities and third-party electric vehicle service providers that are proposing and/or implementing charging services at residential, commercial and public locations?

No comment at this time.

Legal Issues Related to the Ownership and Operation of Charging Infrastructure

15. Under what circumstances are third-party electric vehicle service providers public utilities and/or electrical corporations pursuant to Pub. Util. Code § 216 and Pub. Util. Code § 218? What implications do Pub. Util. Code § 216 and Pub. Util. Code § 218 have on the competitiveness of the third-party electric vehicle service provider market? If the Commission has jurisdiction over third-party electric vehicle service providers, what is the appropriate level of regulatory oversight?

No comment at this time.

16. What statutory changes, if any, should the Commission propose to the legislature to encourage innovation and competition in the charging infrastructure market?

See comment #4.

Codes and Standards

17. Please identify current and pending Society of Automotive Engineers vehicle design and interface technical requirements, the Underwriters Laboratory listed components and systems, and the National Electric Code, California Electric Code, and California Building Code Regulations that govern the installation, operation, and maintenance of charging infrastructure at the residential, commercial, and public charging EVSE. How does the timeframe for each code and standard adoption impact current and future vehicle and EVSE products? What role, if any, can the Commission play in improving or encouraging this process?

The Commission should not encourage the purchase of any non-standard equipment. The charging providers should have a strong incentive to complete the standards for Level I, II, and III (DC) in that their products should not receive large scale purchases until a standard solution is completed. The Commission should be hesitant to encourage large purchases of any equipment that is not part of a universal standard usable by all PHEV and BEV customers.

18. How important is consumer choice as to Charging Levels ((Level 1, 2 or DC)? If important, how may the Commission best balance driver and grid benefits for all residential, commercial, and public charging infrastructure?

The Commission should encourage the installation of Level I, II, and III (DC) charging equipment based on usage profiles of customers. In urban areas, Level I and II may be sufficient. In suburban and inter-urban travel corridors, Level II and III will allow greater utilization of PHEVs and BEVs. In general, public stations should at a minimum provide Level II charging, in addition to Level I for electric bikes, scooters, and PHEVs with small battery packs. As battery costs improve, BEV range will increase, along with the need for faster charging. The Commission should be highly cautious of Level I-only installations, as these investments will be obsolete as battery costs decrease and battery pack energy capacity per vehicle increases. In the near future, battery pack energy capacity will affordably increase such that users will charge less frequently, but in greater amounts of energy per charge.

19. What role can the Commission play to ensure EVSE compatibility with a unified EVSE conductive charge coupler standard (J1772) for all residential, commercial, and public charging EVSE within regulated utility service territories? What role can the Commission play to ensure that EVSE be forward-compatible with emerging Society of Automotive Engineers loads, messages, and programs communication standards (J2293, J2836, and J2847)?

See comment #17.

Electrical System Impacts

20. What are the potential electrical distribution system impacts associated with geographically concentrated PHEV and BEV charging in the near-term? How will utilities anticipate these impacts and make capital investments needed to ensure service network reliability? How should the utility capital investments be paid for and recovered?

If properly implemented, the California Low Carbon Fuel Standard will enable utilities to bank carbon credits obtained during BEV charging, and then trade these credits for revenue to petroleum refineries. We believe BEV charging investments in California will be a profitable investment for utilities. The Commission should work closely with the California Air Resources Board to aggressively implement the California Low Carbon Fuel Standard and execute a cap and trade system for transportation-related CO2 emissions.

21. What commercial and public infrastructure options are most likely to be deployed, e.g., Level 1 charging facilities, Level 2 charging facilities, "service station" model DC charging facilities, and/or battery swap stations? Should the Commission adopt policies to favor certain charging options taking into consideration cost-effectiveness, grid benefits, ability to meet PHEV and BEV driver charging demand, and ability to reduce BEV driver "range anxiety"?29

Level II and Level III (DC) charging are the best long-term investments for the utilities. As hardware is standardized, Level II and Level III charging stations will be useful to all PHEV and BEV customers. Level I-only infrastructure will only be useful to micro-cars, e-bikes, e-motorcycles, and PHEVs with very small battery packs.

22. What potential load shape impacts associated with PHEV and BEV charging should utilities anticipate in the near-term? How can time variant pricing, demand response programs, and advanced meters mitigate load spikes associated with uncontrolled, simultaneous charging found to occur at specific times of day, for example, when drivers arrive home from work? How should the Commission address potential load spikes if a large number of customers begin charging simultaneously when lower electricity rates apply under TOU rate schedules?

The Commission should adopt variable time of day pricing. We believe BEVs offer the best environmental and cost benefits when charged at off-peak times, specifically when drivers are typically at home at night.

23. In the long term, what are the benefits and drawbacks on electric generation and transmission associated with projected PHEV and BEV market growth in California?

BEVs could smooth the load on the grid, as they utilize energy from the grid at night, possibly enabling better asset utilization of certain renewable sources like wind farms. By using off-peak generation to recharge vehicles, as well as enabling the grid to draw from vehicles that are plugged in during the day, utilities will be able to fully utilize base generation capacity and avoid the costly and environmentally unsafe "peak" generation that utilities currently use to meet current demand.

Tariff-related

24. Should the Commission authorize a default time variant electric vehicle rate applicable to all residential electric vehicle tariff customers? What changes, if any, to the rate protection provisions of AB-1X30 are needed to authorize a default time variant electric vehicle rate applicable to residential customers?

The Commission should authorize variable time of day pricing for EV charging to lower the cost of ownership for BEV drivers and smooth the demand on the grid.

25. What rates should apply to customers charging their PHEVs or BEVs at commercial, industrial, and public charging facilities that are in the same service territory as their home utility?

No comment at this time.

26. What rates should apply to third-party operators of commercial charging facilities? Should the Commission establish new rates for commercial charging facilities taking into account the costs and benefits created by these entities?

No comment at this time.

27. How should a customer pay when charging a PHEV or BEV in another utility's service territory? Please evaluate options set forth below, or suggest alternative approaches:

a. A customer pays a posted price for electricity to a specific electric charging provider at the time of the transaction, similar to how gasoline is purchased.

b. The second utility bills the customer's home utility and the home utility adds the electric vehicle electricity cost to the customers' energy bill. A third-party clearing house could facilitate these transactions.

d. A customer has a relationship with a third party charging provider and pays that third party wherever the customer charges.

e. A customer has a choice of all or some of the above options.

No comment at this time.

28. What types of costs and benefits are generated by electric vehicle adoption on different aspects of the electricity system, including transmission, distribution and procurement costs?

No comment at this time.

29. Should the electric vehicle rate structure be designed to align rates with the system costs and benefits of PHEVs and BEVs, and if so, how? Should the Commission assign additional costs and benefits attributable to PHEVs and BEVs to specified electric vehicle rate classes or socialize the costs and benefits attributable to PHEVs and BEVs to all customer classes? Should the PHEV and BEV rate classes bear existing rate component costs?

The electric vehicle rate structure should address the current tiered pricing that is adversely affecting electric vehicle drivers. Currently, California is pricing electricity on a tiered system that can result in charges of over $0.40 per kWh if a consumer is using a great deal of electricity.

The Commission should work to eliminate the tiered pricing structure for PHEV and BEV owners, and instead offer discounted rates for charging at off-peak times, as discussed above.

30. Should the electric vehicle rates reflect the marginal cost of service, particularly for off-peak electricity charging and, if so, how?

No comment at this time.

31. Should rate incentives be created for electric vehicles to be paired with distributed generation incentive programs, such as the California Solar Initiative (CSI) and Self-Generation Incentive Program? Should rate incentives be created for electric vehicles to be paired with demand response programs? How should these incentive programs be incorporated into electric vehicle rate structures? Who should pay for such incentives?

No comment at this time.

32. Under what circumstances can utilities and third parties aggregate PHEV and BEV services to participate in California Independent System Operator (CAISO) ancillary service markets? What policies, if any, does the Commission need to consider in this regard?

No comment at this time.

Low Carbon Fuel Standard

33. What recommendations, if any, should the Commission make to the California Air Resources Board regarding the treatment of electricity under the Low Carbon Fuel Standard? 31

The Commission should work closely with the California Air Resources Board to determine and standardize the carbon profile of BEVs relative to conventional vehicles, so that utilities can predict the cap and trade revenue available through BEV charging.

34. If a utility generates and sells credits under the Low Carbon Fuel Standard regulation due to customers' use of electricity as a transportation fuel, what should the utilities do with the revenue from the credits?

The revenue should off-set the fixed and variable costs of providing BEV charging. Any profit after these costs are considered should be offered to BEV consumers in the form of reduced cost of electricity or a State incentive program to offset the upfront cost of purchasing or leasing a BEV.

Programs and Incentives

35. Should utilities and/or government provide low-interest finance incentive programs for residential and commercial EVSE? Should these programs incorporate tax incentives available through the American Recovery and Reinvestment Act (ARRA) of 2009?32

BEV charging investments should receive the same level of incentives as other renewable investments, including wind and solar power.

36. Should utilities and/or government provide incentives that encourage customers to purchase higher-efficiency electric vehicles rather than less efficient electric vehicles, and if so, how should the incentives be structured?

Any purchase incentive program for BEVs should measure the relative efficiency of the products. Utilities could offer free or subsidized hardware for those customers that purchase the most efficient BEVs on the market.

37. How should the Commission ensure that any policies developed related to electric vehicles provide a level playing field for transportation fuels and technologies?

The Commission should consider the CO2 and local air quality benefits of any technology that it supports. The Commission should also be careful to incorporate the total Life Cycle Analysis of any technology to incorporate the CO2 impact of land-use, energy generation, and other impacts of all alternative energy strategies.

38. How could electric vehicle adoption impact other Commission policies and initiatives including the Renewable Portfolio Standard, the Long-Term Energy Efficiency Strategic Plan, energy efficiency goals, and zero net energy homes goals?33

No comment at this time.

Education and Outreach

39. What entities and programs best facilitate customer outreach and education regarding convenient and timely EVSE installation options and customer tariff education to ensure awareness of off-peak versus on-peak charging costs?

We believe a market based approach will encourage efficient behavior. Rates should be structured such that customers clearly see a noticeable difference in cost from charging peak versus off-peak (night).

Scope

40. Should the Commission consider natural gas vehicles as part of this rulemaking, or consider natural gas vehicle issues through utility filed Application(s) and/or Advice Letter(s)? What are the near-term tariff, infrastructure, incentive programs or other issues that the Commission should address with respect to natural gas vehicles?

We believe that California's natural gas resources are most efficiently converted into useful energy when consumed to generate electricity at scale in a power plant. In the long-term, we do not see natural gas powered small vehicles being an efficient energy strategy. Therefore, we do not encourage extensive investment in natural gas infrastructure for vehicle use.

41. Should the Commission consider medium-duty electric vehicles, heavy-duty electric vehicles, and off-road electric vehicles as part of this rulemaking? If so, what issues specific to these vehicles should the Commission consider?

BEV trucks, including material handling equipment and local delivery vehicles will be an important asset in California's clean vehicle portfolio. The Commission should consider strategies that encourage government and business fleets to reduce their emissions by replacing diesel trucks with electric trucks for short-range, high-usage applications. Port areas such as Long Beach and Oakland would especially benefit from investments in infrastructure that facilitate a transition from material handling equipment that burns petroleum locally to clean electric trucks and fork-lifts. The Commission should also encourage all of the utilities to convert their service fleets to electric trucks. These vehicles would be ideal candidates, especially in urban areas, for electric powertrains.

42. What other issues should the Commission consider in this rulemaking? What are your recommendations regarding those issues?

In every issue considered, Tesla Motors encourages the Commission to consider quality, safety, and standardization of investments. Tesla Motors is excited to be a part of a clean vehicle future for

California, and encourages the Commission to make efficient investments that can be utilized by the greatest number of Californian BEV customers possible. Tesla Motors is committed to helping California achieve the cleanest transportation strategy in the world, and is willing to participate in pilot programs, research, and outreach with customers, governments, and utilities as needed.

Sincerely,

/s/ Ryan Popple

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Dated: 7 October 2009

Ryan Popple

Director of Finance

Tesla Motors, Inc.