



April 18, 2014

Richard Corey, Executive Officer  
California Air Resources Board  
1001 I Street  
Sacramento, CA 95814

Re: Comments to Proposed Amendments to Section 1962.1, Title 13, California Code of Regulations

Dear Mr. Corey:

I am writing you to share Tesla Motors, Inc.'s comments to the California Air Resources Board ("ARB") staff proposed amendments to the fast refueling provision of the Zero Emission Vehicle ("ZEV") mandate pertaining to battery swap. We do not believe the staff proposal provides sufficient incentive for manufacturers to install fast refueling systems, in our case a battery swap network. An opportunity to increase ZEV sales by improving their utility with the expanded availability of fast recharging would be lost if the staff proposal were finalized. As outlined in greater detail below, we urge you to consider our alternate approach which encourages manufacturers to install fast refueling networks while also limiting credits to only those fast fueling networks that achieve a growing number of refueling events each year. Our proposal is technology neutral consistent with the direction of the Board.

Specifically, Tesla's proposal would require a manufacturer to achieve a percentage of refueling events (e.g., battery swaps) based on the eligible fleet<sup>1</sup> in order to earn Fast Refueling (FR) credits for the entire eligible fleet. The required percentage of refueling events to earn credits would increase each year, 2015 through 2017. No FR credits would be earned by the manufacturer until that threshold is met. Our proposal provides a stronger incentive for manufacturers to invest in fast refueling networks, while at the same time assuring credits are available only if FR is actually used. This approach is consistent with the Board's direction. In addition to providing a simpler and objective measure that encourages innovative technology introduction and use, our proposal also minimizes administrative burdens in implementation by tying credits to the number of fast refueling events, rather than miles.

We ask ARB to delay finalizing the ZEV amendments to consider our alternative proposal, and provide an opportunity to further discuss it with us and other stakeholders. We believe this can occur quickly, consistent with the time remaining to finalize the amendments. We are convinced that the expanded availability of fast refueling will help increase ZEV sales and contribute to achieving the sales targets required by the ZEV mandate, something both Tesla and ARB support.

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<sup>1</sup> "Eligible fleet" would include all those vehicles of a particular make and model in a particular model year capable of utilizing the battery swap capability installed in those vehicles at a battery swap station.

## I. **Tesla's Proposed Alternative**

At the most recent Board hearing, the issue of battery swap as FR was raised. Board members were concerned about ensuring that both *capability* and *use* were taken into account with ZEV refueling technology. In addition, the Board noted that any regulatory regime also must be applied in a technology neutral manner. The proposal offered by Tesla with these comments addresses both sets of concerns.

Tesla proposes a program that requires a certain number of FR events to take place for a given model year before the FR designation is awarded for that model year. The requirement would be based on a percentage of the number of vehicles placed. For example, Tesla recommends a threshold of 5% swaps for the eligible fleet for MY2015. Under this approach, a manufacturer delivering 10,000 FR capable ZEVs in California would need to perform at least 500 fast refueling events before it could obtain a FR designation for the fleet. This threshold would start at a lower level in MY2015 to make it achievable for new technologies being introduced, and increase in MY2016 and MY2017 to encourage continued investment in FR infrastructure. Such a program appropriately establishes an incentive to install the FR network, and an incentive that ensures it is used with increasing frequency for each eligible model year. No FR credits would be available until the threshold is met. The proposal also allows ease of administration in that rather than a complex set of calculations based on miles, the number of swaps is measured against the baseline of the total eligible vehicle fleet, thus providing easy accountability.

### A. Tesla's Proposal Encourages Technology Innovation and ZEV Adoption

Tesla's proposal meets the Board's objectives and is, in fact, part of the goal of increasing consumer acceptance of BEVs. Specifically, some of the major criticisms of BEVs are their small size, limited range and long recharge/refueling times. Tesla has already demonstrated that EVs need neither be small nor have a short range. With the award winning Model S that includes seating for five adults and two children in optional rear-facing child restraints, along with class leading cargo-carrying capacity, Tesla has demonstrated the utility and performance capabilities of EVs. With the unique battery architecture and a U.S. EPA rated 265 miles of range, daily driving distances are no longer an issue, and most recharging can be done conveniently and overnight at home. This leaves only the issue of longer trips, such as between cities. To address this, Tesla has made a large investment in our Supercharger network that provides up to 170 miles of range replenishment in as little as 30 minutes<sup>2</sup> at zero cost to customers. We have done this with our own funds, and no ZEV credits. Supercharger stations are available in California, as well as across the country, and we continue to expand the network.<sup>3</sup>

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<sup>2</sup> A full recharge utilizing Tesla's Supercharger takes approximately one hour.

<sup>3</sup> Tesla has installed 12 Supercharger stations in the state of California with a collective total of 77 individual charging booths. These, along with other Superchargers in the United States enable travel up and down both coasts and from LA to NY. Tesla plans to double that number in California by the end of this year.

Tesla strongly believes that convenient fast refueling will make ZEVs more attractive to consumers by alleviating so-called “range anxiety.” We believe our Superchargers are part of the solution that will allow owners to travel longer distances with their ZEV. We also believe that battery swap will further increase the utility of long-distance ZEVs by providing a faster recharging experience than the 170 miles in 30 minute rate already provided by Superchargers. Battery swap will meet this demand by allowing a full recharge through exchanging a depleted battery for a full charged battery in 15 minutes or less. We believe the availability of battery swap will remove the final impediment to using our ZEVs on every trip, thus providing the utility of a primary family car in the first ZEV capable of serving this role. This combination of utility, range, performance and recharge capabilities will help grow the market for ZEVs, and reduce emissions. In order to establish and expand the battery swap network, however, incentives in the form of greater ZEV credits than currently proposed are needed to hasten significantly the establishment of this new technology.

B. Full Credit for Battery Swap Appropriately Recognizes BEV Manufacturers for Offering a Variety of Convenient Refueling Options to Their Customers

The Board’s direction that the technology be both “available” and “in use” (or “being used”) does not mean that the requirement for full FR credit should be 100% of all miles traveled as the result of FR stations. For example, Tesla’s Supercharger network is clearly “in use” in California, yet it represents only a fraction of our customers’ total miles. This does not detract from the utility and value of the Supercharger network in that home charging is easier and more convenient for BEV owners. In fact, the Supercharger serves a specific need – the ability to travel long distances for free – hence, the location along major interstate routes between population centers versus actually in urban locations. Similarly, battery swap will likewise serve a portion of Tesla vehicle driver needs – the ability to “refuel” quickly where a premium is placed on time versus cost.<sup>4</sup> Rather than looking at these as singular options, the system as a whole will provide the greatest flexibility to ZEV drivers in terms of convenience, cost and utility– a distinct advantage over any other type of light duty vehicle propulsion available currently or even in the foreseeable future. As a result, Tesla believes that once a certain threshold of implementation is achieved the technology can clearly be considered “in use” and the entire model year of vehicles should receive the FR designation with full credit. To provide only partial credit fails to adequately incentive systems that seek to break down barriers not only to greater ZEV miles, but maximum possible ZEV adoption and uptake. Providing full credits based on a meaningful percentage of use, on the other hand, accomplishes these twin goals of the FR provisions and the ZEV mandate as a whole.

ARB staff’s current proposal, on the other hand, would award credits based on battery swap’s usage relative to that of well-established BEV charging methods such as home and public stations. If the goal of the FR provision is to create an incentive for manufacturers to invest in new technologies that improve the ZEV ownership experience, then ARB should not base its FR incentive on implementation relative to much more established technologies. The incentive should be based, instead, on the implementation milestones of the new technology by itself, and not tied to the success of other technologies. Like Superchargers, battery swap

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<sup>4</sup> Unlike the free Supercharger network, Tesla battery swap will involve a pay-for-utilization model at a price point similar to refueling a conventional gasoline-powered vehicle.

stations could be widely available and “in use” and still only represent a small fraction of the total electric miles of the Tesla fleet.

Furthermore, by making this comparison ARB establishes a structure whereby the success of Tesla’s Supercharger network actually takes away from our ability to earn ZEV credits. Every incremental Supercharger mile would mean less credits earned from our battery swap miles. This is counterproductive and does not further the goals of the mandate to maximize ZEV adoption. Accordingly, we urge ARB to take into consideration the alternate proposal offered by Tesla.

A. Counting Actual Swaps Provides Ease of Administration and Greater Accuracy

In addition to appropriate incentives, Tesla’s proposal also provides a simpler and more accurate means of measuring FR events. The ARB proposal should be revised and improved to take this into account. Specifically, the appropriate metric for battery swaps should be based on the number of swaps and not miles. Such a metric demonstrates actual use with full credit being provided only after meeting a threshold of frequency of use. This approach provides the appropriate incentive to help expand FR and the ZEV market as outlined above, and is straightforward to track and report to ARB.

ARB’s proposed amendment, on the other hand, would create a significant administrative burden associated with earning the FR credits. As proposed, Tesla would be required to identify, by VIN, each vehicle in the state of California that may utilize battery swap. The Company must log each of these events cross-referencing to VIN and tracing the mileage for each vehicle. Tracking swap information, pulling mileage information from vehicle logs (in addition to going above and beyond the data collection already permitted by vehicle owners), decoding the logs and cross-referencing by VIN will require many administrative man-hours and dedicated firmware and hardware resources. Tesla believes that a simpler approach is to count the total number of swaps as a percentage of the eligible fleet. This also provides a more accurate means of measuring FR use while still conforming to the Board directive regarding in-use performance.

In addition, our approach avoids some of the inherent accuracy issues associated with the current ARB staff proposal. Specifically, manufacturers would be required to submit data showing total electric miles attributed to fast refueling as well as total electric miles from vehicles in California. However, there is no mechanism to track California vehicles that are sold or moved to other states (where EV miles outside of California skew mileage data); or consumers who may turn off their telematics (something they are always free to do) or enter into areas without cellular service. There may be other issues as well with the mileage approach that can adversely impact the accuracy of the measurement and subsequently the credits. Such events or issues are outside of the control of the manufacturer and should not be used to the detriment of the manufacturer attempting to earn FR ZEV credits. As a result, Tesla urges ARB to reconsider its proposal in favor of a system based on the number for FR events.

**II. Conclusion**

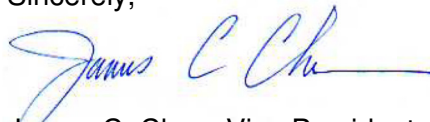
As a California company that is responsible for the resurgence of viable ZEV technology in the battery electric vehicle arena, and one that directly employs more than 5,000 Californians, we

ask you to seriously consider our comments and proposed alternative to staff's suggested amendments to 13 C.C.R 1962.1 regarding battery swap and FR. We believe that our proposal:

1. Provides sufficient incentive to a manufacturer to develop and install innovative fast refueling technologies like battery swap, that improve the utility of ZEVs, and thus increase their attractiveness to buyers;
2. Assures that credits are only earned if FR is actually used by consumers, and its use grows each year;
3. Is technology neutral; and
4. Requires easier reporting based on the number of FR events rather than mileage or other metrics which can result in an unreasonable or impractical administrative burden placed on manufacturers.

Thank you for your time and consideration. We are ready to meet with you to further discuss our proposal and address any concerns you may have.

Sincerely,



James C. Chen, Vice President of Regulatory  
Affairs & Associate General Counsel