

PROPOSED SECOND 15-DAY MODIFICATIONS  
 Amendments to Section 1962.1  
 Comments by American Honda Motor, Co., Inc.  
 May 23, 2014

Honda supports the joint comments submitted by the Alliance and Global Automakers regarding this second 15-day notice. In addition, Honda would like to make the following comments:

In general, Honda believes that regulatory certainty is essential for automakers' planning. This means that wherever and whenever possible, the Air Resources Board should create credit schemes such that an OEM can know the full value of credits to be earned by a vehicle prior to the introduction of that vehicle into commerce. In the current ZEV regulations, all credits can be known beforehand, with the exception of the transportation system credits, so that an OEM can plan accordingly.

As we understand the goals of the "fast refueling" credits in this regulation, it is to reward utility approximating that of conventional gasoline vehicles that have ubiquitous fueling stations and refueling speeds of less than ten minutes. As such, we recognize that the first 15-Day proposed regulations were too onerous (stringent requirements for documentation and credits only proportionate to battery swap miles). On the other hand, this second revision is, perhaps, too generous. Allowing a single battery-swap event to represent the utility envisioned by the agency is simply too low of a threshold.

It seems that the Air Resources Board could create a formula to determine the number of battery swaps necessary to approximate the conventional vehicle utility that is being sought. By using SAEJ2841 (Revised Sep 2010) "Utility Factor Definitions for Plug-In Hybrid Electric Vehicles Using Travel Survey Data" it can be estimated what percent of days & trips cannot be achieved by the EV's range. If we assume that days & trips exceeding an EV's range are candidates for battery swap, we can arrive at the number of battery swaps that would approximate conventional vehicle parity.

In the table, below, we have assumed that a battery swap cannot occur when the battery range drops to zero; we use a reserve range of 40 miles, which approximates the miles left in a typical vehicle's gas tank when the fuel warning light activates. The resulting "usable" range has a utility, according to the SAE study, shown as a percent of days for which the vehicle's usable range can fully meet the average driver's needs. The Gap is then calculated as the difference between 100% and the Utility. Since the SAE study is based upon average daily trips and miles per day, we can multiply the Gap by 365 days and estimate the number of days/battery swap events that would approximate conventional vehicle usage. This makes intuitive sense – higher range vehicles should need fewer battery swaps and lower range vehicles should require significantly more battery swaps. Another factor at play, of course is the ubiquity of the battery swap stations. However, at this time we have no data on this factor, and it would tend only to increase the "reserve range" set here at 40 miles.

<b>AER</b>	<b>Usable</b>	<b>Utility</b>	<b>Gap</b>	<b>Annual Swaps</b>
300	260	97%	3%	10
260	220	96%	4%	14
220	180	94%	6%	20
180	140	92%	8%	30
140	100	87%	14%	49
100	60	74%	26%	94

Finally, while we support fast refueling credits, we believe it is important for ARB to consider the range of applications upon which fast-refueling credits could be generated. It is clear that the credits earned

from fast refueling have significant value, and may result in unusual incentives. Combining a fast-refueling event with a tire rotation or other inexpensive service, for example, could generate credits in a way not originally envisioned by the board.

We hope this thinking is found to be useful by the staff of the Air Resources Board as they consider the optimal approach to establishing battery swap requirements for the fast refueling credits in this regulation.