

California Energy Commission
Dockets Office, MS-4
Re: Docket No. 09-ALT-1
1516 Ninth Street
Sacramento, CA 95814-5512

DOCKET 09-ALT-1
DATE _____
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The following comments are focused specifically to your objectives related to expanding fuel infrastructure and ultimately reducing carbon footprint. I have also written to U.S. Secretary of Energy Stephen Chu with the confidence that, at some level, the merits of the idea will gain a hearing. Succinctly my comments follow.

Electric cars are poised to become a significant part of the American experience in the near term. The two main barriers to that explosion are:

- **Infrastructure** There is no network of places where an electric vehicle can stop and recharge a battery. Even if there were it takes too long to recharge the battery. This severely restricts the convenient use of the electric vehicle except for local use.
- **Technology cost** (batteries cost a lot and must be replaced during the life of the vehicle. Even with improving technology – the battery remains expensive. This expense could be prohibitive to many would be owners)

In your mission to decide how to complement public and private investment in transportation I urge you to consider the following recommendations that I believe will be effective in removing both of the above barriers and have the beneficial effect of spurring the economy.

Infrastructure Recommendation:

We should make use of the present base of petroleum stations as service points for batteries. Several EV automakers and independent third party companies are presently working on standard replaceable battery pack devices that could be “swapped” at conveniently located service points in about the same time as is needed for a gas refill. If fully in place this could place accessible battery power on a par with gasoline accessibility I am trying to encourage DOE and other influential groups, such as yours, to endorse this strategy as the infrastructure model for fueling electric vehicles. If the infrastructure supports the replacement of the battery as the mode of refueling electric vehicles then eventually all manufacturers will move to a strategy of manufacturing electric vehicles with replaceable batteries. Petroleum stations will want to participate because this will drive customers to their business. However, to make this work to the advantage of everyone several new but critical changes are required.

1. A Battery Network Service Provider (BNSP) must emerge. (This is where your help and the help of DOE are needed). The purpose of the BNSP is to have a presence at or near petroleum service points. Logically it seems that a petroleum service would want to host a BNSP for the added business it would drive to the location The BNSP is a separate industry and not necessarily a part of the petroleum service industry. The BNSP would have an available inventory of fully charged “swap” batteries. Importantly the BNSP would be required (by law) to recharge batteries using renewable energy sources (only). Electric Car manufacturers would be encouraged to employ sufficient technologies such that the vehicle receiving the swapped battery could evaluate the charge of the battery and immediately identify defective replacements. Vehicles might also be equipped to automatically call ahead (or call locally) to identify service points that have their specific battery type available. *(These particulars will be worked out in the market place.)* The BNSP is a private business (ultimately an industry) but I believe it must initially be government initiated and sponsored by important groups such as yours in order to jumpstart the EV refueling infrastructure.

Technology Cost Recommendation

Secondly, the most critical and expensive technology in electric vehicles and hybrids is battery technology. I am proposing that the Battery Network Service Provider (BNSP) owns all electric vehicle batteries. This means that the EV owner never buys a battery or owns the cost of replacement. The car owner leases the battery from the BNSP. Any non-performing battery is returned to the BNSP for a fully charged operating battery. The EV owner insures the battery against accidents and loss (vehicle insurance) and swaps it at the BNSP (for a service fee) as needed for a fully charged battery. Since batteries are expensive this approach assumes initially a substantial subsidy by government to the BNSP. Or, alternatively, some arrangement with car (or battery) manufacturers to assign batteries to the BNSP to create a battery inventory and to install renewable methods for battery recharge.

Advantages

- This action immediately reduces the cost of electric vehicle ownership and operation and spurs the economy. (The electric vehicle owner no longer needs to purchase and replace the battery)
- This action creates an infrastructure for refueling electric vehicles.
- By requiring the BNSP to use only renewable fuels to recharge batteries we accomplish a further goal of reducing demand on fossil fuels.

Everybody wins.

I am pleased to have a forum to present my idea. I hope that someone takes it seriously – otherwise we may be adopting our methods from Asia and Europe for the remainder of the century.

Thanks for your attention and thanks for your willingness to consider this idea.

Sincerely,

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