

RICHARD F. TEEBAY

California Energy Commission

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California Energy Commission
Dockets Office, MS-4
1516 Ninth Street
Sacramento CA 95831-5512

Attn: Commissioner Janea A. Scott
Commissioner Karen Douglas

Dear Commissioners Scott and Douglas,

My name is Richard Teebay. I am employed by the County of Los Angeles and, with Patricia Kwon of the South Coast Air Quality Management District, I serve as Co-Chair of the Southern California Association of Governments' (SCAGs) Plug-In Electric Vehicle (PEV) Coordinating Council. I am also a Co-Chair of the Los Angeles Economic Development Corporation's e-4 Mobility Alliance (formerly the e-Mobility Task Force). I am writing you today as a private citizen and not as a representative of my employer, the SCAG PEV Coordinating Council, or the LAEDC's e-4 Mobility Alliance. Thank you for allow me to submit my comments.

I have been actively engaged in creating and recreating the EV infrastructure within the Los Angeles region for several years. I applied for, and the County has been awarded, four grants to install EVSE, primarily at County worksites. I purchased a Nissan LEAF about two and a half years ago, and have driven it more than 34,000 miles. As a battery electric vehicle (BEV) driver, I know that range and public charging REALLY matter.

Late last year, I spoke with Richard Lowenthal of ChargePoint. Richard said that both the San Francisco Bay Area and the greater Los Angeles region had about 20,000 PEVs, with the Bay Area having a few more. He said that in the Bay Area, the Nissan LEAF out sells the Chevrolet Volt. But in the Los Angeles region, the Volt out sells the LEAF. He attributed the differences to two factors. Those in the Los Angeles region have longer commutes. And the Los Angeles region has less than half the number of public EVSE available in the Bay Area. Considering that Los Angeles has twice the population of the Bay Area, the lack of EVSE infrastructure appears to be a significant barrier to adoption, and certainly impacts sales of BEVs.

My comments expand upon those of several of the participants including Richard Lowenthal (ChargePoint) and David Petersen (Nissan) at the June 5, 2014 workshop. I would like to address several issues raised by the Commissioners during the June 5, 2014 Workshop:

- How can we achieve the Governor's Goal of having more than a 1 million ZEVs on the road in California by 2020, and 1.5 million ZEVs by 2025?
- (How and) When can the State stop subsidizing the cost of these vehicles and their infrastructure?
- Where should the State (and others) focus their efforts and funding: on the Home Dominant Model, or High Public Access Model?

The Pyramid:

Much has been made of the "Charging Pyramid." For the first generation EVs (the EV-1, Toyota RAV4-EV, Ford Ranger EV, Honda EV, etc.) the most common form of charging was workplace. Few of us had more than 110v at home because these were truly compliance cars leased to our employers. With the notable exception of the 85 kWh Tesla Model S, the current range-limited PEVs are targeting mainstream retail customers. Of the 65,000+ Clean Car Rebates issued, less than 1% (fewer than 650) rebates have been issued to public agencies.

Currently, more than 80% of all charging occurs at home because, for all practical purposes, there are few other places where one can recharge their vehicle. Charging at home is not a choice – it is a necessity.

More than 90% of home charging occurs in single family residences. This excludes almost half the State's households who live in Multi-Family Dwellings (MUDs). In communities like San Francisco and Santa Monica, more than 75 % of the households live in MUDs.

In Slide 6 of Leslie Baroody's presentation, she notes that there are now 5,038 Level II plugs and 141 DC Fast Chargers in California. This is significant progress. But there are currently more than 83,000 PEVs Statewide. That means that there are approximately 16 PEVs in California for each Level II plug and almost 600 PEVs for each DC Fast Charger.

The Pyramid is a picture of the present. It should not and must not be a vision for the future. In 2012, there were more than 14.5 million vehicles registered in California. Fewer than 80,000 of them were PEVs. This level of market penetration is a rounding error. At the turn of the last century, circa 1900, horses were the major form of transportation for both personal and goods movement. By 1930, horses had been completely replaced by petroleum-powered vehicles. In 1900, cars were unusual and a novelty, just as PEVs are today. Many "early adopters" had small gasoline tanks and pumps at home or on their property because there wasn't "a gas station on every corner." The Pyramid of 100 years ago is not today's model. We should be focused on getting 1 million PEVs on the road by 2020. We should not limit our vision by a picture of the present.

INFRASTRUCTURE:

CURRENT POSTULATE: Charging is needed at Home, at Destinations, and at Work

Subsidies vs. Building Standards/Requirements:

Infrastructure – EVSE and/or DC Fast Chargers can be either low cost or very high cost depending upon whether or not there is adequate power available (transformers, panels, etc.), whether or not trenching is required, and/or whether conduit must be run. A low cost measure that would reduce future subsidies would be to modify building codes and requirements so that when new and/or significantly remodeled residences (i.e. 50% or more of the original square footage) are approved, electrical panels would be sized and that there be power stubbed for the future addition of a Level II EVSE.

New MUDs and/or significant remodels that require code upgrades should also be required to install a percentage of Level 1 and Level II stubs, blanks for additional panels, and pads for transformers to facilitate future demand.

Resurfaced parking lots (commercial lots of a certain size 50 to 100 or more vehicles) could be required to install conduit and footings for EVSE to be added at a later date. (The City of New York's ordinance could be a model.)

In December 2013, the City of Santa Monica opened Parking Lot 6 on Second Street with parking for 360 cars. On day one, there were 30 Level II EVSE – some on each level of the parking structure. But what is most innovative is that the structure has blanks for additional panels, pads for additional transformers, and conduit runs, so that the City can incrementally add up to 130 more Level II EVSE in stages as demand builds. The County of Los Angeles is applying this practice to two parking structures currently under construction for 1,350 vehicles at its new Service Center in Van Nuys. The County's site also includes three pads for DC Fast Chargers.

DC Fast Chargers:

Demand Charges represent more than 20% of the County's annual electricity costs. When there is a Flex Alert, it is not always possible to shed loads at the County's hospitals and jails. I am aware of several incidents when a single use of a DC Fast Charger has added thousands of dollars to a given site owner's monthly electricity costs. One of two possible solutions would be for the CEC to provide larger incentives for 25 kWh than for the 50 kWh DC Fast Chargers. The increased five minute dwell time should be relatively minor for an 80% charge. A second option would be to pair the DC Fast Charger with Storage (such as the 16 CEC funded Green Charge Networks Demand Charges represent more than 20% of the County's annual electricity costs. When there is

a Flex Alert, it is not always possible to shed loads at the County's hospitals and jails. I am aware of several incidents when a single use of a DC Fast Charger has added thousands of dollars to a given site owner's monthly electricity costs. One of two possible solutions would be for the CEC to provide larger incentives for 25 kWh than for the 50 kWh DC Fast Chargers. The increased five minute dwell time should be relatively minor for an 80% charge. A second option would be to pair the DC Fast Charger with Storage (such as the 16 CEC funded Green Charge Networks DC Fast Chargers). I predict that storage will be a huge opportunity in the coming years.

When the CEC funds a DC Fast Charger, funding should be included, and/or require, that the awardees a stub for at least a second DC Fast Charger at each site.

I have met many LEAF drivers who leased their cars within the past 15 months because of the free to use DC Fast Chargers at the dealership. Most of these DC Fast Chargers are no longer free. Many of those drivers, especially those who live in MUDs, feel particularly betrayed by dealers, one of whom is now charging as much as \$10 per charging session for the DC Fast Charger.

Workplace Charging:

I believe that Workplace Charging is by far the most overlooked opportunity. When one purchases a vehicle, the overriding issue is "will the vehicle meet my needs?" Soccer Moms (and Dads, like me) may want a two-seat roadster, but we purchase and drive vans and SUVs capable of hauling the team and all of its "stuff." When we purchase vehicles that we commute in, they must be capable of getting us back and forth to work. If a limited range vehicle can't do this, we cross it off the list and purchase a vehicle that will.

The County has 101,000 employees. The average employee's commute one way is 24 miles. The emissions from the County's employee commute is 32% of our total GHG emissions. In Alameda County, the employees' commute is almost 40% of the County's GHG emissions. (Both are Scope 3 Emissions.) If the average County employee purchases a Ford Energi or a Chevrolet Volt, they will drive e-miles most/all of the way to work. But their drive home will not be all e-miles UNLESS they have access to workplace charging.

Of the County's 2600+ sites, 70 sites have more than 250 employees. Most of these sites are both large worksites AND destinations. The UCs and Cal State Universities are BOTH workplaces and destinations. Hospitals, large clinics, civic centers, courts, etc. are both workplaces and destinations.

A frequent and costly "mistake" is that a site will install only one or two EVSE at a site. The CEC should insist on a minimum of three EVSE per site and require

stubs for an equal number of future EVSE. (If four or six EVSE are funded at a site, there will be four or six stubs for future expansion.)

During the Great Depression, Willie Sutton was asked why he robbed banks. He responded "That's where the money is." Using the same logic, where should we be installing EVSE and DC Fast Chargers? (Hint – "where the cars are.")

Storage and Charging and Bi-Directional Flows:

The University of Delaware, the Department of Defense, and others are researching bi-directional flow. In a decade or so, we may see worksites using the vehicles in the parking lot as rolling "storage" to avoid Demand Charges and/or provide Peak Shaving. Buy this cannot happen without significant Workplace Charging.

State and Local Agency Vehicles:

Both were State and local agencies were decimated by the recent Great Recession. Revenues collapsed, employees who left were not replaced, vehicle purchases were "deferred," and vehicle replacement cycles were extended – even for emergency vehicles such as the Sheriff and Highway Patrol. With a lack of funding for the routine, there has been little funding for new initiatives. Where projects have been funded, those responsible have frequently been far outside their area of competence and expertise. They have been focused on just keeping the lights on and the doors open. They are given yet another task, and simply want to cross it off their to-do list one way or another.

As noted much earlier, government agencies have filed for fewer than 650 of the 65,000 Clean Car Rebates. Local and possibly State agencies have not been early adopters. I suspect that most of those agencies that have filed are primarily Municipally Owned Utilities subject to Federal EPACT requirements. Government agencies are not eligible for the Federal Tax Credits available to private citizens and businesses. So one thing the Energy Commission and other funding agencies could do for these agencies would be to earmark funding for government agencies to buy down the significant cost difference between a conventional sedan and a PEV – possibly \$5,000 in lieu of the \$7,500 Federal Rebate and \$2,500 in lieu of the \$3,750 Federal Rebate.

Another option would be to create a special program for government with the manufacturers' Certified Pre-Owned vehicles (CPO). PEVs lose much of their value in the first year because if one purchases a new PEV, there is up to \$10,000 in rebates. So LEAF that is less than a year old and sold new for \$30,000 will on the dealer's lot for \$19,999, regardless of its mileage. The Energy Commission could provide rebate (like the HVIP) to buy down a CPO PEV – possibly \$3,000 in lieu of the original \$7,500 Federal Rebate and \$1,500 in lieu of the \$3,750 Federal Rebate.

NREL

I am especially impressed by NREL's work. They are to be commended for their approach and the readability of their product. But I have two issues with their work. I believe that one of their most critical assumptions is wrong. NREL assumes that the average vehicle is driven just 20 e-miles per day or 7,300 e-miles per year. If this assumption is correct, the 110 volt home charging would be sufficient and there is no need for public infrastructure. However, if we have any hope of reaching the mass market, and truly reaching 1 million cars on California roads by 2020, the daily average must be 35 to 45 miles per day (12,775 miles to 16,425 miles per year). Fleets need vehicles capable of 200 to 300 miles per business week – not 20 miles per day.

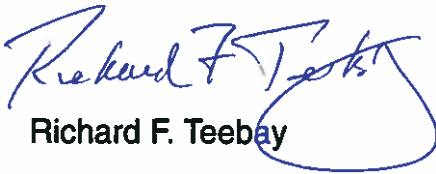
We cannot rely on our recent past and the present to guide our path forward. Reaching the Early Adopters is far different from reaching the Masses. And we need to reach the masses. My wife is not an early adopter. She would never put up with the frequent stops that I make to recharge. And she wouldn't alter her life to make my LEAF fit her needs.

I believe that the choice between the two Pyramids is a false choice and is based upon the 20 e-miles per day.

Long haul truckers look as down the road as possible so that they have more time to stop, or so they can gain speed as they approach a hill. I would hope that like a long haul trucker, we would look further down the road rather than to go forward based solely on our recent past.

Thank you for allowing me to provide my comments.

Respectfully,



Richard F. Teebay