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Sierra Club CA Comments on EVSE Workshops 8-4 & 6-20

Additional submitted attachment is included below.

SIERRA CLUB
CALIFORNIA

August 27, 2020

The Honorable Patricia Monahan
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

Docket No. 20-IEPR-02

Submitted electronically via rulemaking docket

RE: Integrated Energy Policy Report Commissioner Workshop on Plug-in Electric Vehicle Charging Infrastructure

Dear Commissioner Monahan:

We are impressed with the rapid progress being made simultaneously on multiple component projects towards the California Energy Commission producing its first integrated AB 2127 Electric Vehicle Supply Equipment (EVSE) plan and report.

We appreciate the opportunity to provide these comments.

1. Presentation: Examining Existing Infrastructure Needs, Throughout California, Including Low-Income Communities - Tiffany Hoang, CEC

Citizens living in multiple unit developments (MUDs), rented and leased housing, etc. are underserved with EVSE. We believe that not only should SB 1000's objectives be interpreted to insure that people living in disadvantaged communities (DACs) are served with adequate EVSE but that people living in certain housing categories, irrespective of whether they live in a DAC or not, must also be insured to have adequate EVSE.

We recommend that the CEC track where people live by housing category, monitor the status of how much EVSE is available, determine if there are deficiencies and then recommend how to bring EVSE into these housing categories.

There are two key options for how to provide EVSE for people living in e.g. MUDs with no or inadequate EVSE. One is to install more EVSE at the MUD and the other is to provide public local plaza direct current fast charge (DCFC) EVSE stations. **We recommend that the CEC do some alternative cost modeling to see which of these might be the most cost effective or advantageous based on a number of criteria. This may then guide the best model or mix of models for planning purposes going forward.**

Further, we recommend that the CEC develop recommendations to the California Building Department on new construction rules that will continue to support more EVSE at MUDs and other rented or leased housing. For example, current building codes require a certain

percentage of parking stalls to have EVSE. New regulations should require even higher percentages of parking stalls to have EVSE to accommodate the expected rapid increase in EV adoption. This is critically important because about 50% of Californians live in MUDs and charging accessibility is a significant obstacle to broad adoption of EVs.

2. Presentation: Charging Equipment Hardware and Software - Noel Crisostomo, CEC

We all agree on the critical importance of having and requiring hardware and software standards that are interoperable for all aspects of the electric vehicle charging process so that it is convenient, consistent and easy for the end user.

Some of the key aspects of charging that need to be standardized include but are not limited to the following:

- Physical charging connectors (CCS Type 1)
- Communications between the vehicle and the grid (ISO/IEC 15118)
- Equipment Management (OCPP 1.6J, 2.0 or others IEC 63110)
- Inter-Network billing management (OCPI or OICP)
- Utility Demand & Price Signals (OpenADR 2.0b or SEP 2.0b)

From the presentation we are yet not clear on the current status of these standards, where they need to end up or what needs to happen to get there. **We would recommend that the final report develop an EVSE Standards Roadmap that addresses at least the following:**

1. **List each of the areas for equipment, software or functional requirements that must exist to fully meet interoperability and ease of use objectives.**
2. **What is the current status of the standard, does it do the job currently, must it be further developed, is it in use today, is that use required or voluntary?**
3. **If there is any gap between what must be in place and what exists, what is that gap?**
4. **What can the CEC and/or other state agencies do to fill the gap and who has that responsibility?**
5. **What is the timeline for completing this?**

As an example of accomplishing statewide implementation of some of the needed standards, CARB Adopted Regulations for EVSE standards for the following on 6/27/20.

§ 2360.1 Requirements for Labeling Electric Vehicle Supply Equipment
§ 2360.2 Payment Method Requirements for Electric Vehicle Supply Equipment
§ 2360.3 Facilitating Roaming Agreements
§ 2360.4 Reporting for Electric Vehicle Service Providers

3. Presentation: EVSE Deployment and Grid Evaluation (EDGE) Tool - Micah Wofford, CEC

As we understand it, the EDGE tool's key output is electrical capacity availability by Traffic Analysis Zone (TAZ). This result can then indicate where there is sufficient capacity to support needed EVSE or help utilities plan grid infrastructure upgrades needed if there is insufficient capacity. We are not clear on where the dividing line is between the CEC's EVSE infrastructure needs planning stops and where local community/utility detailed location infrastructure planning begins. **We would recommend that the CEC clarify this question and perhaps more fully describe how this handoff occurs and/or how the affected utilities / community planning**

organizations can be brought into the planning process early with the CEC and partner in producing the final EVSE implementation plan for each TAZ and associated distribution circuits.

4. Presentation: Other Charging Programs to Accelerate EV Adoption - Noel Crisostomo, CEC

The Transportation Electrification Regulatory Policies Act (TERPA) concept appears to be a very promising one. The concept of having pre-qualified EVSPs design and cost out the optimal plans and then bid in a reverse auction to achieve the maximum avoided cost of charging is a good one. It has the potential to produce the lowest cost for the best solution and make the best use of limited public funds. However, this is a complex concept and it's not easy to follow some of the details on how it would actually work. **We recommend that the CEC prepare some additional documentation of TERPA and Avoided Cost of Charging concepts so that a broader audience can better understand how it can work and more robustly support its adoption and implementation.**

General Comments

It is very encouraging to see the thoughtful progress that the CEC is making in EVSE planning. EVI-Pro II is making significant real-world experience informed updates to many of its key assumptions and in combination with the new models including,

- Hevi-Pro for MHD vehicles,
- EVI-Pro RoadTrip to plan for road trip charging needs and
- Widespread Infrastructure for Ride-Hailing EV Deployment (WIRED) to plan for TNC needs

will result in a much better idea of total EVSE needs to meet the state's requirements.

One piece that is mentioned but not yet developed is the off-road, port and airport charging needs. There are others as well including for electric transportation refrigeration units (eTRUs) that will also need to be considered to complete the total charging infrastructure needs for the state. **We recommend that the CEC describe its plan for including these use cases in the final AB 2127 report.**

When each of these studies are completed, their results will need to be integrated to eliminate double counting EVSE needs. Combining total needs at stations will inform how to right size them to meet multiple needs, achieve potential synergy and potentially result in cost reductions due to economies of scale. **We recommend that the CEC describe its thinking on how and when these models' results can be integrated**.

The key demand assumption for light duty EVs has been to plan for the EVSE needed to support 5 million cars by 2030 based on Governor Brown's Executive Order (EO). However, subsequently he also issued an EO calling for carbon neutrality by 2045 and there are other federal and state policy drivers requiring more rapid adoption.

Therefore, we recommend that another planning scenario be prepared calling for 100% ZEVs on the road by 2045. The new scenario's goal by 2030 should be determined based on a reasonable ramp needed to get to that 2045 goal and in order to achieve this we must assume 100% of car sales to be ZEV by 2030.

5. Presentation: Zero-Emission Vehicles Needed to Meet California's 2030 Clean Air and Climate Objectives - Joshua Cunningham, California Air Resources Board

ZEV Demand assumption for LD ZEVs - Slide 5 shows that the percent of annual sales of PEVs must be greater than depicted in the graph in order to achieve 100% ZEVs on the road by 2045 to achieve carbon neutrality. The slide notes that
"100% sales ZEVs & PHEVs by 2035; Not aggressive enough.
PRELIMINARY - New scenarios to be released in fall 2020."

We agree that these goals are not sufficiently aggressive and look forward to the new scenarios this fall. **We recommend that another planning scenario be prepared calling for 100% ZEVs on the road by 2045 and showing milestones along the way for 2030 and other key dates.**

It is likely that the Advanced Clean Cars II rulemaking will require a faster transition to ZEVs than the current assumption does, which is critical because the ZEV rule requires that 22% of all vehicle sales be zero emission by 2025. The PEV sales in California for 2019 was only about 8% of all vehicles.

Sales could increase dramatically over the next few years stimulated by:

- Lower vehicle purchase costs due to:
    - Continuing battery cost declines – Bloomberg New Energy Finance (BNEF) forecasts that battery pack costs will reach $100 / kWh in about 2023 at which point several models of electric vehicles will be at purchase cost parity with internal combustion engine vehicles
    - Economies of scale due to larger volumes and
    - Cost support via the low carbon fuel standard (LCFS) funded Clean Fuel Rebate program.
- An increasing number of new models and a variety of vehicle types to meet a broader portfolio of customer needs from most car OEMs.
- Increased consumer recognition of the lower total cost of ownership (TCO) of EVs compared with internal combustion engine vehicles due to lower fuel and maintenance costs.
- Continuous charging infrastructure growth and ubiquity as well as increases in power to shorten charging times, all due to the efforts of the CEC, CPUC, CARB, GoBiz, privately funded EVSPs, OEMs and others.
- New models of financing EVs such as monthly subscription models without up-front down payments or long-term commitments.
- A growing and thriving secondary market that will make EVs more affordable for a larger portion of the population

ZEV Demand Assumption for Medium Duty Vehicles (MDV)s - Slide 7 shows a scenario for transitioning MDVs that only results in 60% zero-emission vehicles on the road by 2045. This is not aggressive enough to meet California's many goals including carbon neutrality by 2045. CARB recently approved the Advanced Clean Truck (ACT) rule and its approving resolution calls for a target of 100% medium and heavy- duty (MHD) ZEVs by 2045. It is working on a fleet rule that will significantly help support this. These forecasts need to change to be in

conformity with our state's requirements and then can work to make it happen. **We recommend that 100% ZE MDVs by no later than 2045 should be the assumed objective**.

ZEV Demand Assumption for Heavy Duty Vehicles (HDVs) - Slide 8 has the same problem as for MDVs. The current Mobile Source Strategy for ZE HDVs is too low, is currently in the process of being updated and needs to be revised to get to 100% ZE HDVs on the road by 2045. We need policies to no longer allow any low NOx vehicles within California by no later than 2045 and work with the Federal EPA to get rules at that level nationally as well. **We recommend that 100% ZE HDVs by no later than 2045 should be the assumed objective.**

6. Presentation: Electric Vehicle Infrastructure Projection Tool (EVI-Pro) - Eric Wood, National Renewable Energy Laboratory

We are encouraged by many of the improvements in the EVI-Pro II model and in its updated assumptions compared with the original EVI-pro model.

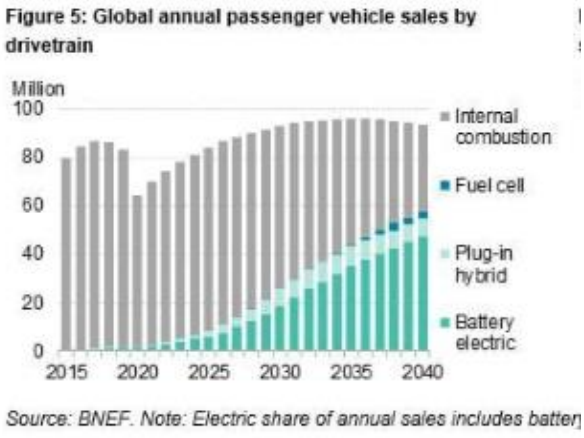
We would like to offer the following recommendations on assumptions:

a. PHEV / BEV split – while the new assumptions more appropriately increase the relative percentage of BEVs vs PHEVs. **We recommend that the percentage of EVs that are BEVs be increased to at least 80%.**

These are the current assumptions shown in the presentation.

	EVI-Pro 1	EVI-Pro 2
CA Fleet Size	1.3M PEVs	5.0M PEVs
PHEV/BEV ratio	45%/55%	32%/68%
Sedan Share	100%	71%

According to BNEFs recent Electric Vehicle Outlook 2020 report, at the global level, it appears that PHEVs will be closer to only about 15% of total EV sales with BEVs at about 85% as shown in the graph below.



This change is being stimulated by a number of factors including:

- Ranges have been going up and most new BEVs have ranges over 200 miles with some announced at over 500 miles. In combination with growing charging infrastructure and faster charging times, range anxiety is much less of a concern.

- As battery and BEV costs come down, PHEVs may even cost more than BEVs because of the cost of two drive trains.
- The TCO for BEVs will be better than for PHEVs due to lower fuel and maintenance costs.
- OEMs will be less inclined to make PHEVs with a shrinking market.

Further, we believe that the stated assumptions of high PHEV fractions for e.g. pickups, large SUVs, etc. will not hold true because of reductions of battery costs and increased battery density reducing size and weight. Tesla's Cybertruck, for example, will have a range of up to 500 miles and Rivian's pickup truck's range will be 400 miles. **We recommend that the percentage of vehicles in these vehicle types that are BEVs be increased as well**.

7. Presentation: DC Fast Charging Infrastructure for Electrified Road Trips (EVI-Pro RoadTrip) - Dong-Yeon Lee, National Renewable Energy Laboratory

We are pleased at the thought that went into creating this new modeling tool to capture the EVSE needs for road trips which were not considered in EVI-Pro.

For the "California Electrification Projections" instead of using the "CEC Energy Assessments Divisions Forecasts by 2030. (Low: 1.5 BEVs; Aggressive: 3.1M BEVs)" **we recommend that a much higher set of assumptions should be used as we have discussed earlier such as e.g. Low: 4M BEVs (80% BEV fraction of 5M PEVs) by 2030 as the baseline and a higher number as determined to be necessary such that we are at 100% BEVs on the road by 2045.**

We agree that road trip EVSE charging stations along transportation corridors may offer the opportunity to integrate with solar and/or storage. Doing so could lessen the grid capacity requirements in locations where it may be expensive to upgrade the grid. Also, integrating the needs of light-duty PEVs with the needs for MHD EVs defined via Hevi-pro may enable economies of scale. Depending on how the station is designed with solar and storage, it could also provide charger electricity resiliency to protect against loss of power in an electrical outage.

We support the notion of exploring siting some DCFC EVSE stations at gas stations both for road trips and in urban/suburban areas. As DCFC stations begin to have higher power – e.g. 250kW, this becomes even more compelling with much shorter charging times. The business model of selling fuel (now electricity) and food might very well continue to work.

8. Presentation: Medium- and Heavy-Duty Electric Vehicle Infrastructure Projections (HEVI-Pro) Bin Wang, Lawrence Berkeley National Laboratory

We are pleased to see this new modeling tool and this study does an excellent job of considering the wide diversity of vehicle types, use cases, charging requirements, etc. in developing its forecasts of needed EVSE. This data will be invaluable to CARB as it works on its Advanced Clean Fleets Regulation and as the CPUC and the IOUs work to build out their charging infrastructure plans to meet the needs of MHD BEV trucks.

This study correctly states that "CARB's Advanced Clean Trucks regulation requires an increasing share of trucks sold in California to be zero emission starting in 2024, leading to a full transition to ZEVs by 2045." The study uses the MHD adoption assumption from the current Mobile Source Strategy plan and assumes 133,000 MHD trucks on the road by 2030. As we've noted above, the plan is in the process of being updated and currently does not achieve the latest policy targets from the state. There will be about two million MHD trucks on California's roads by 2030 and 100% of them will need to be zero emission by 2045. **We recommend that the assumption on the number of BEV trucks on the road in 2030 and on other milestone dates be updated based on the assumption of 100% ZEVs by 2045 with the assumption for 2030 based on a reasonable trajectory needed to achieve the 2045 goal.**

9. Presentation: Optimizing charging infrastructure buildout for transportation network companies (TNC) electrification - Widespread Infrastructure for Ride-Hailing EV Deployment (WIRED) model - Alan Jenn, PhD, Institute of Transportation Studies, University of California Davis

We are glad to see this well conceived new modeling tool and approach being developed. A next step is to integrate the results of this study with the other models for total EVSE needs.

Summary

Overall, we believe that the CEC is making excellent progress on EVSE planning. Further research using additional data sets, empirical validation with more real-life scenarios, cross model integration, adding off-road charging needs and incorporation of existing charging stations will produce a comprehensive plan of needed EVSE. **We recommend that the CEC initiates, or completes a modeling effort for off-road charging needs and eTRUs to fill this last remaining gap in overall EVSE planning.**

The demand number assumptions are too low and need to be increased to be consistent with having 100% ZEVs on the road by 2045. This is necessary to avoid significantly underestimating the volume and timing of EVSE needs.

In the light-duty space, a study to compare the costs and benefits of installing more local DC fast chargers vs more chargers directly at MUDs needs further research to determine the optimal solution based on a number of criteria – cost, time efficiency for driver, convenience, etc. This study will be beneficial to all agencies and the utilities in starting to plan on how to accommodate these needs. Installing chargers to meet the EVSE needs of those living in MUDs will help remove the single biggest obstacle towards widespread adoption of electric vehicles.

Sincerely,

Ray Pingle
Lead Volunteer on Vehicle Electrification Policy

Katherine Garcia
Communications Associate & Policy Advocate