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Re: Comments on Proposed CALGreen Changes from Coalition of Public Agencies

These comments are submitted by a coalition of public agencies, including the Bay Area Air Quality Management District, Peninsula Clean Energy, East Bay Community Energy, Redwood Coast Energy Authority, Sonoma Clean Power, MCE (formerly Marin Clean Energy), and Clean Power Alliance (“Joint Agencies”), representing 11 million Californians. The Joint Agencies appreciate the opportunity to provide comments to the 2022 CALGreen triennial update. The new code cycle will likely be the basis of thousands of new residential units, providing a critical opportunity to enable low-cost and broadly accessible electric vehicle (“EV”) charging infrastructure to residents. For the benefit of California residents, the economy, and reducing climate impacts, the State should adopt a code which equitably maximizes access to charging while avoiding excessive construction costs.

Context

The State is taking significant steps to support the electrification of transportation, including Governor Newsom’s recent [Executive Order](#) (“EO”), calling for 100% of new vehicle sales to be zero-emission within 15 years. Advancing electrification holds significant benefits. A recent [report](#) from Next 10 outlined that by 2030 the use of EVs can increase the Gross State Product by approximately \$80B - \$140B, grow real income between \$310B - \$360B, and create 394,000 new jobs statewide.

As the State begins to implement the Governor’s EO, we must ensure that new market parameters avoid further disenfranchising low-income communities. Prior code cycles have been helpful in beginning to establish some additional electrical capacity to accommodate limited EV charging. However, the benefits of the added infrastructure are dependent on access

to that electrical capacity, and in California approximately [31%](#) of residents live in multifamily housing with little or no access to EV charging infrastructure. We believe greater consideration should be given to the equity impacts of the proposed 2022 Code updates and how more widespread EV adoption can be achieved by residents of multifamily housing.

2022 Code Recommendations

Balancing the need for increased access without unreasonable construction costs can be met by calibrating the energy capacity provided based on actual driver needs. With this in mind, we encourage the 2022 CALGreen code to provide the following updates and additions in multifamily dwellings:

Mandatory Measures

1. Elimination of prescribed 40-amp minimum power for each EV capable parking space and requirement of 10% of spaces as EV capable
2. Instead, provide one (1) EV capable parking space for every residential unit with a parking space, defined as:
 - a. Conduit from the panel to the space with the option for circuit sharing, and
 - b. A minimum of 1.4 kilowatt (“kW”) of electrical capacity dedicated to EV charging
3. Label every parking space with conduit as “Electric Vehicle Capable”
4. Explicitly encourage the use of a) advanced load management systems for Level 2 charging, and b) Level 1 charging
5. Allow EV Ready spaces to be defined as having an outlet but not prescribing EV Supply Equipment (“EVSE”)

Voluntary Measures

1. For voluntary tiers 1 and 2, encourage higher levels of EV capable, up to 100% of total parking spaces provided, through load managed Level 2 and Level 1 charging that provides a minimum of 1.4 kW of electrical capacity to each EV capable parking space

The above mandatory measures will enable a resident in any residential unit to readily deploy the “last leg” of EV charging for very modest added cost.

Rationale

Driver Need: The current paradigm in CALGreen of providing a minimum of 40 amps to each EV capable space doesn’t reflect actual charging behavior and is a hindrance to the future expansion of EVSE in multifamily dwellings. The average daily distance travelled in California is 24 miles¹. This data point is exemplified with San Francisco Bay Area vehicle miles travelled

¹ From 2018 California Public Road Data. The report indicates that 347 billion miles are travelled each year, divided by 39.5 million Californians, divided by 365 days yields roughly 24 miles per day.

("VMT") averaging [21 - 31 miles](#) per day (as of 2015) and Los Angeles County VMT averaging [22 miles](#) per day (as of 2017). 40-amp charging (e.g. Level 2) provides roughly [12-25 miles of range](#) per hour of charging. Therefore, an EV that plugs in at a multifamily dwelling will charge for about 1-2 hours at this rate and then sit for the rest of the evening, exemplifying how the current CALGreen requirements are oversized for this long-dwell parking use case. Level 1 charging provides 40-50+ miles per 10-hour overnight charge, more than enough to meet the daily charging needs of a majority of drivers. Given the high proportion of plug-in hybrids with more limited battery capacity, a 40-50+ mile overnight charge represents the upper limit of charging need and for EVs with higher range capacity, periodic topping off at direct current fast chargers ("DCFC") becomes a viable complement, when needed.

Hinders Adoption: The current requirements of providing EV capability to a minimum of 10% of spaces also hinders the widespread growth of EV adoption by providing charging access to too narrow a share of the residents in a multifamily dwelling. Most multifamily parking spaces are assigned, deeded, or otherwise incapable or inconvenient of being switched among tenants. Therefore, when only 10% of parking spaces are provided with charging access, EV adoption potential is dramatically limited, given that only the users of those parking spaces will be able to charge. Potential EV drivers not assigned to one of the EV-capable spaces will have no access at all not only because the spaces are not already EV-capable, but because incremental expansion for one more EV-capable space will be prohibitively expensive due to electrical capacity requirements. The typical cost of adding additional electrical capacity to the first non-EV-capable spot is usually between \$25,000 to \$50,000.

Equity: This is also a significant equity issue in that the current CALGreen requirement rewards early adopters of EVs, which will be assigned to the limited number of EV-capable spaces first and are more likely to be higher-income earners. Later potential EV consumers will in turn be hampered by the limited deployment of EVSE where they live unless their multifamily property owner performs increasingly expensive retrofits to add additional infrastructure, including additional costly electrical capacity upgrades. This will delay access to all Californians of the fuel-cost savings benefits that EVs provide.

Flexibility: Redefining "EV Capable" from a prescribed 40-amp minimum power level per electrified parking space to a 1.4 kW minimum electrical capacity to each electrified parking space provides multifamily housing developers flexibility on how EVSE can be accessible to all residents. Developers can choose from load-managed Level 2 charging in a variety of configurations and/or Level 1 charging to meet the 1.4 kW minimum in a method that makes most sense based on the property, housing type, etc. This flexibility is critical in deploying EVSE at scale while also avoiding unnecessarily burdensome electrical capacity upgrades.

Cost Effectiveness: More cost-effective charging solutions are needed to provide wider access to charging for new construction, such as Level 1 charging and energy management systems, to ensure all residents have access to the benefits of EVs. Providing charging access to all residents in a multifamily dwelling is vastly more cost-efficient during new construction than

<https://dot.ca.gov/-/media/dot-media/programs/research-innovation-system-information/documents/california-public-road-data/prd-2018-a11y.pdf>

retrofits under CALGreen's current requirements. An Energy Solutions [study](#) found that the incremental cost of adding power-managed Level 2 charging access to 25% of parking spaces and Level 1 charging access to 75% of parking spaces was under \$1,500 per unit. Furthermore, adding this level of charging in a future retrofit would cost 3 times as much as installing during new construction.

Load Management: Similarly, energy management systems, which balance power so as not to exceed electrical constraints, can be a useful tool in expanding EV charging access in a cost-effective manner. The current CALGreen requirement of a 40-amp minimum to each EV-capable space can be expanded to more ports with energy management while also meeting the daily needs for EV drivers. For instance, a single 40-amp connected port can provide roughly [7.2 kW](#) of output. An energy management system could allow 5 ports to be connected on the same circuit, share power equally among the 5 vehicles when fully utilized, and still provide each vehicle with a minimum of 1.4 kW, which meets the daily charging needs of the average driver, as demonstrated in the Level 1 charging example above. ***The use of energy management in this manner can take the current CALGreen requirement of 40-amp power per space and increase the number of EV charge ports five-fold while utilizing the same level of power already prescribed. Furthermore, since the 2022 CALGreen proposed update now includes a 20% minimum EV capable requirement, charging access to 100% of residents can now be achieved through the use of energy management and/or Level 1 charging without any increase in the overall electrical capacity.***

Moreover, advanced load management systems have been explicitly identified as an important strategy in other state initiatives and should similarly be reflected in this upcoming 2022 CALGreen update. For instance, the DRIVE OIR Vehicle-Grid Integration Working Group's [final policy recommendations database](#) includes several recommendations to include load management systems, including "2.04 Enable customer to elect [behind the meter] load balancing option to avoid primary or secondary upgrades...", "2.17 ... elect certified behind the meter load management technologies to avoid primary and/or secondary upgrades...", and "9.01 Optimize CALGreen codes for VGI and require more PEV-ready parking spaces and expand to existing buildings." Also, the CPUC's Proposed Decision [R.18-12-006](#) recommends the use of load management systems in future transportation electrification programs.

Current Usage of Low-Power Charging: The use of low-power charging for driving needs is not hypothetical. It is in fact in widespread use now for EV charging. A [report](#) by the California Air Resources Board shows that *over half* of all EV drivers are using Level 1 charging (either a standard outlet or Level 1 EVSE) to charge their vehicle. These data points are confirmed by internal research with EV drivers in Peninsula Clean Energy's service territory. While energy management systems are a newer method of providing EV charging, investor owned utilities ("IOU") that manage the transmission and distribution system in CCA service areas, have shown widespread usage of this technology. For example, through Pacific Gas and Electric's ("PG&E") EV Charge Network program, PG&E utilized this type of load management at

multifamily dwellings to reduce the average power needs per vehicle by 50%². Additionally, load management systems are authorized in the National Electric Code (Section 625.42) and can receive Underwriters Laboratories certification (UL 916) to ensure safety.

Local Codes: This approach in new construction policy is also already gaining adoption with local building “reach code” enhancements. For example, Peninsula Clean Energy and Silicon Valley Clean Energy’s [EV reach code](#) calls for 100% charging access (25% level 2 EV-capable and 75% Level 1 EV-capable). These codes (or local variants) have been adopted in a growing number of agencies in San Mateo and Santa Clara counties.

Conclusion

To help meet the state’s goals in accelerating EV adoption, the public agencies listed in this letter strongly encourage CALGreen to provide these updates in the 2022 code update. Specifically, expand beyond the mandatory 10% EV capable requirement in multifamily housing to instead provide *every* residential unit that has a parking space with access to a minimum of 1.4 kW to use for EV charging. We also encourage voluntary tiers to seek to provide charging access to 100% of parking spaces through Level 1 charging and/or energy management systems to help provide the critical infrastructure needed now to allow for the universal adoption of EVs over time. As indicated earlier, the proposed new mandatory measure in this code update calls for 20% of parking spaces to be EV capable, which can be increased to 100% of parking spaces through the use of load management and/or Level 1 charging without increasing electrical capacity.

Ensuring an equitable path towards 2035 is a goal shared by all our organizations, and we hope CALGreen will support this effort and consider more flexible and accessible updates. Thank you for the opportunity to provide comments. Should you have questions or would like to discuss in greater detail, please don’t hesitate to let us know.

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² As noted in Appendix D of this [report](#), though we believe that power management can be enhanced to further reduce average power needs, yielding capacity for additional ports than what has been demonstrated by the IOU in this example

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