



Independent Advice on Electric Vehicle Charging Systems

September 10, 2021

BUILDING STANDARDS COMMISSION
2525 Natomas Park Drive, Suite 130 Sacramento, California 95833-2936
Via Email: cbsc@dgs.ca.gov

RE: CALGreen New Construction, Electric Vehicle Infrastructure -- Recommendations from EV Charging Pros

Dear Building Standards Commissioners and Staff,

EV Charging Pros (EVCP) has been providing vendor neutral EV charging consulting services to commercial properties since 2011. We have focused on multifamily properties and our clients range from REITS and affordable housing developers to mom-and-pop owners of older 20-unit apartment complexes. EVCP has written reports on EV charging in apartments, established the Multifamily EV Charging advisory group, participated in Low Power Pilot project with Peninsula Clean Energy and currently is providing technical support for Marin Clean Energy EV charging incentive projects. EVCP is now managing over 100 active EV charging projects in California.

I am writing to provide my experienced perspective on the proposed 2023 Title 24 document. I have three significant technical concerns:

1) The CEC document [Electric Vehicle Charging Infrastructure Assessment - AB 2127](#), Jan 2021 states that CA needs 270,000 charging ports in multifamily properties to support vehicle sales goals by 2030. It specifically states in the Executive Summary page 2 that "In some cases Level 1 chargers may be sufficient at select multifamily dwellings". Yet the proposed Title 24 removes this possibility of 120V L1 charging from the building codes. **How can we meet the acknowledged need of multifamily properties if the building code does not allow the required solution?**

2) The HCD proposal requires "low power" to be 240V 20Amp. I want to point out that on a generic, empty, dedicated 100Amp panel there are significant differences in the number of potential ports based on a 120V vs 240V and 1p vs 3P panel schedule wiring diagrams. The "electrical math" detailed in the chart below shows that a much larger number EV's can be charged at 120V 15Amp and 20Amp. **We need to have 120V as a solution for a property owner to justify and scale a project from a power perspective. Otherwise, the ability to provide 270,000 charging ports will be severely compromised due to the additional electrical infrastructure and expense.**

Level	Output kW	Level Detail	Bus Rating	Can Wire
Outlet - 12A output 15A breaker	1.4	240 / 120V 1PH 3W	100 A	13
Outlet - 16A output 20A breaker	1.9	240 / 120V 1PH 3W	100 A	9
Low Power Level 2 EVSE - 16A output 20A breaker	3.8	240 / 120V 1PH 3W	110 A	4
Full Power Level 2 EVSE - 32A output 40A breaker	7.7	240 / 120V 1PH 3W	100 A	2
Outlet - 12A output 15A breaker	1.4	208Y / 120V 3PH 4W	100 A	19
Outlet - 16A output 20A breaker	1.9	208Y / 120V 3PH 4W	100 A	14
Low Power Level 2 EVSE - 16A output 20A breaker	3.3	208Y / 120V 3PH 4W	100 A	8
Full Power Level 2 EVSE - 32A output 40A breaker	6.7	208Y / 120V 3PH 4W	100 A	3

3) As an example, a building with 150 parking spaces would require 279KVA to provide charging infrastructure for 60 spaces under the proposed code, yet 100% of all spaces can be provided charging infrastructure with 288KVA. **My experience is that properties will be more than happy to embrace an electrical calculation at a 100% of spaces at 120V 20A definition and use automated load management and other technologies to provide a mix of charging levels for all parking spaces on the property in lieu of 60% less EV charging stations.**

Spaces in the Parking Lot EV Charging Required	150 Spaces Enables	KV	Total Amps @ 480V 3P	Total Amps @ 208V
100% Parking Spaces at LEVEL 1, 120 VOLT, 16 AMP 20 AMP BREAKER	150	288	347	800
40% Parking Spaces(CA 2023 T24) LEVEL 2, 208 VOLT, 32 AMP 40 AMP BREAKER	60	275	336	775

I respectfully ask you take these points into consideration. I want to make sure the building code enables properties to embrace EV charging, not recoil given a perceived lack of flexibility in both the electrical math calculation and/or the requirements for deploying specific charging levels that may not be appropriate for their site-specific use cases and business models.

Respectfully,



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