PROPOSED MODEL EV CHARGING REQUIREMENTS FOR MULTI-FAMILY PROJECTS, A MODEL FOR LOCAL JURISDICTION EV CHARGING REACH CODES

November 2022

Summary of CalGreen and EV Charging Requirements

California updates various building codes on a three year cycle, including general building requirements, energy, and "green" requirements. The "green" requirements are Title 24 Part 11, which is titled California Green Building Standards, but is better known as "CalGreen"[1]. CalGreen includes EV charging infrastructure requirements. Local jurisdictions must either adopt state codes, or they may adopt alternative code language/requirements as long as the state approves the alternate code language as being of equal or greater stringency as compared to the state code. According to sources[2], local jurisdictions may adopt changes to EV charging requirements at any time, rather than only in line with the 3 year building code cycle (this is important because all of the 2022 building codes become effective on 1/1/23, and there may not be adequate time for some jurisdictions to design and adopt changes to CalGreen prior to the end of this year).

For new multi-family projects, 2019 CalGreen only required electrical provisions for a certain number of parking spaces; full charging capability was not required. In a major advance, the 2022 CalGreen code requires full charging infrastructure, although at less than half of new multi-family project parking spaces. 350 Contra Costa believes that CalTran's provisions do not provide for the amount of charging infrastructure necessary to meet the growing need for home EV charging.

EV Charging Technology

Charging Levels:

- Level 1 (120 V) Capability: 3 – 5 range miles per charging hour. For example, charging from 9pm to 7am (10 hours), the expected added range would be 30 – 50 miles.
- Level 2 (240 V) Capability: 10 – 50 range miles per charging hour (although usually not more than around 40 range miles / hour). Charging from 9pm to 7am (10 hours), the expected added range would be 100 to 500 miles. Note: the wide miles range is due to various voltage choices available; higher voltage = faster charging, higher installation cost, and greater peak load. CalGreen calls for "low power", which is 20 amps.
- Level 3, also known as DC Fast Charging. This technology is designed for quick charging on long highway trips. Level 3 charging is not considered appropriate for long-term parking areas where people live or work – i.e. residential, commercial and institutional facilities.

1 2022 CalGreen https://up.codes/viewer/california/ca-green-code-2022

2 Jason Crapo, Contra Costa County Building Official,10/25/22, and Bay Area Reach Codes https://bayareareachcodes.org/

Charging Connections:

- "Charging Station": This is a module, either free-standing or wall-mounted, that includes one or two cables with connector plugs at the end(s) which plug into an EV in order to transfer power. Charging stations are only used at Level 2 and Level 3 charging facilities.
- Standard Electrical Receptacle: These can be 120 volt, as typically found inside homes and office buildings. There are also 240V receptacles, as used for special loads (such as for electric stoves, electric clothes dryers, and heat pump water heaters).
- Cords for Standard Receptacles: Every EV comes with a 120V cord with plug. Therefore, every EV can charge at a standard 120V receptacle, which single family residential garages are equipped with. However, most EV manufactures are now either equipping their EV's with, or making available, charging cords that will do both 120V and 240V (accomplished with interchangeable plugs)[3].

Terminology Used in CalGreen

- EV **Capable** Space: Parking space where basic electric service is provided that can serve a future EV charging cable or receptacle.
- EV **Ready** Space: Parking space that is fully ready to charge an EV (i.e. the electrical infrastructure includes a cable with plug, or a receptacle).
- EV **Charger**: Same as "Charging Station", as defined above under Charging Connections.

Various Jurisdictions Alternative EV Charging Requirements

NEW MULTI-FAMILY, LESS THAN 20 DWELLING UNITS (D.U.s)

Code / Jurisdiction	Ready Level 2	Chargers Level 2	Capable Level 2	Ready Level 1
CalGreen	25%	0%	10%	n/a
Contra Costa County - draft[4]	25%	5%	10%	n/a
Lafayette[5]	25%	0%	10%	65%
Marin County[6]	85%	15%	n/a	n/a

3 According to manufacturers' websites, Ford, Chevrolet and Tesla EV's either come with 120/240 cords, or such cords are available from the manufacture. 120/240 volt cords are also available for the Nissan Leaf. Other EV makes were not checked.

4 Contra Costa draft EV charging requirements: http://64.166.146.245/agenda_publish.cfm?id=&mt=ALL&get_month=10&get_year=2022&dsp=agm&seq=51268&rev=0&ag=2050&ln=103770&nseq=51286&nrev=0&pseq=&prev=#ReturnTo103770

5 Lafayette draft EV charging requirements: https://lafayette.granicus.com/MetaViewer.php?view_id=&event_id=1121&meta_id=157170 The city council approved this proposal Oct. 2022, and it will go into effect 1/1/23.

6 Marin County draft EV charging requirements: https://marin.granicus.com/MetaViewer.php?view_id=33&event_id=3104&meta_id=1224526

NEW MULTI-FAMILY, 20 AND MORE DWELLING UNITS

Code / Jurisdiction	Ready Level 2	Chargers Level 2	Capable Level 2	Ready Level 1
CalGreen	25%	5%	10%	n/a
Contra Costa County - draft	25%	5%	10%	n/a
Lafayette, draft	25%	5%	10%	60%
Marin County	85%	15%	n/a	n/a

Multi-Family table notes:

1. For all codes listed above, the percentage applies to the number of D.U.s provided with parking
2. CalGreen Residential EV charging requirements are listed at Chapter 4 Division 4.1 Planning & Design

Proposed EV Charging Requirements

CalGreen is all about Level 2 charging. Our research shows that for most drivers, overnight Level 1 charging would provide adequate range miles for their average daily use. And 2022 CalGreen only addresses less than 50% of multi-family dwelling parking spaces. We are very concerned that if the basic electric infrastructure is not provided at the time of initial project construction, there will be resistance and high costs to retrofitting future EV charging receptacles or charging stations. On the other hand, while Lafayette and Marin County are suggesting that every dwelling have Ready charging at a parking space for each dwelling when projects are initially constructed, we do not believe it necessary for projects to include the full cost of Ready charging at initial construction, when it will be years before a majority of residents are driving EVs.

We did consider an option that would allow 100% of the dwelling parking charging to be Level One, plus a modest number of Level 2 charging stations – for those that need the occasional quicker charging. Benefits: Lower installation cost, lower impact on electric grid. But although it was felt that this type of standard might meet the intent of CalGreen's charging requirements, we did not feel comfortable offering a charging plan that may not win State acceptance as "equal or better". That said, if any local jurisdictions wish to explore this option, we would wholeheartedly support this approach. It would be useful to get real world information on implementing and operating under this scheme.

Our proposed model EV charging code takes the following approach:

1. CalGreen requirements for Ready charging (with an exception noted below), plus for quantity of parking spaces equal to the total number of dwellings, for every space that is not Ready, it shall be Capable.
2. Capable spaces can be either Level 1 or Level 2.
3. We do not find a rational for dweller's parking spaces to have Chargers. Therefore, for the charging requirements for 20 and greater dwelling units, we add the 5% Charger requirement to the 25% Ready requirement, thus changing the Ready requirement from 25% to 30%. Note that owners always have the option of installing chargers instead of receptacles if they so wish.
4. Chargers (charging stations) are practical at unassigned parking. This is especially true if they are networked charging stations, where users would be notified by a smartphone app when the charging is complete. CalGreen requires one charger at unassigned parking, only at 20 and more dwelling unit projects. The common parking single charger requirement is regardless of

project size! Our proposal includes an unassigned parking charger requirement that scales with project size.

NEW MULTI-FAMILY, LESS THAN 20 DWELLING UNITS (D.U.s)

Ready	Capable	additional requirement
25% Level 2	75% Level 1 or Level 2	One Level 2 charging station located in an unassigned parking space. Charging stations to be tied to an app that notifies users when charging is complete. Note: Given the small size of these projects, jurisdictions may elect to not include this requirement. Or perhaps make it applicable only for projects with a certain number of dwellings, such as 15. Or only make it applicable when the Capable charging is Level 1.

NEW MULTI-FAMILY, 20 AND MORE DWELLING UNITS

Ready	Capable	additional requirement
30%[7] Level 2	70% Level 1 or Level 2	One Level 2 Ready charging station per 20 D.U.'s, located in an unassigned parking space. Required quantity rounded up to next full number. Charging stations to be tied to an app that notifies users when charging is complete.

NEW MULTI-FAMILY, FUTURE CONVERSION OF CAPABLE SPACES TO READY SPACES

We recommend that EV charging ordinances include language which governs availability of charging for projects that are built with a combination of Ready and Capable spaces. This provision would regulate the timing of providing additional Ready charging when the initial Ready spaces are all in regular use. This might take the form of property owners being given a certain time period – perhaps one or two months – from written notification that a resident whose dwelling does not have access to Ready charging is in need of same.

Proposed EV charging notes:

1. For multi-family, percentages apply to the number of D.U.s that are provided with parking.
2. Where Level 1 Capable is listed, Level 2 may be provided instead.
3. Level 2 is "low-power" 20 amp 240 volt, to match CalGreen's Level 2 specifications.
4. CalGreen requirements not addressed here, such as accessibility, dimensions, and labeling, should be made part of the jurisdiction's EV charging plan.

EV CHARGING AT OTHER TYPES OF PROPERTIES AND PROJECTS

Multi-Family Parking Additions and Alterations. While we are concerned about the very minor charging infrastructure requirement contained in CalGreen, we are also apprehensive about the impact of EV charging infrastructure costs on multi-family dwellers. We urge local jurisdictions to monitor EV charging needs among existing multi-family dwellers. However, charging demand (EV owners) may not become very plentiful until such time as there is convenient charging infrastructure available at people's own parking areas. Therefore, it will be vital for local jurisdictions to monitor state and federal funding opportunities for EV charging retrofits, and encourage multi-family property owners to install chargers or receptacles. Consideration will need to be made whether it is more practical to provide Level 1 receptacles at assigned parking, Level 2 receptacles at assigned parking, or networked charging stations at unassigned spaces.

7 30% is derived from CalGreen's 25% plus 5% requirement. See point 3 in the description of our proposal, directly above the proposed requirements tables.

Nonresidential Parking – at both new construction and at existing facilities. As with multi-family parking additions and alterations, the CalGreen requirements for new building parking, and for parking additions and alterations, calls for charging infrastructure at a small percentage of parking spaces. However, it is not clear at this early stage of the transition from ICE to electric vehicles how much charging will be done at home, and how much demand there will be for charging at workplaces. As with existing multi-family homes, it will be vital for local jurisdictions to gauge EV charging demand at nonresidential properties, monitor state and federal funding opportunities for EV charging retrofits, and encourage property owners to install charging stations when demand dictates. In the future, there may be a need locally to adopt nonresidential charging requirements that exceed CalGreen requirements.

Please address questions and requests for additional information to Gary Farber garyf8642@gmail.com or Lisa Jackson 67jacksonl@gmail.com , members of 350 Contra Costa Action - Local Climate Policy Team