



June 6, 2011

California Building Standards Commission,
2525 Natomas Park Drive, Suite 130
Sacramento, California 95833
Attention: Dave Walls, Executive Director
CBSC@dgs.ca.gov

Dear Mr. Walls:

This letter comprises the comments of the Pacific Gas and Electric Company (PG&E) in response to the Department of Housing and Community Development (HCD) Express Terms for Proposed Building Standards Regarding Amendments to CALGreen, 2010; dated April 21, 2011 and excerpted on page four of this letter.

PG&E understands the future role electric vehicles (EVs) will play in reducing transportation impacts on local air quality and greenhouse gas (GHG) emissions in the state. For example, a California Energy Commission (CEC) Full Fuel Cycle Assessment (2007) estimates plug-in hybrids offer a 48% reduction in GHG emissions and over 50% reduction in NO_x emissions relative to petroleum fueled vehicles in California. The state outlined GHG emissions reductions goals in Assembly Bill 32, which calls for 1990 levels by 2020 and 80% below 1990 levels by 2050. Assembly Bill 118 (AB 118) provides incentive funding for alternative fuel vehicles and states that “plug-in hybrid and battery electric vehicles are essential to California’s low carbon transportation future.”

To date, EVs have not achieved significant market penetration in part due to lack of widespread charging infrastructure. It is estimated that initially most vehicle charging will be done at home and most consumers will prefer the convenience of what is known as Level 2 charging, which requires a dedicated 240 volt circuit in the garage. Provisioning a dedicated EV charging circuit, including circuit breaker and wiring, during residential new construction would add minimal cost, while the retrofit cost for a residential charging circuit can be \$1,500 to over \$3,000. As major automakers begin to roll out production EV models, readily available residential charging infrastructure could help to increase market penetration of EVs.

Residential EV charging may eventually be commonplace in California homes, so we believe the voluntary provisions for EV charging infrastructure in the April 21 Express Terms are a positive development in CALGreen. We applaud HCD for including Section A4.106.6 in the Express Terms, which would provide local jurisdictions with a very suitable set of requirements for EV charging readiness for their building standards. The provisions would help such jurisdictions prepare their communities for future electric transportation options and avoid expensive retrofit requirements for residences without appropriate charging infrastructure.

Some concern has been expressed over whether the amperage required in the voluntary measure for the Level 2 charging circuit is adequate for EV charging. The Level 2 charging definition covers 240 volt service up to 80 amps, but we believe that a 40 amp circuit will be sufficient for overnight charging for almost all EV cases now and in the foreseeable future. In exceptional situations where a customer needs to charge daily at a higher rate, for a high - end electric sports car for example, that customer would be responsible for implementing the circuit upgrade.

The question has also been raised as to whether reserving 40 amp capacity on the electric panel for EVs might require an upgrade in single-family residential panel size from 200 amps to 400 amps. We believe that such cases will also be the rare exception and that based on typical residential loads, a 400 amp panel will not be necessary due to a single 40 amp EV charging circuit. Residential load calculations should account for load diversity and reasonable lighting, appliance, and HVAC wattages in order to size service panels.

We also appreciate the opportunity to provide comments on the language in HCD's Express Terms, dated April 21, 2011. We support the April 21 language with the following modifications, rather than the June 1 revision that does not include any pre-wiring, breakers and capacity reservation for the provisioned EV charging circuits.

1. Issue relating to conduit in single-family residential construction

Regarding Section A4.106.6.1 *Dedicated electric vehicle supply equipment circuit*, we believe the term conduit should be removed from the language, as conduit is often not used in single family residential construction and the proposed language is therefore unnecessarily prescriptive as to the manner of construction.

A4.106.6.1 Dedicated electric vehicle supply equipment circuit. For each single-family residence, circuit breaker(s), ~~conduit~~ and wiring for a 240VAC, 40 amp dedicated circuit shall be installed from the residence service panel and terminate within 5 feet of a residence's parking area (garage, carport, driveway), to accommodate the future installation of residential electric vehicle supply equipment.

2. Issue relating to dedicated circuits and reserved stalls in multi-family residential construction

We believe the proposed provision for charging circuit wiring in multi-family residential construction would be strengthened by specifically including the term 'wiring' in the language so that the requirement is not ambiguous as to whether or not wiring is required. Currently the provision states that circuit breakers, conduit, and dedicated circuit are required, but it is not clear whether or not a 'dedicated circuit' includes wiring or if empty conduit / raceway is sufficient.

We also feel it is not necessary in this section to refer to the stalls that are equipped with electric vehicle charging circuits as 'reserved stalls' as this may be construed to mean that only electric vehicles can park at these stalls, even if electric vehicle supply equipment has not yet been installed on the charging circuits and/or no electric vehicle owners occupy the building.

A4.106.6.2 Electric vehicle parking stalls in multi-family residences. For parking stalls in shared parking areas that are for use by owners or occupants of multi-family dwelling units, ten percent (10%) of all parking stalls, rounded up to the nearest whole number, shall have the capability for supporting electric vehicle supply equipment.

To accommodate electric vehicle charging at electric vehicle parking stalls, at a minimum, circuit breakers, conduit, wiring and dedicated circuit for 208/240VAC, 40 amp shall be installed from the electric service panel to each electric vehicle parking stall. Each circuit shall terminate within five feet of each electric vehicle parking stall. The electric service panel shall have sufficient capacity for simultaneous charging at full rated amperage of electrical vehicles at each ~~reserved~~ electric vehicle parking stall.

3. Issue relating to labeling requirement

Sections A4.106.6.1 and A4.106.6.2 both currently contain labeling requirements so that the electric vehicle charging infrastructure is clearly identifiable. We agree that this is important, but believe the required label should not read “EV Ready” as that may be misleading to residents. The electric vehicle charging circuit itself is not sufficient to charge a vehicle, as electric vehicle supply equipment must be installed in order to deliver electric power from the circuit to an electric vehicle. Therefore we propose the more accurate label “Electric Vehicle Charging Circuit.”

A4.106.6.1.1 Labeling requirement. At the service panel and receptacle, a label shall be provided as follows: "~~EV READY.~~" "Electric Vehicle Charging Circuit."

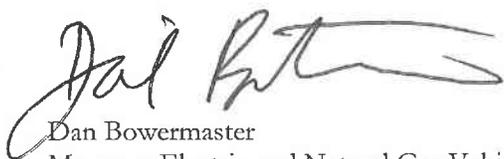
A4.106.6.2.1 Labeling requirement. At the service panel and parking stall, a label shall be provided as follows: "~~EV READY.~~" "Electric Vehicle Charging Circuit."

4. *Inclusion of note regarding consulting utilities*

We appreciate HCD’s recognition of the importance of consulting utilities with respect to electric vehicle metering requirements and support the proposed note included in Sections A4.106.6.1 and A4.106.6.2, that states that “utilities may have additional options related to supply metering and should be consulted prior to installation.”

Again, thank you for the opportunity to provide comments.

Sincerely,



Dan Bowermaster
Manager, Electric and Natural Gas Vehicles
Customer Energy Solutions
Pacific Gas and Electric Company

25-A. HCD proposes to adopt Section A4.106.6 of Appendix A4 as follows:

A4.106.6. Electric vehicle charging. Provide facilities meeting Section 406.7 (Electric Vehicle) of the California Building Code and as follows:

A4.106.6.1 Dedicated electric vehicle supply equipment circuit. For each single-family residence, circuit breaker(s), conduit and wiring for a 240VAC, 40 amp dedicated circuit shall be installed from the residence service panel and terminate within 5 feet of a residence's parking area (garage, carport, driveway), to accommodate the future installation of residential electric vehicle supply equipment.

Note: Utilities may have additional options related to supply metering and should be consulted prior to installation.

A4.106.6.1.1 Labeling requirement. At the service panel and receptacle, a label shall be provided as follows: "EV READY."

A4.106.6.2 Electric vehicle parking stalls in multi-family residences. For parking stalls in shared parking areas that are for use by owners or occupants of multi-family dwelling units, ten percent (10%) of all parking stalls, rounded up to the nearest whole number, shall have the capability for supporting electric vehicle supply equipment.

To accommodate electric vehicle charging at electric vehicle parking stalls, at a minimum, circuit breakers, conduit and dedicated circuit for 208/240VAC, 40 amp shall be installed from the electric service panel to each electric vehicle parking stall. Each circuit shall terminate within five feet of each electric vehicle parking stall. The electric service panel shall have sufficient capacity for simultaneous charging at full rated amperage of electrical vehicles at each reserved stall.

Note: Utilities may have additional options related to supply metering and should be consulted prior to installation.

A4.106.6.2.1 Labeling requirement. At the service panel and parking stall, a label shall be provided as follows: "EV READY."

NOTE: Authority cited: Health and Safety Code Sections 17921, 17922 and 19990. Reference: Health and Safety Code Sections 17000 through 17060, 17910 through 17990 and 19960 through 19997.