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HCD Comments
Draft 2013, Title 24, Part 11, Green Building Standards
Proposed by the California Energy Commission

The Department of Housing and Community Development appreciates the opportunity to comment on the California Energy Commission's draft 2013 CALGreen proposal. We recognize that the proposed text for CALGreen Appendix A4, Division A4.2 – Energy Efficiency, is still in the development stages, however, we would like to comment on several areas for further evaluation and clarification. We would also like to include comments on proposed text for CALGreen Appendix A5, Division A4.5 – Energy Efficiency, due to its application to high-rise residential, hotels and motels.

General Comments

1. The Tier I and Tier 2 headings and requirements should be moved above the prerequisites to clarify that compliance with all prerequisites are required for each tier.

2. The tiers should be labeled as "Tier 1" and "Tier 2" for consistency with other tiers in CALGreen.

3. CALGreen's tier framework involves enhanced sustainable practices for; planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency and environmental quality. In order to encourage and support local adoption of enhanced Tier 1 measures it is important that the measures are practical to implement and cost effective.

   The prerequisites proposed for the A4.2 tiers, in lieu of choices for a required number of electives, should be evaluated to ensure that they are able to be implemented and that all resources, including compliance computer program(s), are available and of reasonable cost for implementation. It is important that the tier requirements in Division A4.2 (and Division A5.2 for residential) not discourage the adoption of other sustainable building measures, e.g., increased waste reduction requirements, in other portions of CALGreen.

   Similar to the process for other code adoption cycles, HCD relies on comments from stakeholders and subject matter experts to ensure that code proposals are clear and enforceable and do not negatively impact affordable and safe housing. We will be closely evaluating comments received on the tier requirements and prerequisites to ensure that the tiers, especially Tier 1 are capable of implementation, enforceable, and do not impose financial hardships on builders or future building owners.

Specific Comments:

A4.203.2 Performance standard for new low-rise residential

1. The proposed Appendix A4, Division A4.2, identifies an electrical consumption threshold of 10,000 kWh for Tier 1. If a proposed building design level indicates that the threshold will be exceeded, additional energy efficiency measures or an on-site solar electric system will be required to reduce the usage to the threshold level. The threshold level of 10,000 kWh (Tier 1) and 8,500 kWh (Tier 2) appear to address single family residences of unspecified size. Are the tiers being modified to address multifamily residences or are multifamily residences not subject to the electrical consumption thresholds and related requirements?

2. The proposed threshold level, 10,000 kWh in the case of Tier 1, needs to be clarified in several areas for purposes of evaluation for inclusion in the code.

   Loads:

   - What loads are being considered in the allowance of the 10,000 kWh threshold?
   - How will the size of the building (an important factor for calculating general lighting and receptacle loads) be taken into consideration?
   - Special appliance loads (such as range and dryer) and fixed-in-place appliances (such as dishwashers, microwaves, garbage disposers, spas, etc.) are not required to be installed prior to the final inspection; how will those electrical loads be calculated?
   - The time the electrical appliances are being used is not regulated by any code. How will the consumption (kilowatts multiplied by hours) be calculated?

   Electrical vehicle usage and charging:

   - Electrical vehicles and associated electrical vehicle supply equipment (EVSE or chargers), if used every day, will be a significant user/consumer of electricity in residential buildings. Of particular concern, is whether the requirements for additional energy efficiency measures or solar electric systems will be triggered by the electrical consumption related to EVSE. Are any compensations or trade-offs available for supporting other sustainable products such as when supporting equipment for electrical vehicle use is installed?
   - Section A4.106.6 (an existing elective measure) provides an economical method for the future installation of EVSE which does not require advanced load calculations or expensive service panel upgrades. This regulation was adopted in response to requests from the California Air Resources Board and external stakeholders to provide the means to reduce costs associated with future installation of electric vehicle charging stations (EVSE). Additionally, the provisions of this regulation are intended to help reduce use of natural resources, lead to the reduction of greenhouse gases and provide readiness for consumer acceptance and use of electrically powered vehicles. However,

the CEC proposal, in its current form, may dissuade or provide a disincentive for use of electric vehicles by requiring additional costs related to installation of a solar photovoltaic (PV) system or other energy efficiencies.

- HCD has completed a simplistic analysis of potential loads for residential buildings and particularly those with EVSE. This calculations which consider average consumptions based on data from the U.S. Energy Information Administration as well as an sample single-family home demonstrate that the proposed 10,000 kWh threshold may easily be exceeded when EVSE are included in the loads. These calculations are shown in Attachment A.

A4.203.1 Prerequisites for Tier 1 and Tier 2 new low-rise residential

Requiring vacancy sensors on all permanently installed lighting is an additional cost, and perhaps more importantly may go a little too far (intrude) on the rights of people to set their lighting as desired and for those lights to stay on while they are away from the home for an hour or two, or in the room sleeping, or watching TV but not moving. Should regulations control and even interfere with how people use the lighting in their homes?

Additions and alterations to low-rise residential buildings

1. The 2010 California Energy Code provides the following definition for alteration:

> **ALTERATION** is any change to a building's water-heating system, space-conditioning system, lighting system or envelope that is not an addition. Alteration is also any change that is regulated by Part 6 to an outdoor lighting system that is not an addition. Alteration is also any change that is regulated by Part 6 to signs located either indoors or outdoors.

   Does the CEC definition of "alteration" apply to the proposed tier levels for additions and alterations? For example, would replacement of a water heater without any change in structure area, volume or size require compliance with a 5 percent lower energy budget based on the entire existing building?

   The use of alteration may need clarification to apply to alterations that increase the building's area, volume or size. If not, a separate definition for alteration may need to be provided for this section. This will avoid inconsistencies with the definition of alteration in Section 301.1.1.

2. The tier provisions for additions and alterations need clarification on what the energy reductions would be based on. For example, is it based on the entire structure including the area of addition/alteration or only the added/altered portion of the structure?

3. The performance standards for Tiers 1 and 2 reference a required reduction in the Energy Budget for each mechanical system altered and identifies the systems are heating, space cooling and water heating systems.

   The language in Tier 2 needs to be modified to reflect the associated 5 percent reduction for each system similar to the Tier 1 language.

   Heating and cooling systems are commonly combined in smaller residential applications. In these cases would the systems be considered a single system (5 percent reduction) or as two systems (10 percent reduction)?

Specific Comments

A5.2 Energy Efficiency – nonresidential, high-rise residential, and hotel/motel

1. The proposed language for Appendix A4, Division A4.2; and Appendix A5, Division 5.2, both cover residential structures. Although the separation of high-rise residential and hotel/motel buildings from low-rise residential is the convention in the California Energy Code, CALGreen separates the residential which includes hotels and motels (and high-rise for 2013) in the residential sections. The inclusion of residential requirements in Appendix A5, Division A5.2 may be confusing to users.

   HCD recommends that the hotel, motel and high-rise residential requirements be moved to Division A4.2 to reflect the separation of CALGreen's residential and non-residential provisions.

2. Insert section numbering similar to Division A4.2.

Attachment A

Examples of residential buildings with and without electrical vehicle and charging needs

Single family home with Electrical vehicle supply equipment (EVSE) installed

- The average monthly residential consumption of electricity in California for 2010 is 562 kWh (data provided by the U.S. Energy Information Administration).
- Based on this data, the average annual consumption in California for 2010 can be calculated as: 12 (months) x 562 kWh = 6,744 kWh
- As an example, the new Nissan Leaf has 24 kWh battery pack. If the vehicle is charged every day, the electrical consumption (of the EVSE only) would be:
  365 (days) x 24 kWh = 8,760 kWh per year
- The annual consumption can be calculated as:
  6,744 kWh + 8760 kWh = 15504 kWh per year
- If the same vehicle is charged every other day, the consumption (of the EVSE only) would be:
  182 (days) x 24 kWh = 4,368 kWh per year
- In this case the annual consumption can be calculated as:
  6,744 kWh + 4,368 kWh = 11,112 kWh per year
- Compared to the proposed allowable consumption per year (10,000 kWh), the installation of EVSE in a single-family home will exceed the Tier 1 and Tier 2 thresholds, and will require additional energy efficiency measures or an on-site solar electric system, which would be an additional expense.

Single family home with electrical appliances (no EVSE is installed)

- Allowed consumption per year: 10,000 kWh
- Allowed consumption per day: 10,000 kWh ÷ 365 (days) = 27.4 kWh per day
- **Estimated household consumption in urban areas:**

Appliance	Use per day (hours)		Load (kW)	Consumption per day (kWh)
Dryer	1	x	5	5
Clothes washer	1	x	1.5	1.5
Range	0.5 (30 minutes)	x	10	5
Microwave	0.2 (10 minutes)	x	1.3	0.26
Dishwasher	1	x	1.5	1.5
Garbage Disp.	0.2 (10 minutes)	x	1	0.2
AC	8	x	1.8	14.4
Freezer	10	x	0.5	5
Total estimated consumption per day:				**32.86 kWh**
Total estimated consumption per year:				**11,993.9 kWh**
Not included in calculations: Outdoor and indoor lighting, general receptacle loads, kitchen receptacle loads, electronics, spas and swimming pools, etc.				

- **Compared to the allowable consumption per year (10,000 kWh), additional energy efficiency measures or on-site solar electric system MAY be required for single family homes equipped with electrical appliances (without EVSE installed).**

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