2013 Building Energy Efficiency Standards Staff Workshop

Solar Ready Single Family Residences

California Energy Commission

May 24, 2011

Background

- Proposal sponsored by the California Statewide Utilities Codes and Standards Program as a Codes and Standards Enhancement (CASE) study

- CASE study author Jon Roberts, CTG Energetics

- Presented at stakeholder meetings:

  2010: April 29, November 2

  2011: January 11, April 6, May 13

Proposed Code Language

Section 101– Definitions and Rules of Construction

SOLAR ZONE is a section of the roof that has been specifically designated and reserved for the future installation of a rooftop solar photovoltaic system, solar water heating system, and/or other solar energy system.

Proposed Code Language

SUBCHAPTER 7 (LOW-RISE RESIDENTIAL BUILDINGS – MANDATORY FEATURES AND DEVICES)

SECTION 150 – MANDATORY FEATURES AND DEVICES

(q) Solar Readiness – Single family residences shall provide for the future installation of a rooftop solar photovoltaic system, solar water heating system, and/or other solar energy system. The building plans shall show an allocated solar zone and the pathway for interconnecting the solar energy system with the building's electrical or plumbing system.

Note: *This proposal is meant for newly constructed single family residences. Additional language will be developed for Section 152 that excludes additions and alterations except in the case of a single family residence with an existing solar zone.*

Proposed Code Language

150(q) continued

Exception 1 to Section 150(q). A single family residence where it can be documented that there is no viable solar zone due to shading on the south facing, east facing, and west facing roof exposures which reduces the annual incident solar radiation by 30% or greater.

Proposed Code Language

150(q) continued

1. **Allocated Solar Zone**
   A. **Minimum Area and Orientation**. The rooftop solar zone shall meet the minimum area requirements shown in Table 150-A. The solar zone shall be oriented between 150° to 270°. This area can be divided into noncontiguous sections, the smallest section having an area of no less than 80 square feet. Both sections of the solar zone shall meet the orientation requirements.

Proposed Code Language

150(q) continued

TABLE 150-A SOLAR ZONE MINIMUM AREA REQUIREMENTS

Number of Stories	Total Area of Building Footprint	Solar Zone Area Requirement (ft^2)
1	All	250
2	All	250
3	$\leq$ 2,000 ft^2	150
	> 2,000 ft^2	250

Proposed Code Language

150(q)(1)(A) continued

Exception 1 to Section 150(q)(1)(A). For single family residences which cannot meet the solar zone orientation requirement due to lot orientation or roof configuration, the allowable orientation range can be extended from 150° to 90°. The solar zone area requirement shall be increased by 20%.

Exception 2 to Section 150(q)(1)(A). The area of a rooftop solar photovoltaic system, solar water heating system, and/or other solar energy system installed at the time of construction shall be counted as part of the solar zone area requirement.

Proposed Code Language

150(q)(1) continued

B. Roof Obstructions. The solar zone shall be kept clear of attic vents, plumbing vents, equipment, and other obstructions.

C. Shading. Any vent, chimney, architectural feature, mechanical equipment or other obstruction shall be located at a minimum distance from the solar zone that is two times the height difference of the obstruction and lowest point of the solar zone.

Exception 1 to Section 150(q)(1)(C): Any obstruction within 45 degrees of true north of the solar zone, including 45°00'00" east of north (NE), but excluding 45°00'00" west of north (NW) shall be exempt from the minimum shading requirement.

Proposed Code Language

150(q)(1) continued

D. Location of Solar Zone. The location of the solar zone shall be in compliance with Section 2 of the California Department of Forestry and Fire Protection Office of the State Fire Marshal Solar Photovoltaic Installation Guideline (Final Draft, dated April 22, 2008.

Note:

The 2012 International Fire Code (2012 IFC) includes requirements based on the California State Fire Marshal guideline. It is anticipated that the 2012 IFC will become the basis for 2013 California Fire Code (Title 24, Part 9) updates and that this reference will be updated to the appropriate sections of the 2013 California Fire Code.

Proposed Code Language

150(q) continued

E. Structural Integrity. The as-designed roof dead load and live load for the solar zone shall be clearly marked on the building plans.

2. Interconnection Pathways

A. The building plans shall indicate a pathway for routing of conduit from the solar zone to the electrical panel. The documented pathway may run on the interior or exterior of the building.

B. The building plans shall indicate a pathway for routing plumbing from the dedicated solar zone to the water heater location. The documented pathway may run on the interior or exterior of the building.

Proposed Code Language

150(q) continued

3. **Documentation.** A copy of the building plans or comparable document showing the information required in 150(q)(1) and 150(q)(2) shall be left for the homeowner's reference.

4. **Electric Panel Capacity**

   A. Electric panel capacity shall have a minimum a busbar rating of 200 amps.

   B. The electric panel shall have reserved space for the future installation of a double pole circuit breaker for a solar photovoltaic installation.

Proposed Code Language

150(q)(4)(B) continued

1. **Location.** The reserved space shall be positioned at the opposite (load) end from the input feeder location or main circuit location.
2. **Marking.** The reserved space shall be permanently marked as “For Future PV”.

2013 Standards Update

Send related comments by May 31, 2011 to:

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