

DOCKET

09-SOPR-1

DATE _____

RECD. SEP 27 2010

California Energy Commission
STAFF REPORT



SOLAR OFFSET PROGRAM
PRE-RULEMAKING
DRAFT REGULATIONS

SEPTEMBER 2010

CEC-300-2010-009-SF

CALIFORNIA ENERGY COMMISSION

Sherrill Neidich
Anthony Ng
Primary Author(s)

Sherrill Neidich
Project Manager

Tony Goncalves
Office Manager
Renewable Energy Office

Valerie Hall
Deputy Director
Efficiency and Renewable Energy Division

Melissa Jones
Executive Director

DISCLAIMER

Staff members of the California Energy Commission prepared this report. As such, it does not necessarily represent the views of the Energy Commission, its employees, or the State of California. The Energy Commission, the State of California, its employees, contractors and subcontractors make no warrant, express or implied, and assume no legal liability for the information in this report; nor does any party represent that the uses of this information will not infringe upon privately owned rights. This report has not been approved or disapproved by the Energy Commission nor has the Commission passed upon the accuracy or adequacy of the information in this report.

ACKNOWLEDGEMENTS

The Solar Offset Program Pre-Rulemaking Draft Regulations staff report was prepared with contributions from the following California Energy Commission staff.

Tony Goncalves
Valerie Hall
Gabe Herrera
Jonathan Knapp
Sandy Miller
Payam Narvand
Farakh Nasim
Bill Pennington
Patrick Saxton

ABSTRACT

Public Resources Code Section 25405.5, enacted by Senate Bill 1 (Murray, Chapter 132, Statutes of 2006), directs the California Energy Commission to develop regulations to govern the requirements for alternatives to offering solar energy systems as an option for new production homes and to develop a solar offset program.

On January 13, 2010, the Energy Commission approved an Order Instituting Rulemaking (Docket # 09-SOPR-1) to adopt guidelines, definitions, and other provisions necessary for the administration of the homebuyer solar option and solar offset program. This rulemaking shall develop and adopt regulations that are necessary to clarify ambiguities in statute and create certainty and transparency in the administration of the program.

In May 2010, staff developed a paper titled *Solar Offset Program Pre-Rulemaking*, which presented issues and possible alternatives that were raised by Energy Commission staff and stakeholders. Staff conducted a workshop on May 20, 2010 to discuss the issues and proposed solutions outlined in the staff paper and to seek comments from interested stakeholders.

This report presents proposed draft regulations to be considered as part of this pre-rulemaking process for both the Homebuyer Solar Option offer and Solar Offset Program.

Keywords: Senate Bill 1, Solar Offset Program, Homebuyer Solar Option, Public Resources Code Section 25405.5, Rulemaking, Renewables Committee, solar photovoltaic

Neidich, Sherrill, Anthony Ng. 2010. *Solar Offset Program Pre-Rulemaking Draft Regulations*. California Energy Commission, Energy Efficiency and Renewable Energy Office. Publication number: CEC-300-2010-009-SF.

TABLE OF CONTENTS

Acknowledgements	i
ABSTRACT	ii
Homebuyer Solar Option and Solar Offset Program.....	1
2700. Scope	1
2701. Definitions	1
Homebuyer Solar Option	4
2702. Homebuyer Solar Option.....	4
Solar Offset Program	6
2703. Requirements for Solar Offset Program.....	6
Other Issues.....	11
2704. Future Ordinances Requiring Solar	11

Homebuyer Solar Option and Solar Offset Program

CALIFORNIA CODE OF REGULATIONS, TITLE 20, Division 2, Chapter 9, Article 1, Sections 2700-2704

2700. Scope

These regulations establish the Homebuyer Solar Option and the Solar Offset Program pursuant to Public Resources Code Section 25405.5. These regulations apply to the developer/seller of production homes and include procedures which a developer/seller shall utilize when determining their selected compliance path.

A seller of production homes shall offer a solar energy system option to all potential home buyers that enter into negotiations to purchase a new production home constructed on land for which an application for a tentative subdivision map has been deemed complete on or after January 1, 2011.

A developer/seller of production homes who does not participate in the Homebuyer Solar Option program shall install an offset solar energy system, generating specified amounts of electricity, on another project(s). The offset solar energy system shall generate an amount of electricity equivalent to the amount of electricity generated by solar energy systems installed on production homes located in a development, assuming 20 percent of the prospective home buyers would have installed solar energy systems.

Authority cited: Public Resources Code Sections 25213, 25405.5(b) and 25405.5(c)

Reference: Public Resources Code Sections 25213, 25405.5(b) and 25405.5(c)

2701. Definitions

For the purpose of these regulations, the following definitions shall apply:

- (a) AC means alternating current.
- (b) *Banking* means the accumulation of expected annual time dependent valuation (TDV) energy from a(n) offset solar energy system(s) for future use in the solar offset program.
- (c) *Building Energy Efficiency Standards for Residential and Nonresidential Buildings* means the California Building Energy Efficiency Standards as set forth in the California Code of Regulations, Title 24, Part 6.
- (d) *Solar Offset Program Calculator* means a calculator based on the California Energy Commission Photovoltaic (CECPV) model. This calculator incorporates detailed inverter performance modeling and uses weather data from the 16 climate zones in California. The calculator allows a user to select photovoltaic modules and inverters from a library of eligible equipment and generate the estimated monthly kWh production and annual TDV (kWh) production for a specified solar energy system. The calculator is located at: http://www.gosolarcalifornia.org/tools/nshpcalculator/download_calculator.php

- (e) *Climate Zone* means the 16 geographic areas of California for which the Energy Commission has established typical weather data, prescriptive packages and energy budgets.
- (f) *Energy Commission* means the State of California Energy Resources Conservation and Development Commission, commonly known as the California Energy Commission.
- (g) *IOU* means investor-owned utility.
- (h) *kW* means kilowatts or 1,000 watts, as measured from the alternating current side of the solar energy system inverter consistent with Section 223 of Title 15 of the United States Code.
- (i) *MW* means megawatts or 1,000,000 watts.
- (j) *Minimal Shading* means that no existing, planned, or potential shading obstructions are closer than a distance of twice the height that the obstruction extends above the nearest point on the PV array. Any obstruction that projects above the point on the PV array that is closest to the obstruction shall meet this criterion for the PV array to be considered minimally shaded.
- (k) *New Solar Homes Partnership (NSHP)* means the part of the comprehensive statewide solar program, known as the California Solar Initiative, that is applicable to new residential construction in the utility territories of Pacific Gas and Electric (PG&E), Southern California Edison (SCE), San Diego Gas & Electric (SDG&E), and Golden State Water Company (doing business as Bear Valley Electric Service). The NSHP provides financial incentives and other support to home builders, encouraging the construction of new, energy-efficient solar homes.
- (l) *Offset Solar Energy System* means a solar energy system that is used to meet the requirements of the Solar Offset Program.
- (m) *POU* means publicly-owned utility.
- (n) *Production Home* means a single-family residence constructed as part of a development of at least 50 homes per project that is intended or offered for sale.
- (o) *PV* means flat-plate non-concentrating photovoltaic modules.
- (p) *Reference Solar Energy System* means a fictitious solar energy system representing the average solar energy system potentially installed under Homebuyer Solar Option and used for calculating expected annual TDV energy equivalency for the Solar Offset Program.
- (q) *Solar Energy System* means a solar energy device that has the primary purpose of providing for the collection and distribution of solar energy for the generation of electricity that

produces at least 1 kW, and not more than 5 MW, alternating current rated peak electricity, and that meets or exceeds the following:

- (1) All components in the solar energy system are new and unused, and have not previously been placed in service in any other location or for any other application;
 - (2) The solar energy system is connected to the electrical corporation's electrical distribution system within the state;
 - (3) The solar energy system has meters or other devices in place to monitor and measure the system's performance and the quantity of electricity generated by the system; and
 - (4) The solar energy system is installed in conformance with the manufacturer's specifications and in compliance with all applicable electrical and building code standards.
- (r) *Time-Dependent Valuation (TDV) Energy* means the time varying energy caused to be used by the building to provide space conditioning and water heating and for specified buildings lighting. TDV energy accounts for the energy used at the building site and consumed in producing and delivering energy to a site, including, but not limited to, power generation, transmission and distribution losses.

Authority cited: Public Resources Code Sections 25213 and 25405.5(b)

Reference: Public Resources Code Sections 25213 and 25405.5(b)

Homebuyer Solar Option

2702. Homebuyer Solar Option

(a) **Disclosure to Prospective Home Buyer.** A seller of production homes offering solar as an option shall provide the following information to the prospective home buyer:

- (1) Total installed cost of the solar energy system;
- (2) Estimated cost savings associated with the solar energy system option as shown in Table 1;
 - (A) The figures in Table 1 represent a range of expected annual kW and dollar savings from a 1 kW solar energy system. A seller of production homes offering solar as an option shall provide the relevant information from Table 1 to the prospective home buyer; and
 - (B) The estimates in this table are highly general. More specific estimates for a given site will rely on the geographic location of the PV system, orientation (azimuth and tilt) of the PV system, available insolation (amount of solar radiation incident on PV system), shading conditions, system loss factors, annual electricity consumption, utility rates, and other factors. Prospective home buyers are encouraged to get a site specific estimate of annual energy production and dollar savings.

Table 1: Estimated Annual kWh and Dollar Savings of a 1 kW Solar Energy System

Utility Territory	Estimated Annual kWh Savings	Estimated Annual Dollar Savings
Pacific Gas and Electric	1200-1950	\$190 - \$500
Southern California Edison	1500-2050	\$250 - \$410
San Diego Gas & Electric	1500-2050	\$210 - \$380
Sacramento Municipal Utility District	1600-1900	\$150 - \$190
Los Angeles Department of Water and Power	1500-1950	\$200 - \$260

- (3) Information about California solar energy system incentives; and
 - (4) Information about the Go Solar California website.
- (b) **Reporting Requirements.** A seller of production homes who selects the option to offer solar as an option to prospective home buyers shall report the following information to the Energy Commission on an annual basis:
- (1) Identifying information for development;
 - (2) Total number of planned homes;

- (3) Utility territory of development;
 - (4) Number of homes sold in the development in the reported year;
 - (5) Number of homes where the solar option was installed in the reported year;
 - (6) Average capacity (in AC kW) and average total installed cost of solar energy systems installed in the reported year; and
 - (7) If any solar energy systems installed in the reported year received an incentive, provide information about the incentive program(s), number of solar energy systems that received an incentive, and average dollar amount of incentive.
- (c) **Verification of Compliance.** Sellers shall report this information to the Energy Commission by May 1 of each year for the previous calendar year. Information reported to the Energy Commission may be made available to the public.
- (1) The reported information shall be endorsed by a principal or corporate officer of the seller's company; and
 - (2) The "solar as an option" disclosure shall be made available to prospective home buyers at point of sale and on the seller's website. The Energy Commission reserves the right to review the solar as an option materials disclosed to the prospective home buyer.

Authority cited: Public Resources Code Sections 25213, 25405.5(b) and 25783(b)

Reference: Public Resources Code Sections 25213, 25405.5(b) and 25783(b)

Solar Offset Program

2703. Requirements for Solar Offset Program

- (a) A seller of production homes who does not participate in the Homebuyer Solar Option Program shall participate in the Solar Offset Program by installing an offset solar energy system. The amount of electricity required to be generated by the offset solar energy system shall be equal to the amount of electricity generated by solar energy systems installed, assuming 20 percent of prospective home buyers would have installed solar energy systems.
- (b) **Offset Solar Energy System.** Offset solar energy systems shall meet the following requirements:
 - (1) **Solar Energy System.** Only solar energy systems composed of PV modules are eligible for the Solar Offset Program.
 - (2) **Interconnection Date.** Only solar energy systems interconnected to the utility grid on or after July 1, 2010, are eligible for the Solar Offset Program.
 - (3) **Incentives.** Offset solar energy systems are not eligible to receive an incentive from any California statewide incentive program or similar POU/IOU program under the California Solar Initiative. Solar energy systems that have previously received an incentive from any California statewide incentive program or similar POU/IOU program under the California Solar Initiative are not eligible for participation in the Solar Offset Program.
 - (4) **Location.** The offset solar energy system must be located within the same utility territory as the development that is being offset.
 - (5) **Maximum Capacity.** The maximum capacity (in kW AC) of an offset solar energy system shall not exceed 5 MW.
 - (6) **Required Capacity.** The required capacity (in kW AC) of an offset solar energy system shall have an expected annual time-dependent valuation (TDV) energy, as calculated by the Solar Offset Program Calculator version 1.0, that is equal to or greater than the total annual expected TDV energy calculated for the development that is being offset, based on 20 percent of prospective home buyers installing a reference solar energy system had the development participated in the homebuyer solar option program. The requirements for the reference solar energy system are described in Section 2703 (c).
 - (7) **Major Solar Energy System Components.** All major solar energy system components shall be included on the Energy Commission's Eligible Equipment Lists. This includes PV modules, inverters, and meters.

(8) **Field Verification.** The solar offset system shall successfully complete third-party field verification using the protocol described in Appendix 2 of the *Guidelines for California's Solar Electric Incentive Programs (Senate Bill 1) Third Edition*, June 2010, Energy Commission Publication number CEC-300-2010-004-CMF.

(9) **Initial Reporting.** Within 60 days of the interconnection of the offset solar energy system to the utility grid, the developer/seller shall report the following information to the Energy Commission:

- (A) Written proof from utility of interconnection of the offset solar energy system to the utility's grid;
- (B) Date of interconnection;
- (C) Expected TDV energy calculation, for the offset solar energy system, as calculated by the Solar Offset Program Calculator version 1.0; and
- (D) Total installed cost of the offset solar energy system.

The information reported to the Energy Commission may be made available to the public.

(10) **Use of Offset Solar Energy System to Offset a Future Development.** An offset solar energy system may be used to offset multiple housing developments in accordance with Section 2703 (d).

(c) **Reference Solar Energy System.** The reference solar energy system shall be based on the following:

(1) **Capacity.** Capacity shall be 2 kW AC.

(2) **Installation Characteristics.** The installation characteristics shall consist of the following:

- (A) True azimuth of 170 degrees, assuming true north is zero degrees;
- (B) Tilt of 22.6 degrees, equivalent to a 5:12 roof pitch;
- (C) Mounting height from ground of 12 feet, equivalent to NSHP "One-Story";
- (D) Fixed PV array; and
- (E) Minimal shading.

(3) **PV Modules.** PV modules shall be SunPower PL-PLT-63L-BLK-U.

- (4) **Inverter.** Inverter shall be Xantrex Technology GT2.8-NA-240/208 (240V).
- (5) **Expected Annual TDV Energy Calculation.** For each climate zone, the expected annual TDV energy shall be as shown in Table 2.
- (A) **Per-home Energy Equivalency.** The figures in Table 2 represent the expected annual kWh and TDV energy production per home by climate zone in accordance with the Energy Commission climate zone map located at http://www.energy.ca.gov/maps/building_climate_zones.html; and
- (B) Developers shall multiply the number of homes they are intending to offset by the appropriate TDV value, depending on the climate zone location of the development. This will allow developers to calculate the required capacity as specified in Section 2703 (b)(6).

Table 2: Expected Annual TDV Energy Calculation per Climate Zone

Climate Zone	Expected Annual kWh	Expected Annual TDV
CZ01	2927	43596
CZ02	3303	48686
CZ03	3735	52314
CZ04	3809	54135
CZ05	3887	54289
CZ06	3921	55388
CZ07	3837	61446
CZ08	3883	54577
CZ09	3723	52270
CZ10	3737	52572
CZ11	3802	56055
CZ12	3942	56627
CZ13	3987	53539
CZ14	4262	57345
CZ15	4164	55408
CZ16	3712	55960

Number of PV modules	PTC rating of PV modules (watts)	Weighted efficiency rating of inverter
40	55.1	0.94

Notes:

1. AC rating as calculated: 2.071760 kW, figures in table are scaled to 2 kW AC.
2. Calculations performed with Solar Offset Program Calculator version 1.0.
3. Calculated solar energy system consisting of 2 parallel strings each with 20 SunPower PL-PLT-63L-BLK-U modules and 1 Xantrex Technology GT2.8-NA-240/208 (240V) inverter.
4. TDV multipliers from the 2008 Building Energy Efficiency Standards for Residential and Nonresidential Buildings.

(d) **Banking.** The Energy Commission shall establish and manage a banking system that allows participants in the solar offset program to install a PV system and withdraw expected annual TDV energy from that “bank.” The developer/seller shall be allowed to use the banking system to offset multiple developments, and shall be allowed to make deposits and withdrawals from the “bank” as long as the statute is in effect. The Energy Commission shall develop a system that will document all activities involved with the banking system. Developers/sellers that wish to utilize the bank shall report the following to the Energy Commission when an offset system is ready to be deposited into the bank:

- (1) Name of Developer/Seller;
- (2) Capacity of Offset Solar Energy System (in kW AC);
- (3) Expected Annual TDV Energy from Offset Solar Energy System;
- (4) City Location of Offset Solar Energy System;
- (5) Utility Territory of Offset Solar Energy System;
- (6) Interconnection Date of Offset Solar Energy System;
- (7) Location of Development Being Offset;
- (8) Name of Development Being Offset;
- (9) Date Offset System Was Applied to Development;
- (10) Total Number of Homes in Development(s) Being Offset;
- (11) Number of Homes Being Offset (20% of Development);
- (12) Climate Zone of Development Being Offset;
- (13) Expected Annual TDV Energy Equivalent for Each Home Being Offset;
- (14) Total Expected Annual TDV Energy of Entire Development Being Offset; and

(15) Balance (Expected Annual TDV Energy).

- (e) **Annual Reporting.** If there is a positive expected annual TDV energy balance for an offset solar energy system, the developer/seller shall report to the Energy Commission, by May of each year, the kilowatt-hour generation of the offset solar energy system for the prior calendar year. Information reported to the Energy Commission may be made available to the public.
- (f) **Withdrawals From the Banked Offset System.** Developers/seller shall report the following to the Energy Commission when they wish to apply the offset to a development and make a withdrawal from the bank:
 - (1) Name of Development Being Offset;
 - (2) Location and Climate Zone of Development Being Offset; and
 - (3) Total Number of Homes in Development Being Offset.

The information reported to the Energy Commission shall be made available to the public.

Authority cited: Public Resources Code Sections 25213, and 25405.5

Reference: Public Resources Code Sections 25213 and 25405.5

Other Issues

2704. Future Ordinances Requiring Solar

- (a) In the event that any California city, county, or other governing political subdivision, requires the installation of solar energy systems on new homes at a future date, such a requirement shall supersede the provisions of this article.

Authority cited: Public Resources Code Sections 25213 and 25405.5

Reference: Public Resources Code Sections 25213 and 25405.5