



Committee Hearing

Solar Offset Program Rulemaking

December 7, 2010





Agenda

- 1:00 p.m. Welcome
Commissioner James Boyd, Vice Chair and
Presiding Member of the Renewables Committee
- 1:15 p.m. – 1:30 p.m. Proposed Regulations Overview
Sherrill Neidich
- 1:30 p.m. Procedure for Public Comment
Jonathan Knapp, Legal Counsel
- 1:30 p.m. – 4:00 p.m. Public Comment



Proposed Regulations



Section 2700. Scope

- Regulations apply to the developer/seller of production homes.
- Require a seller of production homes to offer the option of a solar energy system to all prospective 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.
- Require a developer/seller of production homes who does participate in the solar option program to install an offset solar energy system, generating specified amounts of electricity, on another project.



Section 2701. Definitions

This section contains definitions necessary to understand the terms that are used in Sections 2700-2704.



Section 2702. Homebuyer Solar Option

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:

- Total installed cost of solar energy system option.
- Estimated cost savings associated with the solar energy system (Table 1).
- Information about the California solar energy system incentives.
- Information about the Go Solar California website.



CALIFORNIA ENERGY COMMISSION

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

Climate Zone¶	Estimated Annual kWh/kWac Generation¶	Estimated Annual Dollar Savings at Various Utility Electric Energy Rates¶				
		\$0.10/kWh¶	\$0.15/kWh¶	\$0.20/kWh¶	\$0.25/kWh¶	\$0.30/kWh¶
CZ01¶	1220--1475¶	\$122--\$148¶	\$183--\$221¶	\$244--\$295¶	\$305--\$369¶	\$366--\$443¶
CZ02¶	1420--1660¶	\$142--\$166¶	\$213--\$249¶	\$284--\$332¶	\$355--\$415¶	\$426--\$498¶
CZ03¶	1515--1885¶	\$152--\$189¶	\$227--\$283¶	\$303--\$377¶	\$379--\$471¶	\$455--\$566¶
CZ04¶	1560--1920¶	\$156--\$192¶	\$234--\$288¶	\$312--\$384¶	\$390--\$480¶	\$468--\$576¶
CZ05¶	1570--1965¶	\$157--\$197¶	\$236--\$295¶	\$314--\$393¶	\$393--\$491¶	\$471--\$590¶
CZ06¶	1590--1980¶	\$159--\$198¶	\$239--\$297¶	\$318--\$396¶	\$398--\$495¶	\$477--\$594¶
CZ07¶	1545--1940¶	\$155--\$194¶	\$232--\$291¶	\$309--\$388¶	\$386--\$485¶	\$464--\$582¶
CZ08¶	1565--1965¶	\$157--\$197¶	\$235--\$295¶	\$313--\$393¶	\$391--\$491¶	\$470--\$590¶
CZ09¶	1570--1870¶	\$157--\$187¶	\$236--\$281¶	\$314--\$374¶	\$393--\$468¶	\$471--\$561¶
CZ10¶	1560--1880¶	\$156--\$188¶	\$234--\$282¶	\$312--\$376¶	\$390--\$470¶	\$468--\$564¶
CZ11¶	1595--1905¶	\$160--\$191¶	\$239--\$286¶	\$319--\$381¶	\$399--\$476¶	\$479--\$572¶
CZ12¶	1670--1975¶	\$167--\$198¶	\$251--\$296¶	\$334--\$395¶	\$418--\$494¶	\$501--\$593¶
CZ13¶	1705--2000¶	\$171--\$200¶	\$256--\$300¶	\$341--\$400¶	\$426--\$500¶	\$512--\$600¶
CZ14¶	1790--2140¶	\$179--\$214¶	\$269--\$321¶	\$358--\$428¶	\$448--\$535¶	\$537--\$642¶
CZ15¶	1755--2085¶	\$176--\$209¶	\$263--\$313¶	\$351--\$417¶	\$439--\$521¶	\$527--\$626¶
CZ16¶	1560--1860¶	\$156--\$186¶	\$234--\$279¶	\$312--\$372¶	\$390--\$465¶	\$468--\$558¶

Note: The estimated annual kWh/kWac generation values are from calculations using the Solar Offset Program Calculator, which is based on the California Energy Commission Photovoltaic (CECPV) model. The actual performance of a solar energy system will be based on numerous factors, including but not limited to, the available solar insolation at the specific geographic location, the azimuth and tilt of the solar energy system, shading conditions at the specific location, and system loss factors. The estimated annual dollar savings are based on a flat utility electric energy rate rather than a tiered rate. The actual dollar savings will be based on the utility electric energy rate structure, the overall electricity consumption of the home, and the amount of energy produced by the solar energy system. The values in the table should not be interpreted as a guarantee of solar energy system performance nor should the values be used as the sole basis for purchasing a solar energy system. Prospective home buyers interested in purchasing a solar energy system are encouraged to obtain a site-specific estimate of annual energy generation and dollar savings. Prospective home buyers are encouraged to visit the Go Solar California website: www.gosolarcalifornia.org/tools/calculators.php to view a number of online calculators that have been developed to help make a decision on going solar.¶

The Energy Commission climate zone map is located at: www.energy.ca.gov/maps/building_climate_zones.html¶



Section 2702. Homebuyer Solar Option cont'd

Reporting Requirements

A seller of production homes who elects to offer solar as an option to prospective home buyers shall report the following information on an annual basis :

- Legal description of the proposed subdivision identified on the Tentative Subdivision Map.
- Total number of planned homes identified on the Tentative Subdivision Map.
- Utility territory of development.
- Number of homes sold in the development in the reported year.
- Number of homes where the solar option was installed in the reported year.
- Average capacity (in AC kW) and average total installed cost of solar energy system option installed in the reported year.
- If any solar energy systems installed received an incentive, what program, number of systems that received incentive, average dollar amount of incentive.



Section 2702. Homebuyer Solar Option cont'd

Verification of Compliance

A seller of production homes shall report the following information by May 1 of each year for previous calendar year:

- Reporting requirements shall be endorsed, under penalty of perjury, by a principal or corporate officer of the seller's company.
- "Solar as an option" disclosure shall be made available to prospective home buyers at sales office 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.



Section 2703. Requirements for Solar Offset Program

Solar Offset Program Participation

- A seller of production homes who does not participate in the Homebuyer Solar Option shall participate in the Solar Offset Program by installing an offset solar energy system.
- The seller shall assume that 20 percent of prospective homebuyers, of planned homes identified on the Tentative Subdivision Map, would have installed solar energy systems.
- If the Tentative Subdivision Map identifies less than 50 planned homes, and the seller intends to file Phased Final Maps, the number of homes identified on the Tentative Subdivision Map will be aggregated with the number of additional homes identified on any Phased Final Maps.



Section 2703. Requirements for Solar Offset Program cont'd

Solar Offset Program Participation cont'd

If the aggregate number of planned homes identified in the Tentative Subdivision Map and Phased Final Maps exceeds 50, then the number of additional homes identified on any subsequently filed Phased Final Maps will not be aggregated with the number of homes identified in the Tentative Subdivision Map or any previously filed Phases Final Maps.



Section 2703. Requirements for Solar Offset Program cont'd

Required Time-Dependent Valuation (TDV) Energy Equivalency

The electricity equivalency for the solar offset system shall be calculated using TDV energy.

The required TDV energy equivalency for the proposed subdivision being offset shall be based on the assumption that a reference solar energy system would have been installed by prospective home buyers.



Section 2703. Requirements for Solar Offset Program cont'd

Offset Solar Energy System

The offset solar energy system shall meet the following eligibility requirements:

- Only solar energy systems composed of PV modules.
- Interconnected to the utility grid on or after July 1, 2010.
- Must be located within the same utility territory as the proposed subdivision that is being offset.
- Maximum capacity in kW AC, shall not exceed 5 MW.



Section 2703. Requirements for Solar Offset Program cont'd

Offset Solar Energy System cont'd

- Expected annual TDV energy shall be calculated by using the Solar Offset Program Calculator version 1.0.
- The expected annual TDV shall be equal or greater than the required TDV energy equivalency of the proposed subdivision being offset.
- All major solar energy system components shall be included on the Energy Commission's Eligible Equipment lists (PV modules, inverters and meters).
- Shall successfully complete third-party field verification.



Section 2703. Requirements for Solar Offset Program cont'd

Offset Solar Energy System cont'd

Initial Reporting - within 60 days of the adoption of these regulations, or interconnection of the offset solar energy system to the utility grid (whichever is later), developer/seller shall provide the following information to the Energy Commission:

- Written proof from utility of interconnection.
- Date of interconnection.
- Expected TDV energy calculation.
- Written agreement by the developer/seller and the system owner identifying a specific PV system to be used for the Solar Offset Program. The written agreement should include:
 - Offset solar energy system address location.
 - Total dollar amount the developer/seller contributed towards the installation.
 - Total installed cost of system.



Section 2703. Requirements for Solar Offset Program cont'd

Offset Solar Energy System cont'd

Partial Funding of Offset Solar Energy System – If the developer/seller pays for less than the total cost of a PV system to be used as an offset solar energy system, the developer/seller shall only be eligible to claim a fraction of the total annual expected TDV energy of the PV system as an offset credit.

The fraction of the total annual expected TDV energy eligible to be claimed as an offset solar energy system shall be equal to the fraction of the total cost of the PV system paid by the developer/seller.



Section 2703. Requirements for Solar Offset Program cont'd

Offset Solar Energy System cont'd

Use of Offset Solar Energy System to Offset a Future Subdivision(s) – An offset solar energy system may be used to offset multiple subdivisions, including, but not limited to, subdivisions at different locations in accordance with the Solar Offset Bank.



Section 2703. Requirements for Solar Offset Program cont'd

Offset Solar Energy System cont'd

Reference Solar Energy System – The reference solar energy system shall be based on the NSHP California Flexible Installation criteria which consists of:

- Capacity shall be 2 kW AC.
- Installation characteristics shall be based on NSHP California Flexible Installation criteria.
- Commonly used PV modules in NSHP shall be used.
- Commonly used inverter in NSHP shall be used.



Section 2703. Requirements for Solar Offset Program cont'd

Reference Solar Energy System cont'd

Expected Annual TDV Energy Calculation - this section identifies for each climate zone, the expected annual TDV energy of the reference system, as calculated by the Solar Offset System Program Calculator version 1.0. (Table 2)



Table 2: Expected Annual TDV Energy of Reference Solar Energy System

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

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 composed of the most commonly used PV module and inverter in NSHP as of June 28, 2010.
4. TDV multipliers from the 2008 Building Energy Efficiency Standards for Residential and Nonresidential Buildings.

Per-home TDV Energy Equivalency –

This provision ensures that the participants in the Solar Offset Program will be using consistent methodologies when calculating the expected annual TDV energy calculation for each climate zone (outlined in Table 2).

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.



Solar Offset Program Calculator (SOPC)

Project Title

Number of Inverters per Site with Identical Design Details

PV Module

Standoff Height

Mounting Height ft

Number of Series Modules in each String

Number of Parallel Strings per Inverter

Tracking

Roof Pitch Tilt degrees

Azimuth degrees

Inverter

City Climate Zone

Minimal Shading Run Status

SOPC 1.0 SOPM101/SOP1101

The Solar Offset Program Calculator uses the CECPV model which implements the "5 parameter" public domain algorithms published by Beckman, W.A., et al., Solar Energy: 80 (2006) 78-88.

Instructions:

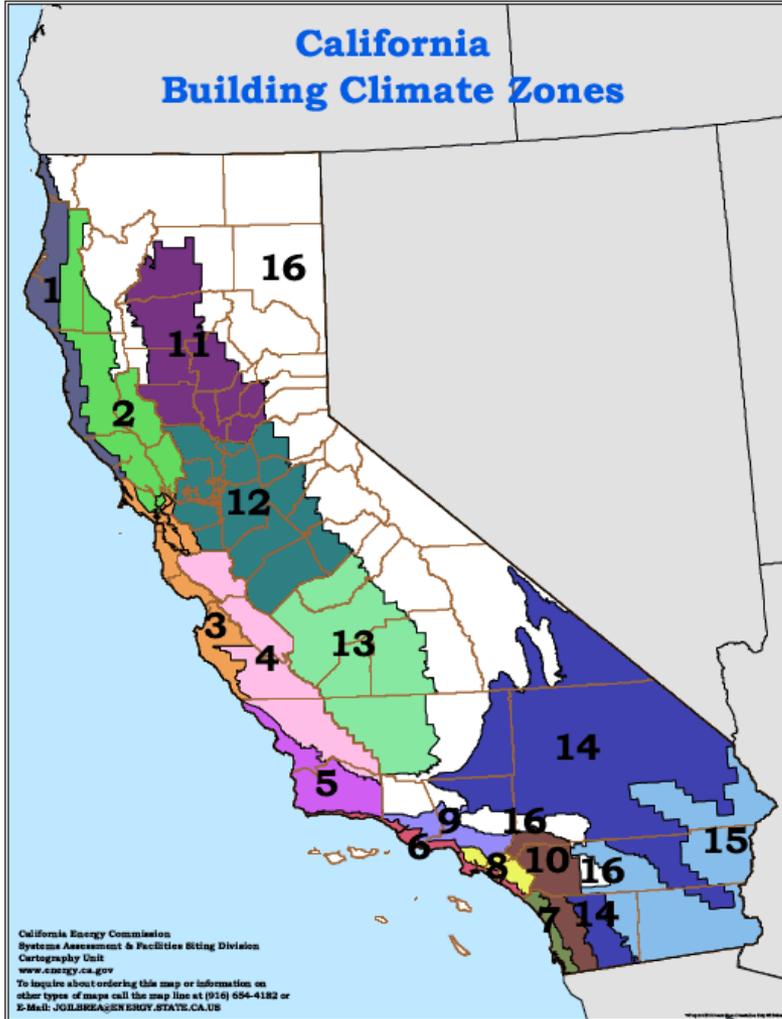
1. Number of Sites with Solar means the number of physical addresses where a solar energy system is proposed to be installed. Typically this will be 1.
 2. Number of Inverters per Site with Identical Design Details means the number of inverters per site where all installation characteristics of the array are identical. For microinverters, this number will be greater than 1.
 3. Standoff height is the minimum distance from the mounting surface to the back of the modules.
 4. Mounting height is the distance from the ground to the lowest point on the array.
 5. [Click](#) for information on tracking types.
 6. Select the roof pitch (rise/run) or select Enter Tilt to enter tilt in degrees (between 0 and 90).
 7. Azimuth of array; 180 degrees is due South, 90 due East, 270 due West
 8. Select a city; if your city is not listed, choose the city that was used in your Title 24 energy efficiency calculations.
[Click](#) for Energy Commission Climate Zone Information.
* [Click](#) for Google Earth Climate Zone Overlay (Google Earth must be installed on your computer).
+ [Click](#) for City of San Diego Development Services climate zone map.
- # Building Department uses electronic mapping services. Verify climate zone with building department.
9. Check Minimal Shading only if there are no shading obstructions (including the mature height of planned trees) which fail to meet the minimal shading criteria. Minimal shading criteria is met only if all obstructions are at a distance, more than twice their height, from the array. For installations with shading obstructions that fail to meet the minimal shading criteria, click the Add Shading Detail button.
 10. Click the Run button to begin the simulation. The program will process the data and estimate monthly and annual kWh production. The Run button will only work for simulations that are Minimal Shading.

Solar Offset Program Calculator, version 1.0 located at:
www.energy.ca.gov/2010-SOPR-1/documents/index.html



Section 2703. Requirements for Solar Offset Program cont'd

California Building Climate Zone Map



Energy Commission climate zone map located at:

www.energy.ca.gov/maps/building_climate_zones.html



Section 2703. Requirements for Solar Offset Program cont'd

Solar Offset Bank

The Solar Offset Bank will allow participants in the solar offset program to aggregate their offset solar energy systems and apply those system to multiple subdivisions, including, but not limited to subdivisions at different locations. The Energy Commission shall manage the Solar Offset Bank.

- Any offset solar energy system that satisfies the requirements shall be eligible to be used in the Solar Offset Bank.
- A developer/seller shall notify the Energy Commission in writing if they wish to enter (deposit) an offset solar energy system into the Solar Offset Bank by reporting the following:
 - Name of developer/seller.
 - Capacity of offset solar energy system (in kW AC).
 - Expected annual TDV energy from the offset solar energy system.
 - City location of offset solar energy system.
 - Utility territory of offset solar energy system.
 - Interconnection date of offset solar energy system.



Section 2703. Requirements for Solar Offset Program cont'd

Solar Offset Bank cont'd

Withdrawals from the Solar Offset Bank – A developer/seller shall report the following information to the Energy Commission when they wish to apply an offset to a proposed subdivision and make a withdrawal from the Solar Offset Bank:

- Legal description of the proposed subdivision being offset, and where applicable, legal description of the portions or phases.
- Date offset system was applied to proposed subdivision.
- Total number of homes in proposed subdivision that are being offset, and, where applicable, the total number of planned homes identified on the portions or phases.
- Number of homes being offset (20% of homes in the proposed subdivision).
- Climate zone of subdivision being offset.



Section 2703. Requirements for Solar Offset Program cont'd

Solar Offset Bank cont'd

Calculating Balance – After each request from a developer/seller, the Energy Commission shall report the following information in writing to the developer/seller:

- Required TDV energy equivalency per home for the proposed subdivision being offset.
- Required TDV energy equivalency for the proposed subdivision being offset.
- Balance (expected annual TDV energy).



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Solar Offset Program - Banking

Developer/ Seller	Capacity of Offset Solar Energy System (kW AC)	Expected Annual TDV Energy from Offset Solar Energy System	Location of Offset Solar Energy System	Climate Zone of Offset Solar Energy System	Utility Territory of Offset Solar Energy System	Interconnection Date of Offset Solar Energy System	Location of Development that is being Offset	Name of Development that is being Offset	"Withdrawal" Date	Total Number of Homes in Development that is being Offset	Number of Homes Being Offset (20 % of Development)	Climate Zone of Development that is being Offset	Expected Annual TDV Energy Equivalent for Each Home that is being Offset	Total Expected Annual TDV Energy of Entire Development that is being Offset	Balance (Expected Annual TDV Energy)
ABC Builders	1,500	39,235,538	San Francisco	3	PGE	7/1/2010	Davis	Sunny Side 1	1/1/2011	200	30	12	56627	1698798	32,589,864
							Stockton	Sunny Side 2	1/1/2012	150	30	12	56627	1698798	
							San Jose	Sunny Side 3	1/1/2013	300	60	4	54135	3248073	
Builders R Us	1,000	26,216,572	San Bernardino	10	SCE	7/6/2010	Hesperia	Meadow View 1	1/1/2012	100	20	14	57345	1146890	22,775,901
							Lancaster	Valley View 1	1/1/2013	100	20	14	57345	1146890	
							Ridgecrest	Desert View 1	1/1/2013	100	20	14	57345	1146890	

Note: This is one proposed approach to tracking “solar offset bank” deposits, withdrawals and balance. This is not a final document.



Section 2703. Requirements for Solar Offset Program cont'd

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 1 of each year the kilowatt-hour generation of the offset solar energy system for the prior calendar year.



Section 2704. Future Ordinances Requiring Solar

In the event that any California city, county or other governing political subdivision, requires the installation of solar energy system on production homes as a future date, such a requirement shall supersede the provisions of these regulations.



Next Steps

Adopting Proposed Regulations

- The Commission will consider adoption of the proposed regulations at the December 29, 2010 Business Meeting (unless they decide to modify Express Terms 15-Day or 45-Day Language).
- After proposed regulations have been adopted, staff will prepare the Final Statement of Reasons for submission to the Office of Administrative Law.



Contact Information

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Solar Offset Program Rulemaking Web Page

www.energy.ca.gov/2010-SOPR-1/index.html



Public Comment