

The Bay Area Solar PV Ordinance



INSTRUCTIONS

The Bay Area Solar PV Ordinance template allows local government staff to prepare the ordinance for adoption with minimal modifications. These instructions provide detailed explanations of each section of the ordinance. For local governments that wish to adopt more aggressive renewable energy requirements than are included in the Bay Area Solar PV Ordinance, the end of this document includes information on other reach codes and studies that could support such efforts. It should be noted, however, that any modifications of the Bay Area Solar PV Ordinance may require additional analysis to demonstrate the requisite cost-effectiveness.

Basic Scope

The Bay Area Solar PV Ordinance is adapted from the *Draft Model Local Solar Ordinance* prepared by the California Energy Commission (CEC), a cost-effective, progressive step towards zero-net-electricity residential buildings. The Bay Area Solar PV Ordinance provides additional clarifications and features useful to local government staff including:

- ◆ exemptions and definitions based on prior local energy code ordinances
- ◆ example findings ('whereas' statements)
- ◆ alternative compliance options
- ◆ voluntary best practices to consider for new residential construction
- ◆ CEQA compliance statement

Elements of the Code

Findings

Findings are the facts, regulations and policies used to justify a decision by a governing body. They are also necessary to comply with state regulations, including adoption of energy reach codes. For state approval, the findings may be adopted by resolution or as part of the ordinance itself, as is the case with the Bay Area Solar PV Ordinance. The findings in the Bay Area ordinance template are broad and may not apply to all jurisdictions, and therefore may need to be modified to reflect local conditions.

Findings for all jurisdictions must expressly include the following:

- ◆ citation of state law providing the local authority for the amendment(s) to the State Code
- ◆ reference to a study concluding the proposed amendment(s) are cost-effective
- ◆ reasons why the ordinance is reasonably necessary because of local climatic, geological, or topographical conditions, and
- ◆ evidence of CEQA compliance. (See CEQA section below)

Section A—Definitions

Definitions can be added to this section as needed. Coordination with local building departments is recommended to help add and clarify definitions for local context.

Section B—Purpose and Intent

This section succinctly describes what the ordinance is expected to achieve and who it is intended to assist.

Section C—Requirements

There are two pathways to comply with the Bay Area Solar PV Ordinance: prescriptive and performance. Both methods require local governments to first identify their climate zone(s) to determine the minimum capacity of solar PV to install. California climate zones are roughly designated based on zip code. All local jurisdictions in the Bay Area are in either Climate Zone 2, 3, 4 or 12, though some

may span more than one zone. Climate zone information is available on the California Energy Commission's website (http://www.energy.ca.gov/maps/renewable/building_climate_zones.html). The website includes a zip code lookup table, a climate map and a more refined Google Earth search tool.

Local Jurisdictions with Multiple Climate Zones

A local government can determine its ordinance climate zone(s) as follows: 1) Use the predominant climate zone that covers the greatest geographic range within the jurisdiction. Using this method requires demonstrating that the minimum solar PV sizing requirements remains cost-effective. 2) Base the solar PV system size on the climate zone where the property is located. 3) Set the requirements based on the lowest values of all the climate zones. However, this option may not optimize a given building's solar potential.

Prescriptive Compliance

The prescriptive compliance method can only be used for residential buildings with fewer than 4,500 square feet of conditioned floor space that meet the state's minimum efficiency standards. The minimum PV system size increases in each climate zone as the home size gets incrementally larger. Table 1 in the ordinance template should be filled in with applicable climate zone-specific data. The PV system values for every Bay Area jurisdiction (and all other California jurisdictions) can be found in Table 3 of *Local PV Ordinance Cost Effectiveness Study* included in this Toolkit.

Performance Compliance

The performance compliance method can be used for any new home size, but must be used for all new residences larger than 4,500 sq. ft. of conditioned floor space. This method provides more flexibility by allowing applicants to use a combination of energy efficiency and on-site solar PV to achieve a specified energy performance level. The ordinance provides a sample performance system sizing table (Table 2) based on the Time Dependent Valuation of energy (TDV) that can be populated with climate zone-specific data from Table 2 in the *Local PV Ordinance Cost Effectiveness Study*.

Section D—Other Considerations (Optional)

The Bay Area ordinance template encourages additional, voluntary solar energy strategies and technologies that builders or developers should consider incorporating into new residential construction. These considerations do not affect the cost-effectiveness of the ordinance since they are voluntary and not required by the ordinance.

Section F—Compliance Alternatives (Optional)

The Bay Area Solar PV Ordinance provides several alternative compliance strategies that local governments may wish to consider. These strategies are optional and serve to give flexibility to local building departments and developers to comply with the ordinance. Staff is advised to consider whether they are compatible with existing local policies and procedures.

Section G—Exceptions

The local Building Official may reduce the requirements or exempt a building if it is determined that there are sufficient practical challenges to meeting the ordinance requirements, such as limited rooftop availability or shading from nearby structures, topography or vegetation. The applicant is responsible for demonstrating requirement infeasibility when applying for an exception.

Section H—Reporting (Optional)

Quantifying on-site renewable energy installed on new construction can be useful for several reasons. It assesses the impacts of the ordinance, can demonstrate implementation of Climate Action Plans, and helps refine greenhouse gas inventories. Tracking can be incorporated into the plan check phase by including reporting fields about whether the permit is subject to the ordinance, details on the required solar capacity of the home, and the total community-wide installed capacity. A solar ordinance memo field may be used to record any alternatives or exceptions requested and approved.

The National Renewable Energy Laboratory (NREL) [PV Watts calculator](#) can help estimate solar production capacity. To estimate greenhouse gas reductions associated with a building, apply the coefficient used in your community's Climate Action Plan emissions forecast.

Section I—California Environmental Quality Act

Pursuant to the California Environmental Quality Act (CEQA), local jurisdictions must identify any significant environmental impacts associated with a proposed ordinance. If the local Building Official (or other city representative) determines that there is no possibility that the activity in question may have a significant effect on the environment, in accordance with section 15061(b)(3), the activity is not subject to CEQA. Most local governments that have adopted ordinances similar to the Bay Area Solar PV Ordinance have used categorical exemptions under CEQA. A sample statement based on these actual exemptions is included in this Toolkit. This statement should be modified as deemed appropriate by a local jurisdiction's legal counsel.

Sections J through M—Local Forms

The remaining sections of the Ordinance can be modified to conform to standard local ordinance language.

Beyond the Basics— Additional Solar Ordinance Options

Adopting the Bay Area Solar PV Ordinance is a progressive first step for local jurisdictions to take action to decarbonize the buildings sector. The region’s 2017 Clean Air Plan, *Spare the Air, Cool the Climate*, developed by the Bay Area Air Quality Management District, includes an aggressive goal to achieve an 80 percent reduction in greenhouse gas emissions below 1990 levels by 2050. To achieve such deep reductions, all buildings—new *and* existing, residential *and* commercial, low-rise *and* high-rise—need to be weaned off fossil fuels as an energy source. This effort also includes minimizing the amount of natural gas used for space and water heating in buildings.

The following features could be adopted either as separate ordinances or could be incorporated into the basic Bay Area Solar PV Ordinance. It is important to note that if a local jurisdiction plans to incorporate any of the suggested features below, additional analysis would be needed to demonstrate cost-effectiveness.

Additional Solar (PV-Plus)

The basic model ordinance requires 80 percent of a home’s electricity use be from solar power. However, local jurisdictions that want more solar capacity installed, e.g., to offset natural gas use, can use a new CALGreen model ordinance, *Low-Rise Residential New Construction CALGreen—Voluntary Tiers*. Documents to support this ordinance are available at:

<http://localenergycodes.com/content/toolkit>

Solar Thermal

The Natural Resources Defense Council (NRDC) is developing a model solar thermal ordinance based on preliminary cost-effectiveness findings that would offer three compliance pathways, each of which would be in addition to the basic solar PV ordinance:

1. Install a high efficiency heat pump hot water heater and increase solar PV to meet 80 percent of the projected heat pump load
2. Install a solar thermal system that meets 60 percent of the hot water energy load
3. Comply with CALGreen Tier 2, that is, exceed the state’s minimum efficiency standard by at least 30 percent

High-Rise Residential

Southern California Edison, with ratepayer funds, has commissioned a cost-effectiveness study of higher energy performance (including solar installation) in the non-residential market (including high-rise multifamily). The report is expected to be available soon at:

<http://localenergycodes.com/content/toolkit>

Commercial Buildings

The Statewide Codes & Standards program is also working on a *Nonresidential New Construction (CALGreen Tier 1)* performance-based ordinance for commercial buildings which will soon be available on their website:

www.localenergycodes.com.

Energy Storage

Although there is limited precedent for requiring battery or other energy storage as part of a reach code, nor are there cost-effectiveness studies being undertaken, this emerging technology is likely to become significantly more important for balancing renewable electricity generation and electricity demand. New legislation will help accelerate deployment of energy storage, including AB 1637, which provides funding for behind-the-meter technologies, and AB 33, which directs the California Public Utilities Commission and the Energy Commission to analyze long-duration storage capabilities.

Local Government Facilities

State approval and cost-effectiveness studies are not required for adoption of more stringent standards for local government facilities (excluding schools), such as zero-net-energy requirements, if the buildings meet or exceed the California Energy Code requirements.