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Abstract

The City of Santa Barbara, California, modified its energy efficiency standards to correspond with the first level of the Architecture 2030 Challenge and to reduce its fossil fuel usage in its buildings by 50% below the regional average. Also, the City has set a goal to reduce energy consumption to achieve “carbon neutrality” by 2030 in new buildings and retrofits.

In order to meet these goals, the City has set forth increased minimum energy efficiency standards for all new construction (residential and commercial) of any size, additions to existing buildings or structures where the addition is greater than 100 square feet of conditioned floor area, and the installation of new heaters or circulation pumps for swimming pools, spas and water features. This ordinance supplements the 2005 California Building Energy Efficiency Standards and amends parts of it by providing builders with greater flexibility in meeting the city’s energy efficiency standards. For instance, the ordinance allows builders who install on-site solar photovoltaic (PV) to apply those energy reductions as a “credit” towards complying with the city’s general energy efficiency compliance requirements. Another example of how Santa Barbara’s ordinance goes beyond California’s 2005 Building Energy Efficiency Standards is that it requires all applicants for residential building permits, including new buildings or improvements that are covered by this Chapter, to install appliances that are Energy Star rated.

The Building Official will not issue a building permit to applicants unless the energy compliance documentation submitted with the permit application complies with the requirements of this Chapter. Documentation includes building drawings, specifications, and standard 2005 California Building Energy Efficiency Title 24 report forms.

Resource

CITY CODE – SANTA BARBARA, CALIFORNIA

TITLE 22: ENVIRONMENTAL POLICY & CONSTRUCTION

Chapter 22.82 – Energy Efficiency Standards

§ 22.82.010 to § 22.82.080

§ 22.82.010 Purpose.

This Chapter (“Energy Efficiency Standards”) sets forth increased minimum energy efficiency standards within the City of Santa Barbara for all new construction of any size, additions to existing buildings or structures over a certain size threshold, and the installation of new heaters or circulation pumps for swimming pools, spas and water features. This Chapter is intended to supplement the 2005 California Building Energy Efficiency Standards, as specified in California Code of Regulations, Title 24, Parts 1 and 6 (Standards). Compliance with the 2005 California Building Energy Efficiency Standards is required even if the increased minimum energy efficiency standards specified in this Chapter do not apply.

§ 22.82.020 Definitions.

For purposes of this Chapter 22.82, words or phrases used in this Chapter that are specifically defined in Parts 1, 2, or 6 of Title 24 of the California Code of Regulations shall have the same meaning as given in the Code of Regulations. In addition, the following words and phrases shall have the meanings indicated, unless context or usage clearly requires a different meaning:

A. 2005 BUILDING ENERGY EFFICIENCY STANDARDS.

The standards and regulations adopted by the California Energy Commission contained in Parts 1 and 6 of Title 24 of the California Code of Regulations as such standards and regulations may be amended from time to time.

B. EXISTING + ADDITION + ALTERATION.

An approach to modeling the time dependent valuation energy use of an addition including the existing building and alterations as specified in the Residential Compliance Manual and Nonresidential Compliance Manual.

C. NONRESIDENTIAL COMPLIANCE MANUAL.

The manual developed by the California Energy Commission, under Section 25402.1(e) of the Public Resources Code, to aid designers, builders, and contractors in meeting the requirements of the state’s 2005 Building Energy Efficiency Standards for nonresidential, high-rise residential, and hotel/motel buildings.

D. PHOTOVOLTAIC CREDIT.

A TDV Energy credit that may be used under certain conditions to demonstrate compliance with the City's general compliance requirements as specified in Section 22.82.070. This credit is available if the solar photovoltaic energy system is capable of generating electricity from sunlight, supplying the electricity directly to the building, and the system is connected, through a reversible meter, to the utility grid. The methodology used to calculate the time dependent valuation energy equivalent to the photovoltaic credit shall be the CECPV Calculator Version 2.1 or higher which may be found at the following web site: http://www.gosolarcalifornia.ca.gov/nshpc_alculator/download_calculator.html

E. RESIDENTIAL COMPLIANCE MANUAL.

The manual developed by the California Energy Commission, under Section 25402.1(e) of the Public Resources Code, to aid designers, builders, and contractors in meeting the requirements of the state's 2005 Building Energy Efficiency Standards for low-rise residential buildings.

F. SOLAR PHOTOVOLTAIC ENERGY SYSTEM.

A photovoltaic solar collector or other photovoltaic solar energy device that has a primary purpose of providing for the collection and distribution of solar energy for the generation of alternating current rated peak electricity. The installation of any solar photovoltaic energy system must meet all installation criteria of the current edition of the California Electrical Code and the California Energy Commission's Guidebook "Eligibility Criteria and Conditions for Incentives for Solar Energy Systems Senate Bill 1".

G. SWIMMING POOL.

Any structure intended to contain water over 18 inches deep.

H. TIME DEPENDENT VALUATION ENERGY or ("TDV ENERGY").

The time varying energy caused to be used by the building or addition 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 in delivering energy to a site, including, but not limited to, power generation, transmission and distribution losses. TDV Energy is expressed in terms of thousands of British thermal units per square foot per year (kBtu/sq.ft.-yr).

I. WATER FEATURE.

Any structure intended to contain water over 18 inches deep. Examples of water features include, but are not limited to, ponds and fountains.

§ 22.82.030 Applicability.

A. The provisions of this Chapter apply to any of the following buildings or improvements for which a building permit is required by this Code:

1. Any new building or structure of any size,
2. Any addition to an existing building or structure where the addition is greater than 100 square feet of conditioned floor area,
3. Indoor lighting alterations in conditioned spaces greater than 100 square feet of floor area within nonresidential buildings,
4. All new mechanical heating or cooling systems, and
5. All new heaters or circulation pumps for swimming pools, spas, and water features.

B. Subject to the limitations specified in this section 22.82.030, the coverage of this Chapter shall be determined in accordance with the scope and application section of either the Residential Compliance Manual or Nonresidential Compliance Manual, as appropriate for the proposed occupancy.

§ 22.82.040 Compliance.

A building permit application subject to the requirements of this Chapter will not be issued a building permit by the Building Official unless the energy compliance documentation submitted with the permit application complies with the requirements of this Chapter. A final inspection for a building permit subject to the requirements of this Chapter will not be approved unless the work authorized by the building permit has been constructed in accordance with the approved plans, conditions of approvals, and requirements of this Chapter. (Ord. 5446, 2008.)

§ 22.82.050 Mandatory Energy Efficiency Requirements.

In addition to meeting all requirements of 2005 Building Energy Efficiency Standards, all applications for building permits that include buildings or improvements covered by this Chapter shall include the following mandatory energy efficiency measures as may be applicable to the proposed building or improvement:

A. RESIDENTIAL BUILDINGS.

Any appliance (excluding HVAC equipment and water heaters) to be installed in a residential building shall be Energy Star rated, if the appliance installed is of a type that is Energy Star rated.

B. SWIMMING POOL AND SPA HEATERS AND PUMPS.

Any heater or circulation pump to be installed for any swimming pool, spa, or water feature shall incorporate the following energy conservation features:

1. All natural gas heaters shall have an annual fuel utilization efficiency of 90% or higher; and
2. All circulating pump motors and filtration pump motors with a nominal rating of 0.75 horsepower or greater (except pump motors only serving spa jets) shall be two-speed or variable speed motors. The installation of all two-speed and variable speed motors shall include the installation of a controller which shall be time-based and shall be programmed to alternate the speed of the motor between low and high to make effective use of the energy savings potential of the unit's multi-speed capability. 436-1 rev. 3/31/08

C. MECHANICAL HEATING OR COOLING SYSTEMS.

All fan motors and pump motors associated with mechanical heating or cooling systems that are single-speed, poly-phase, 1.0 nominal horsepower to 500 nominal horsepower, 2-, 4-, and 6-pole squirrel cage induction, NEMA Design A or B, continuous duty-rated motors must be NEMA Premium motors by the National Electrical Manufacturers Association.

§ 22.82.060 General Compliance Requirements.

In addition to any applicable mandatory requirements specified in Section 22.82.050 and the requirements of the 2005 Building Energy Efficiency Standards, the following general compliance requirements shall apply to permit applications subject to this Chapter as follows:

A. LOW-RISE RESIDENTIAL BUILDINGS.

Applications for building permits that involve new low-rise residential buildings or additions to existing low-rise residential buildings where the additions are greater than 100 square feet of conditioned floor area shall demonstrate compliance with the general compliance requirements as follows:

1. **New Low-Rise Residential Buildings.** When an application for a building permit involves a new low-rise residential building, the performance approach specified in Section 151 of the 2005 Building Energy Efficiency Standards must be used to demonstrate that the TDV Energy of the proposed building is at least 20.0% less than the TDV Energy of the standard building.
2. **Additions to Low-Rise Residential Buildings.** When an application for a building permit involves an addition to an existing low-rise residential building, this general compliance requirement may be met by either of the following methods:

a. Using the performance approach specified in Section 151 of the 2005 Building Energy Efficiency Standards to demonstrate that the TDV Energy of the proposed addition is at least 20.0% less than the TDV Energy of the standard design, or

b. Using the “Existing + Addition + Alteration” calculation methodology to demonstrate that the TDV Energy of the proposed building is at least 20.0% less than the TDV Energy of the standard design, as calculated in accordance with the performance approach specified in Section 151 of the 2005 Building Energy Efficiency Standards. In modeling buildings under the Existing + Addition + Alteration method, domestic hot water energy use must be included in the calculation model unless the application does not involve a change to the building’s existing water heater(s).

B. HIGH-RISE RESIDENTIAL BUILDINGS.

Applications for building permits that involve new high-rise residential buildings or additions to existing high-rise residential buildings where the additions are greater than 100 square feet of conditioned floor area shall demonstrate compliance with the general compliance requirements as follows:

1. New High-Rise Residential Buildings. When an application for a building permit involves a new high-rise residential building, the applicant shall use either the Prescriptive Approach or the Performance Approach to demonstrate compliance as specified below:

a. Prescriptive Approach. If the building permit applicant chooses the prescriptive approach, the applicant shall use the Overall Envelope Approach in specified in Section 143(b) of the 2005 Building Energy Efficiency Standards to demonstrate that the Overall Heat Gain of the proposed building is at least 10.0% less than the Overall Heat Gain of the standard building; and the Overall Heat Loss of the proposed building is at least 10.0% less than the Overall Heat Loss of the standard building.

b. Performance Approach. If the applicant chooses the performance approach, the applicant shall select one of the following energy budget calculation methodologies to demonstrate compliance with the general compliance requirements:

(1) Building Envelope Only. Model the building envelope only using a state-approved energy compliance software program and demonstrate that the TDV Energy of the sum of the Space Heating, Space Cooling and Indoor Fans energy components of the proposed building is at least 15.0% less than the TDV Energy of the sum of the Space Heating, Space Cooling and Indoor Fans energy components of the standard building; or,

(2) Building Envelope and Mechanical System. Model the building envelope and mechanical system using a state-approved energy compliance software program and demonstrate that the TDV Energy of the sum of the Space Heating, Space Cooling, Indoor Fans, Pump and Heat Rejection energy components of the proposed building is at least 15.0% less than the TDV Energy of the sum of the Space Heating, Space Cooling, Indoor Fans, Pump and Heat Rejection energy components of the standard building.

2. Additions to High-Rise Residential Buildings. When an application for a building permit involves an addition to an existing high-rise residential building, this general compliance requirement may be met by either of the following methods:

a. Using the performance approach specified in Section 151 of the 2005 Building Energy Efficiency Standards to demonstrate that the TDV Energy of the proposed addition is at least 15.0% less than the TDV Energy of the standard design, or

b. Using the “Existing + Addition + Alteration” calculation method to demonstrate that the TDV Energy for the sum of the energy components for the proposed building specified in either b (1) or b (2) above is at least 15.0% less than the TDV Energy for the sum of the same energy components of the standard design.

C. NONRESIDENTIAL AND HOTEL/MOTEL OCCUPANCIES.

Applications for building permits that involve new nonresidential buildings or hotel/motel occupancies or additions to existing nonresidential buildings or hotel/motel occupancies where the additions are greater than 100 square feet of conditioned floor area shall demonstrate compliance with the general compliance requirements as follows: 436-2 rev. 3/31/08

1. New Nonresidential Buildings or Hotel/Motel Occupancies. When an application for a building permit involves a new nonresidential building or a new building housing a hotel/motel occupancy, compliance with the general compliance requirements established by this Chapter may be demonstrated by using either the prescriptive approach or performance approach as specified below:

a. Prescriptive Approach. Subject to the exceptions listed below and the provisions of the 2005 Building Energy Efficiency Standards, the prescriptive approach requires compliance with the prescriptive envelope requirement and/or the prescriptive indoor lighting requirement, depending upon the work proposed in the permit application, as specified below:

(1) Prescriptive Envelopment Requirement. The Overall Envelope Approach in Section 143(b) of the 2005 Building Energy Efficiency Standards shall be used to demonstrate that the Overall Heat Gain of the proposed building is at least 10.0% less than the Overall Heat Gain of the standard building; and the Overall Heat Loss of the proposed building is at least 10.0% less than the Overall Heat Loss of the standard building, and

(2) Prescriptive Indoor Lighting Requirement. The “Prescriptive Requirements for Indoor Lighting” contained in Section 146 of the 2005 Building Energy Efficiency Standards that apply to conditioned spaces shall be used to demonstrate that the Adjusted Actual (Installed) Watts are at least 10.0% less than the Total Allowed Watts.

(i) Tailored Method Exception. When using the Tailored Method in retail stores to determine compliance with the prescriptive requirements for indoor lighting, Display Lighting watts may be omitted from the above calculation.

(ii) Small Alterations Exception. Lighting alterations, which encompass a gross conditioned floor area equal to or less than 100 square feet are exempt from the prescriptive indoor lighting requirement.

b. Performance Approach. When using the performance approach to demonstrate compliance with the general compliance requirements, the permit applicant shall select one of the following calculation methodologies:

(1) Building Envelope Only. Model the building envelope only for compliance using a state-approved energy compliance software program and demonstrate that the TDV Energy of the sum of the Space Heating, Space Cooling and Indoor Fans energy components of the proposed building is at least 10.0% less than the TDV Energy of the sum of the Space Heating, Space Cooling and Indoor Fans energy components of the standard building; or,

(2) Building Envelope and Mechanical System. Model the building envelope and mechanical system for compliance using a state-approved energy compliance software program and demonstrate that the TDV Energy of the sum of the Space Heating, Space Cooling, Indoor Fans, Pump and Heat Rejection energy components of the proposed building is at least 10.0% less than the TDV Energy of the sum of the Space Heating, Space Cooling, Indoor Fans, Pump and Heat Rejection energy components for the standard building, or,

(3) Building Envelope and Lighting. Model the building envelope and lighting for compliance using a state-approved energy compliance software program and demonstrate that the TDV Energy of the sum of the Space Heating, Space Cooling, Indoor Fans and Lighting energy components of the proposed building is at least 10.0% less than the TDV Energy of the sum of the Space Heating, the Space Cooling, Indoor Fans and Lighting energy components of the standard building; or,

(4) Building Envelope, Lighting, and Mechanical System. Model the building envelope, lighting and mechanical system for compliance using a state-approved energy compliance software program and demonstrate that the TDV Energy of the sum of the Space Heating, Space Cooling, Lighting, Indoor Fans, Pump and Heat Rejection energy components of the proposed building is at least 10.0% less than the TDV Energy of the sum of the Space Heating, Space Cooling, Lighting, Indoor Fans, Pump and Heat Rejection energy components of the standard building.

2. Additions to Existing Nonresidential Buildings or Hotel/Motel Occupancies. When an application for a building permit involves an addition to an existing nonresidential building or an existing building housing a hotel/motel occupancy, this general compliance requirement may be met by either of the following methods:

a. Using one of the performance approach methodologies specified above in subparagraph 1.b above to demonstrate that the TDV Energy of the sum of the energy components for the proposed addition specified in any one of the paragraphs 1.b(1)-(4) above is at least 10.0% less than the sum of the same energy components of the standard design, or

b. Using the “Existing + Addition + Alteration” calculation method to demonstrate that the TDV Energy of the sum of the energy components for the proposed building specified in any one of the paragraphs 1.b. (1)-(4) above is at least 10.0% less than the sum of the same energy components of the standard design.

D. DOCUMENTATION.

In order to demonstrate compliance with the requirements of this Section, a permit applicant may be required to submit supplementary forms and documentation in addition to the building drawings, specifications, and standard Title 24 report forms, as deemed appropriate by the Building Official.

§ 22.82.070 Credit for Solar Photovoltaic Energy Systems.

A. NOT ALLOWED TO DEMONSTRATE COMPLIANCE WITH STATE STANDARDS.

A photovoltaic TDV Energy credit shall not be used to demonstrate compliance with the 2005 Building Energy Efficiency Standards.

B. CREDIT ALLOWED TO SATISFY A PORTION OF THE GENERAL COMPLIANCE REQUIREMENTS.

A photovoltaic credit may be used to reduce the TDV Energy use of a proposed building or addition in order to satisfy the general compliance requirements of this Chapter as follows:

1. **Low-Rise Residential Buildings.** An application for a new low-rise residential building or an addition to an existing low-rise residential building may use a photovoltaic credit in order to demonstrate compliance with the general compliance requirements of this Chapter only after the TDV Energy of the proposed building or addition, calculated without the photovoltaic credit, is at least 15.0% less than the TDV Energy of the standard building or design.

2. **High-Rise Residential Buildings.** An application for a new high-rise residential building or an addition to an existing high-rise residential building may use a photovoltaic credit in order to demonstrate compliance with the general compliance requirements of this Chapter only after the TDV Energy of the proposed building or addition, calculated without the photovoltaic credit, is at least 10.0% less than the TDV Energy of the standard building or design.

3. **Nonresidential Buildings and Hotel/Motel Occupancies.** An application for a new nonresidential building or a new hotel/motel occupancy or an addition to an existing

nonresidential building or an existing hotel/motel occupancy may use a photovoltaic credit in order to demonstrate compliance with the general compliance requirements of this Chapter only after the TDV Energy of the proposed building or addition, calculated without the photovoltaic credit, is at least 5.0% less than the TDV Energy of the standard building or design.

C. CALCULATION OF PHOTOVOLTAIC CREDIT.

1. Performance Approach Required. In order to request a photovoltaic credit pursuant to this Section, an applicant for a building permit must use an applicable performance approach methodology specified in Section 22.82.050 to demonstrate compliance with the general compliance requirements of this Chapter.

2. Calculation Inputs. When using the CECPV Calculator to calculate a photovoltaic credit, the permit applicant shall input "Site-Specific Detailed Input" including roof pitch (or tilt), the azimuth and the site shading conditions.

3. Documentation. In order to receive a photovoltaic credit, an applicant for a building permit must include a copy of the CF-1R-PV form generated by the CECPV Calculator on the plans submitted for a building permit.

§ 22.82.080 Expiration.

This Chapter 22.82 shall expire upon the date that the state's 2008 Building Energy Efficiency Standards take effect.