DOCKETED	
Docket Number:	17-BSTD-03
Project Title:	2019 Title 24, Part 11, CALGreen Rulemaking
TN #:	225060
Document Title:	Memo with Signed Form 399 for the 2019 CALGreen Code, Title 24, Part 11
Description:	Includes cover page, explanatory memorandum and language.
Filer:	Adrian Ownby
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	10/22/2018 2:09:19 PM
Docketed Date:	10/22/2018

State of California

California Natural Resources Agency

Memorandum

To: Bryan Cash
Assistant Secretary for Administration and Finance

Date: July 16, 2018

From: **Drew Bohan**
Executive Director
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5512

Subject: **STANDARD FORM 399 FOR CALIFORNIA GREEN BUILDING STANDARDS CODE RULEMAKING PROCEEDING**

Attached for your approval and signature is the Form 399 in support of a rulemaking proceeding for the California Green Building Standards Code, Title 24, Part 11. This rulemaking will update existing voluntary energy efficiency standards for newly constructed buildings, as well as additions and alterations to existing buildings. Once approved, the form will be provided to the Office of Administrative Law to initiate the public notice for the rulemaking.

If you have any questions regarding the content or the processing of this form, please contact Adrian Ownby, Energy Commission Specialist III, at 916-651-3008.

Attachment

cc: Christopher Meyer, ER Specialist III (Manager)
Payam Bozorgchami, Senior Civil Engineer
Adrian Ownby, EC Specialist III (Eff)

STATE OF CALIFORNIA — DEPARTMENT OF FINANCE

ECONOMIC AND FISCAL IMPACT STATEMENT (REGULATIONS AND ORDERS)

STD. 399 (REV. 12/2013)

ECONOMIC IMPACT STATEMENT

DEPARTMENT NAME	CONTACT PERSON	EMAIL ADDRESS	TELEPHONE NUMBER
California Energy Commission	Adrian Ownby	adrian.ownby@energy.ca	916-651-3008

DESCRIPTIVE TITLE FROM NOTICE REGISTER OR FORM 400	NOTICE FILE NUMBER
Revisions to the California Green Building Standards Code (CALGreen Code)	Z

A. ESTIMATED PRIVATE SECTOR COST IMPACTS *Include calculations and assumptions in the rulemaking record.*

1. Check the appropriate box(es) below to indicate whether this regulation:

- [X] a. Impacts business and/or employees
- [X] b. Impacts small businesses
- [X] c. Impacts jobs or occupations
- [X] d. Impacts California competitiveness
- [X] e. Imposes reporting requirements
- [X] f. Imposes prescriptive instead of performance
- [X] g. Impacts individuals
- [X] h. None of the above (Explain below): Energy efficiency provisions of the CALGreen Code are voluntary.

If any box in Items 1 a through g is checked, complete this Economic Impact Statement.
If box in Item 1.h. is checked, complete the Fiscal Impact Statement as appropriate.

2. The California Energy Commission (Agency/Department) estimates that the economic impact of this regulation (which includes the fiscal impact) is:

- [ ] Below $10 million
- [ ] Between $10 and $25 million
- [ ] Between $25 and $50 million
- [ ] Over $50 million *[If the economic impact is over $50 million, agencies are required to submit a Standardized Regulatory Impact Assessment as specified in Government Code Section 11346.3(c)]*

3. Enter the total number of businesses impacted: unknown

Describe the types of businesses (Include nonprofits): potentially all types of businesses could be impacted

Enter the number or percentage of total businesses impacted that are small businesses: unknown

4. Enter the number of businesses that will be created: unknown eliminated: unknown

Explain: The energy efficiency provisions of the CALGreen Code are voluntary and therefore have no definable impact.

5. Indicate the geographic extent of impacts:
- [ ] Statewide
- [X] Local or regional (List areas): Unknown, must be enacted locally to have effect.

6. Enter the number of jobs created: unknown and eliminated: unknown

Describe the types of jobs or occupations impacted: The energy efficiency provisions of the CALGreen Code are voluntary and therefore have no definable impact.

7. Will the regulation affect the ability of California businesses to compete with other states by making it more costly to produce goods or services here? [X] YES [ ] NO

If YES, explain briefly:

STATE OF CALIFORNIA — DEPARTMENT OF FINANCE

ECONOMIC AND FISCAL IMPACT STATEMENT
(REGULATIONS AND ORDERS)

STD. 399 (REV. 12/2013)

ECONOMIC IMPACT STATEMENT (CONTINUED)

B. ESTIMATED COSTS *Include calculations and assumptions in the rulemaking record.*

1. What are the total statewide dollar costs that businesses and individuals may incur to comply with this regulation over its lifetime? $ unknown

   a. Initial costs for a small business: $ unknown Annual ongoing costs: $ unknown Years: unknown

   b. Initial costs for a typical business: $ unknown Annual ongoing costs: $ unknown Years: unknown

   c. Initial costs for an individual: $ unknown Annual ongoing costs: $ unknown Years: unknown

   d. Describe other economic costs that may occur: The energy efficiency provisions of the CALGreen Code are voluntary and therefore have no definable impact.

2. If multiple industries are impacted, enter the share of total costs for each industry: Nonresidential Construction (unknown %), Residential Construction (unknown %)

3. If the regulation imposes reporting requirements, enter the annual costs a typical business may incur to comply with these requirements. *Include the dollar costs to do programming, record keeping, reporting, and other paperwork, whether or not the paperwork must be submitted.* $

4. Will this regulation directly impact housing costs? ☒ YES ☐ NO

   If YES, enter the annual dollar cost per housing unit: $ unknown

   Number of units: unknown

5. Are there comparable Federal regulations? ☐ YES ☒ NO

   Explain the need for State regulation given the existence or absence of Federal regulations: Federal regulations do not apply to state, local and private sector construction in California.

   Enter any additional costs to businesses and/or individuals that may be due to State - Federal differences: $

C. ESTIMATED BENEFITS *Estimation of the dollar value of benefits is not specifically required by rulemaking law, but encouraged.*

1. Briefly summarize the benefits of the regulation, which may include among others, the health and welfare of California residents, worker safety and the State's environment: Individuals and businesses may benefit from the reduction in energy costs. Businesses that provide energy efficiency products and services may experience an increase in business. All state and local government agencies and their tenants may benefit.

2. Are the benefits the result of: ☒ specific statutory requirements, or ☐ goals developed by the agency based on broad statutory authority?

   Explain:

3. What are the total statewide benefits from this regulation over its lifetime? $ unknown

4. Briefly describe any expansion of businesses currently doing business within the State of California that would result from this regulation: California businesses producing energy efficiency products/technologies that meet or exceed the proposed CALGreen Code will likely expand their sales of those products/technologies due to the voluntary implementation of the CALGreen Code.

D. ALTERNATIVES TO THE REGULATION *Include calculations and assumptions in the rulemaking record. Estimation of the dollar value of benefits is not specifically required by rulemaking law, but encouraged.*

1. List alternatives considered and describe them below. If no alternatives were considered, explain why not: The energy efficiency provisions of the CALGreen Code are voluntary and therefore have no definable impact.

ECONOMIC IMPACT STATEMENT (CONTINUED)

2. Summarize the total statewide costs and benefits from this regulation and each alternative considered:

Regulation: Benefit: $ unknown Cost: $ unknown

Alternative 1: Benefit: $ _____ Cost: $ _____

Alternative 2: Benefit: $ _____ Cost: $ _____

3. Briefly discuss any quantification issues that are relevant to a comparison of estimated costs and benefits for this regulation or alternatives: _____

4. Rulemaking law requires agencies to consider performance standards as an alternative, if a regulation mandates the use of specific technologies or equipment, or prescribes specific actions or procedures. Were performance standards considered to lower compliance costs? ☒ YES ☐ NO

Explain: Performance Standards are a fundamental part of the proposed energy efficiency provisions of the CALGreen Code.

E. MAJOR REGULATIONS *Include calculations and assumptions in the rulemaking record.*

California Environmental Protection Agency (Cal/EPA) boards, offices and departments are required to submit the following (per Health and Safety Code section 57005). Otherwise, skip to E4.

1. Will the estimated costs of this regulation to California business enterprises **exceed $10 million**? ☐ YES ☐ NO

If YES, complete E2. and E3
If NO, skip to E4

2. Briefly describe each alternative, or combination of alternatives, for which a cost-effectiveness analysis was performed:

Alternative 1: _____

Alternative 2: _____

(Attach additional pages for other alternatives)

3. For the regulation, and each alternative just described, enter the estimated total cost and overall cost-effectiveness ratio:

Regulation: Total Cost $ _____ Cost-effectiveness ratio: $ _____

Alternative 1: Total Cost $ _____ Cost-effectiveness ratio: $ _____

Alternative 2: Total Cost $ _____ Cost-effectiveness ratio: $ _____

4. Will the regulation subject to OAL review have an estimated economic impact to business enterprises and individuals located in or doing business in California exceeding $50 million in any 12-month period between the date the major regulation is estimated to be filed with the Secretary of State through12 months after the major regulation is estimated to be fully implemented?

☐ YES ☒ NO

If YES, agencies are required to submit a Standardized Regulatory Impact Assessment (SRIA) as specified in Government Code Section 11346.3(c) and to include the SRIA in the Initial Statement of Reasons.

5. Briefly describe the following:

The increase or decrease of investment in the State: _____

The incentive for innovation in products, materials or processes: _____

The benefits of the regulations, including, but not limited to, benefits to the health, safety, and welfare of California residents, worker safety, and the state's environment and quality of life, among any other benefits identified by the agency: _____

STATE OF CALIFORNIA — DEPARTMENT OF FINANCE

ECONOMIC AND FISCAL IMPACT STATEMENT

(REGULATIONS AND ORDERS)

STD. 399 (REV. 12/2013)

FISCAL IMPACT STATEMENT

A. FISCAL EFFECT ON LOCAL GOVERNMENT *Indicate appropriate boxes 1 through 6 and attach calculations and assumptions of fiscal impact for the current year and two subsequent Fiscal Years.*

☐ 1. Additional expenditures in the current State Fiscal Year which are reimbursable by the State. (Approximate)
(Pursuant to Section 6 of Article XIII B of the California Constitution and Sections 17500 et seq. of the Government Code).

$ _____

☐ a. Funding provided in _____

Budget Act of _____ or Chapter _____, Statutes of _____

☐ b. Funding will be requested in the Governor's Budget Act of _____

Fiscal Year: _____

☐ 2. Additional expenditures in the current State Fiscal Year which are NOT reimbursable by the State. (Approximate)
(Pursuant to Section 6 of Article XIII B of the California Constitution and Sections 17500 et seq. of the Government Code).

$ _____

Check reason(s) this regulation is not reimbursable and provide the appropriate information:

☐ a. Implements the Federal mandate contained in _____

☐ b. Implements the court mandate set forth by the _____ Court.

Case of: _____ vs. _____

☐ c. Implements a mandate of the people of this State expressed in their approval of Proposition No. _____

Date of Election: _____

☐ d. Issued only in response to a specific request from affected local entity(s).

Local entity(s) affected: _____

_____

☐ e. Will be fully financed from the fees, revenue, etc. from: _____

Authorized by Section: _____ of the _____ Code;

☐ f. Provides for savings to each affected unit of local government which will, at a minimum, offset any additional costs to each;

☐ g. Creates, eliminates, or changes the penalty for a new crime or infraction contained in _____

☐ 3. Annual Savings. (approximate)

$ _____

☐ 4. No additional costs or savings. This regulation makes only technical, non-substantive or clarifying changes to current law regulations.

☐ 5. No fiscal impact exists. This regulation does not affect any local entity or program.

☒ 6. Other. Explain The energy efficiency provisions of the CALGreen Code are voluntary and must be enacted locally to have any effect.

STATE OF CALIFORNIA — DEPARTMENT OF FINANCE

ECONOMIC AND FISCAL IMPACT STATEMENT
(REGULATIONS AND ORDERS)

STD. 399 (REV. 12/2013)

FISCAL IMPACT STATEMENT (CONTINUED)

B. FISCAL EFFECT ON STATE GOVERNMENT *Indicate appropriate boxes 1 through 4 and attach calculations and assumptions of fiscal impact for the current year and two subsequent Fiscal Years.*

☐ 1. Additional expenditures in the current State Fiscal Year. (Approximate)

$ _____

It is anticipated that State agencies will:

☐ a. Absorb these additional costs within their existing budgets and resources.

☐ b. Increase the currently authorized budget level for the _____ Fiscal Year

☐ 2. Savings in the current State Fiscal Year. (Approximate)

$ _____

☐ 3. No fiscal impact exists. This regulation does not affect any State agency or program.

☒ 4. Other. Explain The energy efficiency provisions of the CALGreen Code are voluntary and must be enacted locally to have any effect.

C. FISCAL EFFECT ON FEDERAL FUNDING OF STATE PROGRAMS *Indicate appropriate boxes 1 through 4 and attach calculations and assumptions of fiscal impact for the current year and two subsequent Fiscal Years.*

☐ 1. Additional expenditures in the current State Fiscal Year. (Approximate)

$ _____

☐ 2. Savings in the current State Fiscal Year. (Approximate)

$ _____

☐ 3. No fiscal impact exists. This regulation does not affect any federally funded State agency or program.

☒ 4. Other. Explain The energy efficiency provisions of the CALGreen Code are voluntary and must be enacted locally to have any effect.

FISCAL OFFICER SIGNATURE	DATE

The signature attests that the agency has completed the STD. 399 according to the instructions in SAM sections 6601-6616, and understands the impacts of the proposed rulemaking. State boards, offices, or departments not under an Agency Secretary must have the form signed by the highest ranking official in the organization.

AGENCY SECRETARY	DATE
	8/20/2018

Finance approval and signature is required when SAM sections 6601-6616 require completion of Fiscal Impact Statement in the STD. 399.

DEPARTMENT OF FINANCE PROGRAM BUDGET MANAGER	DATE
	10/19/18

ATTACHMENT TO
FULLY EXECUTED ECONOMIC IMPACT STATEMENT
July 16, 2018

All California Energy Commission mandatory building energy efficiency regulations are found in provisions of the California Building Code, Parts 1 and 6 (the Energy Code). The California Energy Commission cannot provide any estimated costs or claim any estimated savings for the voluntary building energy efficiency provisions in the California Building Code, Part 11 (CALGreen Code). By definition the CALGreen energy efficiency provisions have no force or impact unless they are imposed by a local jurisdiction through the passage of a local ordinance. Without the force of a local ordinance, no savings or costs can be realized or claimed by any government agency. The act of enacting a local ordinance places the responsibility for the associated costs and savings on the locality that passes the ordinance.

At practical level, any attempt to estimate the costs and savings associated with the CALGreen voluntary provisions faces significant technical challenges. Any credible estimate of the statewide costs and savings impact from the CALGreen voluntary provisions would require defensible assumptions or data regarding the following:

- The number of local jurisdictions that will impose some level of mandatory building energy efficiency requirements that are more stringent than the Energy Code, based on the CALGreen voluntary provisions. It is important to emphasize that last part – "based on the CALGreen voluntary provisions"— because not all local ordinances that implement beyond code requirements follow the recommendations made in the CALGreen code. Past local ordinance enactments cannot be credibly used to estimate this because the Energy Code becomes increasingly stringent with each code cycle, leaving fewer and fewer opportunities to exceed its requirements. The proposed 2019 Energy Code will require many newly constructed residential buildings to be relatively close to zero net energy. Whatever measure requirements are enacted locally under the 2019 Energy Code will be significantly different than those enacted under the 2016 Energy Code. Past data on the impact of CALGreen voluntary measures implemented locally have no relevance or predictive validity for CALGreen measures that will be implemented locally under the 2019 Energy Code.
- The extent to which those local jurisdictions will impose CALGreen voluntary provisions as requirements beyond the Energy Code. As noted in the previous bullet above the proposed 2019 Energy Code will require many newly constructed residential buildings to be nearly zero net energy. However, a local jurisdiction may require beyond code energy efficient construction across a spectrum – bounded by just beyond the Energy Code at one end and zero net energy (or beyond that, "carbon neutral") construction at the other.

- The technology those local jurisdictions would require builders implement in order to meet their beyond Energy Code requirements. Buildings are complicated "systems" and there are multiple methods or technologies that might be implemented to increase a building's energy efficiency beyond the current Energy Code requirements.

DOCKETED	
Docket Number:	17-BSTD-03
Project Title:	2019 Title 24, Part 11, CALGreen Rulemaking
TN #:	222226
Document Title:	45-day Express Terms 2019 CALGreen Voluntary Provisions
Description:	Appendix A4
Filer:	Adrian Ownby
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	1/18/2018 4:43:52 PM
Docketed Date:	1/18/2018

APPENDIX A4

RESIDENTIAL VOLUNTARY MEASURES

Division A4.2 – ENERGY EFFICIENCY

SECTION A4.201

GENERAL

A4.201.1 Scope.

For the purposes of mandatory energy efficiency standards in this code, the California Energy Commission will continue to adopt mandatory standards. It is the intent of these voluntary provisions to encourage local jurisdictions through codification to achieve exemplary performance in the area of building energy efficiency. Local jurisdictions adopting these voluntary provisions as mandatory local energy efficiency standards shall submit the required application and receive the required approval of the California Energy Commission in compliance with Chapter 10, Section 106 of the *California Administrative Code*, prior to enforcement. Once approval is granted by the Energy Commission, local jurisdictions shall file an ordinance expressly marking the local modification along with findings and receive the required acceptance from the California Building Standards Commission in compliance with Section 101.7 of this code, prior to enforcement. (Chapter 10, Section 106 of the *California Administrative Code* is available at http://www.energy.ca.gov/title24/2016standards/)

SECTION A4.202

DEFINITIONS

A4.202.1 Definitions. The following terms are defined in Chapter 2.

ENERGY BUDGET.

ENERGY DESIGN RATING~~.~~ (EDR).

ENERGY DESIGN RATING, ENERGY EFFICIENCY

ENERGY DESIGN RATING, SOLAR ELECTRIC GENERATION AND DEMAND FLEXIBILITY

ENERGY DESIGN RATING, TOTAL

TIME DEPENDENT VALUATION (TDV) ENERGY.

SECTION A4.203

PERFORMANCE APPROACH FOR NEWLY CONSTRUCTED BUILDINGS

A4.203.1 Energy efficiency. Newly constructed low-rise residential buildings shall comply with Sections A4.203.1.1 ~~and either,~~ A4.203.1.2~~.1,~~, AND A4.203.1~~.2.2 or A4.203.1.2~~.3.

A4.203.1.1 Tier 1, and Tier 2, ~~and zero net energy design~~ prerequisites. ~~Each of the following efficiency measures is~~A4.203.1.1.1 Energy design ratings AND A4.203.1.1.2 Quality Insulation Installation are required for all applicable components of the building project.

A4.203.1.1.1 Energy design ~~rating. An energy design rating~~ratings: Total Energy Design Rating (Total EDR) and Energy Efficiency Design Rating (Efficiency EDR). Total EDR and Efficiency EDR ratings for the Proposed Design Building shall be computed by Compliance Software certified by the Energy Commission ~~and this rating~~as described in the Building Energy Efficiency Standards Section 100.1 and these ratings shall be included in the Certificate of Compliance documentation.

A4.203.1.1.2 Quality Insulation Installation (QII). The QII procedures specified in the Building Energy Efficiency Standards Reference Residential Appendix RA3.5 shall be completed.

A4.203.1.2 Tier 1 and Tier 2 prerequisite options. In addition ONE of the following efficiency measures will be required: A4.203.1.2.1 Roof deck insulation, or ducts in conditioned space OR A4.203.1.2.2 High Performance Walls OR A4.203.1.2.3 HERS-Verified Compact Hot Water Distribution System with Drain Water Heat Recovery.

A4.203.1.2.1 Roof deck insulation, or ducts in conditioned space. Meet one of the three options for the location of ducts and air handler as well as insulation R values and installation of a radiant barrier as specified in the Building Energy Efficiency Standards Section 150.1(c)9A or B:

1) Below roof deck insulation with a minimum R-value of 19; or,
2) Continuous above deck insulation with a minimum R-8; or,
3) Ducts in conditioned space.

A4.203.1.2.2 High Performance Walls (HPW). HPW meet the climate zone dependent U-factor and insulation values for either 2x6 or 2x4 framing as specified in the Building Energy Efficiency Standards Section 150.1(c)1B: maximum U-factor of 0.048.

A4.203.1.2.3 HERS-Verified Compact Hot Water Distribution System (CHWDS-H) with Drain Water Heat Recovery (DWHR-H). CHWDS-H shall be installed as specified in RA3.6.5 and RA4.4.16. DWHR-H shall be installed as specified in RA3.6.9 and RA4.4.21.

A4.203.1.3 Performance standard. Comply with one of the advanced efficiency levels, either A4.201.1.3.1 OR A4.201.1.3.2, indicated below.

A4.203.1.~~2~~3.1 Tier 1. Buildings complying with the first level of advanced energy efficiency shall have ~~either an Energy Budget that is no greater than 85 percent of the Title 24, Part 6 Energy Budget for the Standard Design Building, or an Energy Design Rating showing a 15% or greater reduction in its Energy Budget component compared to the Standard Design Building,~~additional integrated efficiency and on-site renewable energy generation sufficient to achieve a Total EDR of 14 or lower as calculated by Title 24, Part 6 Compliance Software approved by the Energy Commission. This requirement is in addition to meeting the minimum mandatory Efficiency EDR as specified by the same software in Part 6. Measures considered to meet the Total EDR targets calculated by the compliance software may include prerequisite

options above, use of Demand Response (e.g. load following), additional energy efficiency measures (e.g. triple pane windows), as well as onsite electric battery and/or thermal storage.

A4.203.1.~~2~~3.2 Tier 2. Buildings complying with ~~the~~this second ~~level of advanced energy efficiency shall have either an Energy Budget that is no greater than 70 percent of the Title 24, Part 6 Energy Budget for the Standard Design Building, or an Energy Design Rating showing a 30% or greater reduction in its Energy Budget component compared to the Standard Design Building,~~elective designation shall have additional integrated efficiency and on-site renewable energy generation sufficient to achieve a Total EDR of six or lower as calculated by Title 24, Part 6 Compliance Software approved by the Energy Commission. This may be reached by various paths including electrifying space and water heating, advanced electric battery controls, as well as modest oversizing of the photovoltaic system. The Total EDR is in addition to meeting the minimum mandatory Efficiency EDR as specified by the same software in Part 6.

~~**A4.203.1.2.3 Zero net energy design.** Buildings complying with this elective designation shall have on-site renewable energy generation sufficient to achieve an Energy Design Rating of zero (0) as calculated by Title 24, Part 6 Compliance Software approved by the Energy Commission, and:~~

~~1. Single-family buildings in Climate Zones 6 and 7, and low-rise multifamily buildings in Climate Zone 3, 5, 6, and 7 shall comply with Section A4.203.1.2.1 (Tier 1); and~~

~~2. Single-family buildings in Climate Zones 1 through 5 and 8 through 16 and low-rise multifamily building in Climate Zones 1, 2, 4, and 8 through 16 shall comply with Section A4.203.1.2.2 (Tier 2).~~

~~Note:~~

~~For Energy Budget calculations, high-rise residential and hotel/motel buildings are considered nonresidential buildings.~~

~~SECTION A4.204~~

~~PERFORMANCE APPROACH FOR ADDITIONS~~

~~**A4.204.1 Energy efficiency.** Additions to low-rise residential buildings shall comply with Section A4.204.1.1 or A4.204.1.2.~~

~~**A4.204.1.1 Tier 1.** Buildings complying with the first level of advanced energy efficiency shall have an Energy Budget that is no greater than indicated below, depending on the number of mechanical systems added. Space heating systems, space cooling systems and water heating systems are each separate mechanical systems for the purpose of complying with this requirement. If the addition changes only the envelope with no change to any mechanical system, then no additional performance requirements above Title 24, Part 6 are required.~~

~~1. For one and only one mechanical system: No greater than 95 percent of the Title 24, Part 6 Energy Budget for the Standard Design Building as calculated by Compliance Software certified by the Energy Commission.~~

~~2. For two or more mechanical systems: No greater than 90 percent of the Title 24, Part 6 Energy Budget for the Standard Design Building as calculated by Compliance Software certified by the Energy Commission.~~

~~**A4.204.1.2 Tier 2.** Buildings complying with the second level of advanced energy efficiency shall have an Energy Budget that is no greater than indicated below, depending on the number of mechanical systems added. Space heating systems, space cooling systems and water heating systems are each separate mechanical systems for the purpose of complying with this requirement. If the addition changes only the envelope with no change to any mechanical system, then no additional performance requirements above Title 24, Part 6 are required.~~

~~1. For one and only one mechanical system: No greater than 90 percent of the Title 24, Part 6 Energy Budget for the Standard Design Building as calculated by Compliance Software certified by the Energy Commission.~~

~~2. For two or more mechanical systems: No greater than 85 percent of the Title 24, Part 6 Energy Budget for the Standard Design Building as calculated by Compliance Software certified by the Energy Commission.~~

Note:
For Energy Budget calculations, high-rise residential and hotel/motel buildings are considered nonresidential buildings.

NOTE: Authority: Sections 25213, 25218, 25218.5, 25402 and 25402.1, Public Resources Code. Reference: Sections 25402, 25402.1, 25402.4, and 25402.8, Public Resources Code

APPENDIX A5

NONRESIDENTIAL VOLUNTARY MEASURES

Division A5.2 – ENERGY EFFICIENCY

SECTION A5.201

GENERAL

A5.201.1 Scope. For the purposes of mandatory energy efficiency standards in this code, the California Energy Commission will continue to adopt mandatory standards. It is the intent of these voluntary provisions to encourage local jurisdictions through codification to achieve exemplary performance in the area of building energy efficiency. Local jurisdictions adopting these voluntary provisions as mandatory local energy efficiency standards shall submit the required application and receive the required approval of the California Energy Commission in compliance with Chapter 10, Section 106 of the *California Administrative Code*, prior to enforcement. Once approval is granted by the Energy Commission, local jurisdictions shall file an ordinance expressly marking the local modifications along with findings and receive the required acceptance from the California Building Standards Commission in compliance with Section 101.7 of this code, prior to enforcement. (Chapter 10, Section 106 of the *California Administrative Code* is available at http://www.energy.ca.gov/title24/2016standards/)

SECTION A5.202

DEFINITIONS

A5.202.1 Definitions. The following terms are defined in Chapter 2.

ENERGY BUDGET.

GEOTHERMAL.

PROCESS.

SOLAR ACCESS.

TIME DEPENDENT VALUATION (TDV).

SECTION A5.203

PERFORMANCE APPROACH

A5.203.1 Energy efficiency. Nonresidential, high-rise residential and hotel/motel buildings that include lighting and/or mechanical systems shall comply with Sections A5.203.1.1 and ~~either~~ A5.203.1.2.~~1 or A5.203.1.2.2.~~ Newly constructed buildings and additions are included in the scope of these sections. Buildings permitted without lighting or mechanical systems shall comply with Section A5.203.1.1 but are not required to comply with ~~Sections A5.203.1.1.2 or~~Section A5.203.1.2.

A5.203.1.1 Tier 1 and Tier 2 prerequisites. ~~Each~~To comply with Tier 1 ONE of the following efficiency measures is required for all applicable components of the building project. To comply with Tier 2, TWO of the following efficiency measures are required.

A5.203.1.1.1 Outdoor lighting. Newly installed outdoor lighting power shall be no greater than 90 percent of the Allowed Outdoor Lighting Power~~.~~, and shall have a color temperature no higher than 3000K. The Allowed Outdoor Lighting Power calculation is specified in Title 24, Part 6, Section 140.7 "Requirements For Outdoor Lighting."

A5.203.1.1.2 Service water heating in restaurants. Newly constructed restaurants 8,000 square feet or greater and with service water heaters rated 75,000 Btu/h or greater shall install a solar water-heating system with a minimum solar savings fraction of 0.15.

Exceptions:

1. Buildings with a natural gas service water heater with a minimum of 95-percent thermal efficiency.

2. Buildings where greater than 75 percent of the total roof area has annual solar access that is less than 70 percent. Solar access is the ratio of solar insolation, including shade, to the solar insolation without shade. Shading from obstructions located on the roof or any other part of the building shall not be included in the determination of annual solar access.

A5.203.1.1.3 Warehouse Dock Seal Doors Exterior loading dock doors that are adjacent to conditioned or indirectly conditioned spaces shall have dock seals or dock shelters installed. This requirement shall apply to newly constructed buildings and to loading dock doors added to existing. Dock seal doors shall have verified maximum air leakage rates as determined through the ASTM E783 field test.

A5.203.1.1.4 Daylight Redirecting Devices. Daylight Redirecting Devices shall be installed for indoor lighting systems with automatic daylighting controls as follows.

A. The product shall be permanently mounted on a clerestory which meets the requirements of Section 140.3(d)1. The clerestory onto which the daylight redirecting device is mounted shall have a VT greater than or equal to 0.50 and a head height less than or equal to one foot below a finished ceiling.
B. The distance from the clerestory to any existing structures or natural objects within view of the clerestory divided by the structure or object's height above the clerestory's sill shall be greater than or equal to 0.6.

EXCEPTION Where it is documented that existing adjacent structures or natural objects within view of the vertical fenestration block direct sunlight onto the vertical fenestration between 8 a.m. and 5 p.m. for less than 500 daytime hours per year for east- and west-facing clerestories or less than 1,000 daytime hours per year for south-facing clerestories.

C. The light scattering properties of the product shall be measured according to ASTM E2387.

D. The source angles of incidence as defined in ASTM E2387 shall be 30, 50 and 70 degrees and the source incident azimuth angle shall be 90 degrees. The transmittance shall be measured at each scatter angle specified in Table 140.3-E for every increment of scatter azimuth angle specified in the table below.

DAYLIGHT REDIRECTING DEVICE TRANSMITTANCE MEASUREMENT ANGLES

Scatter Angle (degrees)	100	110	120	130	140	150	160	170	180
Scatter Azimuth Angle Increments (degrees)	Every 30	Every 22.5	Every 15	Every 15	Every 15	Every 18	Every 22.5	Every 45	One measurement

E. The minimum upper quarterspherical transmittance of the daylight redirecting device as defined in Section 100.1 shall be greater than or equal to 0.40. The minimum ratio of upper quarterspherical transmittance to lower quarterspherical transmittance shall be greater than or equal to 2.5.

A5.203.1.1.5 Exhaust Air Heat Recovery. Heat recovery requirements based on ASHRAE 90.1 Section 6.5.6.1 are adapted and modified for California climate zones as described below.

1. Systems with minimum design outdoor air fraction of 80% or greater and supply air flow of 200 cfm or greater in climate zones 2, 9, 10, 11, 12, 13, 14, 15 shall have a heat recovery system.

2. Heat recovery systems required by this section shall result in a net sensible energy recovery ratio of at least 60 percent for both heating and cooling as tested using AHRI 1060-2014 or 1061-2014 and certified by AHRI. A 60 percent sensible energy recovery ratio shall mean a change in the dry-bulb of the outdoor air supply equal to 60 percent of the difference between the outdoor air and exhaust air dry-bulb at design conditions. Provisions shall be made to bypass or control the energy recovery system to permit air economizer operation as required by Section 140.4(e): Economizers.

EXCEPTION 1: Systems serving spaces that are not cooled and that are heated to less than 60°F.

EXCEPTION 2: Where more than 60 percent of the outdoor air heating energy is provided from site-recovered energy.

EXCEPTION 3: Where the sum of the airflow rates exhausted and relieved within 20 feet of each other is less than 75 percent of the design outdoor airflow rate, excluding exhaust air that is either:

1. used for another energy recovery system,

2. not allowed by ASHRAE Standard 170 for use in energy recovery systems with leakage potential, or

3. of Class 4 as defined in ASHRAE Standard 62.1.

EXCEPTION 4: Systems expected to operate less than 20 hours per week.

A5.203.1.1.6 Triple Bottom Line Analysis. A triple bottom line analysis shall be included for newly constructed buildings to evaluate the buildings expected performance in three parts: social, environmental, and financial. Current analysis requires the diminution of energy consumption and proof of cost effectiveness while this analysis also recognizes environmental justice as an important factor in new construction.

A5.203.1.2 Performance standard. Comply with one of the advanced efficiency levels indicated below.

A5.203.1.2.1 Tier 1. Buildings complying with the first level of advanced energy efficiency shall have an Energy Budget that is no greater than indicated below, depending on the type of energy systems included in the building project. If the newly constructed building or addition does not include indoor lighting or mechanical systems, then no additional performance requirements above Title 24, Part 6 are required.

1. For building projects that include indoor lighting or mechanical systems, but not both: No greater than 95 percent of the Title 24, Part 6, Energy Budget for the Standard Design Building as calculated by compliance software certified by the Energy Commission.

2. For building projects that include indoor lighting and mechanical systems: No greater than 90 percent of the Title 24, Part 6 Energy Budget for the Standard Design Building as calculated by compliance software certified by the Energy Commission.

A5.203.1.2.2 Tier 2. Buildings complying with the second level of advanced energy efficiency shall have an Energy Budget that is no greater than indicated below, depending on the type of energy systems included in the building project. If the newly constructed building or addition does not include indoor lighting or mechanical systems, then no additional performance requirements above Title 24, Part 6 are required.

1. For building projects that include indoor lighting or mechanical systems, but not both: No greater than 90 percent of the Title 24, Part 6, Energy Budget for the Standard Design Building as calculated by compliance software certified by the Energy Commission.

2. For building projects that include indoor lighting and mechanical systems:

No greater than 85 percent of the Title 24, Part 6, Energy Budget for the Standard Design Building as calculated by compliance software certified by the Energy Commission.

Note:
For Energy Budget calculations, high-rise residential and hotel/motel buildings are considered nonresidential buildings.

SECTION A5.211

RENEWABLE ENERGY

A5.211.1 On-site renewable energy. Use on-site renewable energy sources such as solar, wind, geothermal, low-impact hydro, biomass and bio-gas for at least 1 percent of the electric power calculated as the product of the building service voltage and the amperage specified by the electrical service overcurrent protection device rating or 1kW, (whichever is greater), in addition to the electrical demand required to meet 1 percent of the natural gas and propane use. The building project's electrical service overcurrent protection device rating shall be calculated in accordance with the 2016 *California Electrical Code*. Natural gas or propane use is calculated in accordance with the 2016 *California Plumbing Code*. Additional details are found in Section 10-115 of the Building Energy Efficiency Standards.

A5.211.1.1 Documentation. Using a calculation method approved by the California Energy Commission, calculate the renewable ~~onite~~onsite energy system to meet the requirements of Section A5.211.1, expressed in kW. Factor in net metering, if offered by local utility, on an annual basis.

A5.211.3 Green power. If offered by local utility provider, participate in a renewable energy portfolio program that provides a minimum of 50-percent electrical power from renewable sources. Maintain documentation through utility billings.

SECTION A5.212

ELEVATORS, ESCALATORS AND OTHER EQUIPMENT

A5.212.1 Elevators and escalators. In buildings with more than one elevator or two escalators, provide systems and controls to reduce the energy demand of elevators and escalators as follows. Document systems operation and controls in the project specifications and commissioning plan.

A5.212.1.1 Elevators. Traction elevators shall have a regenerative drive system that feeds electrical power back into the building grid when the elevator is in motion.

A5.212.1.1.1 Car lights and fan. A parked elevator shall turn off its car lights and fan automatically until the elevator is called for use.

A5.212.1.2 Escalators. An escalator shall have a VVVF motor drive system that is fully regenerative when the escalator is in motion.

A5.212.1.4 Controls. Controls that reduce energy demand shall meet requirements of CCR, Title 8, Chapter 4, Subchapter 6 and shall not interrupt emergency operations for elevators required in CCR, Title 24, Part 2, *California Building Code*.

SECTION A5.213

ENERGY EFFICIENT STEEL FRAMING

A5.213.1 Steel framing. Design steel framing for maximum energy efficiency. Techniques for avoiding thermal bridging in the envelope include:

1. Exterior rigid insulation;
2. Punching large holes in the stud web without affecting the structural integrity of the stud;
3. Spacing the studs as far as possible while maintaining the structural integrity of the structure; and
4. Detailed design of intersections of wall openings and building intersections of floors, walls and roofs.

NOTE: Authority: Sections 25213, 25218, 25218.5, 25402 and 25402.1, Public Resources Code. Reference: Sections 25402, 25402.1, 25402.4, and 25402.8, Public Resources Code