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California Energy Commission

California Energy Commission's Proposed Final Express Terms for 2025 California Green Building Code, Title 24, Part 11 (CALGreen), Appendices A4.2 & A5.2

[CEC 02/24]

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California Green Building Standards Code (CALGreen)

Title 24, Part 11, Appendices A4.2 & A5.2

Proposed Definitions

[CEC 02/24]

Section 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.~~

LONG-TERM SYSTEM COST (LSC).

ON-SITE RECOVERED ENERGY.

SOLAR POOL HEATING SYSTEM.

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

ENERGY BUDGET.

GEOTHERMAL.

LONG-TERM SYSTEM COST (LSC).

ON-SITE RECOVERED ENERGY.

PROCESS.

SOLAR ACCESS.

~~TIME DEPENDENT VALUATION (TDV).~~

SOLAR POOL HEATING SYSTEM.

Chapter 2, Section 202 – Definitions

~~**ENERGY DESIGN RATING (EDR).** The sum of the annual TDV energy consumption for energy us component included in the performance compliance approach for the Standard Design Building (Energy Budget) and the annual time-dependent valuation (TDV) energy consumption for lighting and component not regulated by Title 24, Part 6 (such as domestic appliances and consumer electronics) and accounting for the annual TDV energy offset by an on-site renewable energy system. The Design Rating is calculated by Compliance Software certified by the Energy Commission.~~

ENERGY BUDGET. ~~The sum of the annual TDV energy consumption for energy us components included in the performance compliance approach for the Standard Design Building, as established in the Alternative Calculation Method Reference Manual approved by the Energy Commission and calculated by Compliance Software certified by the Energy Commission.~~ **[CEC]**The maximum energy consumption that a proposed building, or portion of a building, can be designed to consume, calculated using CEC approved compliance software as specified in Section 10-109 of the Energy Code (Title 24, Part 6) and the Alternative Calculation Method (ACM) Reference Manual. The Energy Budget for the newly constructed buildings is expressed in terms of the Long-term System Cost (LSC) and Source Energy. The energy budget for additions and alterations is expressed in terms of LSC.

LONG-TERM SYSTEM COST (LSC). [CEC] The CEC projected present value of costs to California's energy systems over a period of 30-years. LSC does not represent a prediction of individual utility bills.

RECOVERED ENERGY. [CEC] The energy used in a building that (1) is recovered from space conditioning, service water heating, lighting, or process equipment after the energy has performed its original function; (2) provides space conditioning, service water heating, or lighting; and (3) would otherwise be wasted.

RECOVERED ENERGY, ON-SITE. [CEC] The recovered energy that is captured at the building site.

SOLAR POOL HEATING SYSTEM. [CEC] An assembly of components designated to heat water for swimming pools, spas, or swimming pool and spa combinations by solar thermal means, excluding pool recirculation components.

~~**TIME-DEPENDENT VALUATION (TDV) ENERGY.** The time-varying energy caused to be used by the building to provide space conditioning and water heating and for specified buildings lighting. TDV energy accounts for the energy used at the building site and consumed in producing and in delivering energy to a site, including, but not limited to, power generation, transmission, and distribution losses.~~

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 the *California Building Standards Code* (Title 24), the California Energy Commission will continue to adopt mandatory standards in the *California Energy Code* (Title 24, Part 6). 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 Title 24, Part 1, Section 10-106 prior to enforcement. Once the required filing has been verified and finding has been made 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. (Title 24, Part 1, Section 10-106 is available at http://www.energy.ca.gov/title24/2025standards/)

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.**~~

LONG-TERM SYSTEM COST (LSC).

ON-SITE RECOVERED ENERGY.

SOLAR POOL HEATING SYSTEM.

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 through A4.203.1.4~~3~~.

A4.203.1.1 ~~Hourly Source Energy Design Rating~~Long-term System Cost (~~EDR1~~LSC). ~~EDR1~~ LSC rating for the building's Proposed Design shall be computed by Compliance Software certified by the Energy Commission as specified in Title 24, Part 6, Section 100.1 and 150.1(b), and shall reduce the ~~EDR1~~ LSC required in the Compliance Software for minimum performance-based compliance with the *California Energy Code* by the compliance margin specified in Table A4.203.1.1. The rating shall be included in the Certificate of Compliance documentation.

TABLE A4.203.1.1
RECOMMENDED ~~EDR1~~ LSC MARGINS BY CLIMATE ZONES

CALIFORNIA ENERGY CODE CLIMATE ZONE	~~TOTAL LSCEDR1~~ COMPLIANCE MARGIN
1	~~4.3~~2.70
2	~~4.4~~1.62
3	~~6.0~~1.10
4	~~5.8~~1.11
5	~~5.8~~1.01
6	~~3.5~~0.24
7	~~2.9~~0.24
8	~~2.1~~0.21
9	~~3.6~~0.20
10	~~6.5~~0.18
11	~~4.3~~1.11
12	~~4.4~~1.05
13	~~4.9~~0.96
14	~~5.8~~1.21
15	~~1.8~~0.59
16	~~4.3~~1.68

Note: Community shared options complying with Title 24, Part 1, Section 10-115 may be used to achieve ~~EDR1~~ LSC targets.

A4.203.1.2 Prerequisite options. In addition, a minimum of TWO of the efficiency measures specified in Sections A4.203.1.2.1 through A4.203.1.2.~~8~~ 7 must be met.

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 handlers as well as insulation *R*-values and installation of a radiant barrier as specified in Title 24, Part 6, 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 and with an air space present between the roofing and the roof deck; or,
3. All ducts and air handlers in conditioned space as specified in the Title 24, Part 6, Reference Appendix RA3.1.

A4.203.1.2.2 High performance walls. Meet the climate zone dependent *U*-factor or insulation *R*-value for either 2x6 or 2x4 framing as specified in Title 24, Part 6, Section 150.1(c)1B: maximum *U*-factor of 0.048.

A4.203.1.2.3 Compact hot water distribution system. Meet the requirements for installation of Compact Hot Water Distribution Systems specified in the Title 24, Part 6, Reference Appendix RA3.6.5.

A4.203.1.2.4 Drain water heat recovery. Meet the requirements for installation of Drain Water Heat Recovery specified in Title 24, Part 6, Reference Appendix RA4.4.21.

A4.203.1.2.5 High performance vertical fenestration. Meet the climate zone dependent *U*-factor and Solar Heat Gain Co-efficient (SHGC) ~~specified~~ as rated in accordance ~~in~~with Title 24, Part 6, Section 110.6, and shall have a ~~M~~maximum *U*-factor of 0.21 in Climate Zones 1-16, maximum SHGC of 0.23 in Climate Zones ~~1~~2, 4, and 6-14~~ and 16~~, and maximum SHGC of 0.20 in Climate Zone 15.

Exception to A4.203.1.2.5: Fenestration in Climate Zones 1, 3, 5, and 16 is not required to comply with the maximum SHGC requirements.

A4.203.1.2.6 Heat pump water heater demand management. For buildings with heat pump water heating, meet the requirements for installation of controls specified by Title 24, Part 6, Reference Appendix JA13.3.3.

A4.203.1.2.7 Battery storage system controls. For buildings with battery storage systems, meet the requirements for installation of controls specified by Title 24, Part 6, Reference Appendix JA12 for either the Time-of-Use Control or Advanced Demand Flexibility Control option.

~~**A4.203.1.2.8 Heat pump space and water heating.** Meet the space heating and water heating loads using heat pump equipment~~.

A4.203.1.3 Consultation with local electric service provider. Local jurisdictions considering adoption of reduced EDR targets based on using solar photovoltaic (PV) systems larger than required by the *California Energy Code* shall consult with the local electric service provider to ensure that PV system sizing required to comply with the EDR targets will be acceptable to the local electric service provider. The local jurisdiction shall not require onsite PV systems that are larger than the local electric service provider will allow to be interconnected.

A4.203.1.4 Outdoor Luminaires. Outdoor luminaires installed for new multifamily buildings, hotels, and ~~h~~motels shall meet the following requirements ~~are as follows~~.

~~**A4.203.1.4.1** Outdoor building-mounted luminaires intended solely to illuminate any surface including walls and signs shall be mounted above the surface and face downward to prevent uplight or shall be shielded for the direct light emitted from the luminaire to be confined to the surface. Security luminaires shall be mounted and oriented to avoid glare onto adjacent rights-of-way or property.~~

A4.203.1.4.~~2~~1 Outdoor pole-mounted and arm-mounted luminaires ~~should~~ shall be installed with tilting not greater than 10 degrees, or the outdoor luminaires shall be installed with arm-mount or tenon-mount capable of tilting less than or within 10 degrees.

Exception to Section A4.203.1.4:

1. ~~Luminaires that qualify as exception in Sections 160.5(e)1 of Title 24, Part 6.~~ Lighting for one- and two-family dwellings and townhouses with attached private garages.
2. Lighting for building facades, public monuments, public art, statues and vertical surfaces of bridges.
3. Lighting not permitted by a health or life safety statute, ordinance or regulation to be a cutoff luminaire.
4. Temporary outdoor lighting.
5. Lighting required and regulated by the Federal Aviation Administration, or the Coast Guard.
6. Lighting for public streets, roadways, highways, and traffic signage lighting, including lighting for driveway entrances occurring in the public right-of-way. Luminaires that illuminate the public right of way including publicly maintained or utility-maintained sidewalks and bikeways.
7. Lighting for sports and athletic fields, and children's playgrounds.
8. Lighting for industrial sites, including but not limited to, rail yards, maritime shipyards and docks, piers and marinas, chemical and petroleum processing plants, and aviation facilities.
9. Lighting of tunnels, bridges, stairs, wheelchair elevator lifts for American with Disabilities Act (ADA) compliance, and ramps that are not parking garage ramps.
10. In theme parks: outdoor lighting only for themes and special effects.
11. Lighting for outdoor theatrical and other outdoor live performances, provided that these lighting systems are additions to area lighting systems and are controlled by a multi- scene or theatrical cross-fade control station accessible only to authorized operators.
12. Outdoor lighting systems for qualified historic buildings, as defined in the California Historic Building Code (Title 24, Part 8), if they consist solely of historic lighting components or replicas of historic lighting components. If lighting systems for qualified historic buildings contain some historic lighting components or replicas of historic components, combined with other lighting components, only those historic or historic replica components are exempt. All other outdoor lighting systems for qualified historic buildings shall not be exempted.

SECTION A4.204

REQUIREMENTS FOR

ALTERATIONS TO EXISTING BUILDINGS

A4.204.1 Energy Efficiency. Alterations to existing residential buildings shall comply with Sections A4.204.1.1 and A4.204.1.2.

A4.204.1.1 Altered Space-Conditioning System Serving Existing Single-Family Dwelling Units – Mechanical Cooling. When a space-conditioning system serving an existing single-family dwelling unit is altered in climate zones 1 through 14 and 16 by installation or replacement of an air conditioner, the altered system shall comply with either a or b below in addition to the requirements for installation specified by Title 24, Part 6, Sections 150.2(b)1E and 150.2(b)1F:

a. A heat pump ~~as~~ shall be the primary heating source and sized according to the system selection requirements specified by Title 24, Part 6 of Section 150.0(h)5. Supplemental heating may be provided by an existing gas furnace or existing electric resistance heating; or

b. An air conditioner ~~that~~ shall meet~~s~~ the following requirements:

I. R-8 duct insulation for ducts located in unconditioned space; and

II. The duct system measured air leakage shall be equal to or less than 5 percent of the system air handler airflow as confirmed through field verification and diagnostic testing, per the requirements in Title 24, Part 6, Reference Residential Appendix Section RA3.1.4.3.1; and

III. Demonstrate, in every control mode, airflow greater than or equal to 400 CFM per ton of nominal cooling capacity through the return grilles, and an air-handling unit fan efficacy less than or equal to 0.35 W/CFM. The airflow rate and fan efficacy requirements in this section shall be confirmed through field verification and diagnostic testing, following the procedures outlined in Title 24, Part 6, Reference Residential Appendix RA3.3; and

IV. In all climate zones refrigerant charge verification requirements shall meet the requirements in Title 24, Part 6 Section 150.2(b)1Fiib; and

V. Vented attics shall have insulation installed to achieve a U-factor of 0.020 or insulation installed at the ceiling level shall result in an insulated thermal resistance of R-49 or greater for the insulation alone; and

VI. Air seal all accessible areas of the ceiling plane between the attic and the conditioned space in accordance with the requirements in Title 24, Part 6 Section 150.2(b)1Jii.

Exception 1 to Section A4.204.1.1: Where the capacity of the existing main electrical service panel is insufficient to ~~service~~ supply the ~~additional~~ electrical capacity of a heat pump ~~relative to~~ and where the existing main electrical service panel is sufficient to supply a new or replacement air conditioner, as calculated according to the requirements of California Electrical Code Article 220.83 or 220.87. Documentation of electrical load calculations in accordance with Article 220 must be submitted to the enforcement agency prior to permitting for both the heat pump and proposed air conditioner.

Exception 2 to Section A4.204.1.1: Where the required capacity of a heat pump to meet the system selection requirements of Section 150.0(h)5 is greater than or equal to 12,000 Btu/h more than the required capacity of an air conditioner to meet the design cooling load. Documentation of heating and cooling load calculations in accordance with 150.0(h) must be submitted to the enforcement agency prior to permitting for both the heat pump and proposed air conditioner.

A4.204.1.2 Altered Pool and/or Spa Heating for Existing Multifamily Buildings. Alteration of existing multifamily pool and/or spa heating system shall meet the following.

Heating Source Sizing. Heating systems, or equipment for pool or spa, shall meet the sizing requirements of 1, 2, or 3 below:

1. A solar pool heating system with a solar collector surface area that is equivalent to 65 percent or greater of the surface areas of the pool or spa or a combination of both respectively; or

2. A heat pump pool heater as the primary heating system that meets the sizing requirements of Reference Joint Appendix JA16.3. The control for the heat pump pool heater shall meet the requirements specified in Title 24, Part 6, ~~s~~Section 110.2(~~b~~d). The ~~backup~~ supplementary heater can be of any energy source; or

3. A heating system that derives at least 60 percent of the annual heating energy from on-site renewable energy or on-site recovered energy.

4. A combination of a solar pool heating system and heat pump pool heater without any additional supplementary heater; or

5. A pool heating system determined by the Energy Commission Executive Director to use no more energy than the systems specified in Items 1, 2, 3, or 4 above.

Exception 1 to A4.204.1.2: Portable electric spas compliant with the Appliance Efficiency Regulations.

Exception 2 to A4.204.1.2: A pool or spa that is heated solely by a solar pool heating system without any ~~backup~~ supplementary heater.

Exception 3 to A4.204.1.2: An existing building with inadequate Solar Access Roof Area (SARA) as specified in Title 24, Part 6, Section 170.2(f) for a solar pool heating system to be installed.

Exception 4 to A4.204.1.2: Heating systems which are used exclusively for permanent spa applications in existing buildings with gas availability.

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.

CALIFORNIA GREEN BUILDING STANDARDS CODE – MATRIX ADOPTION TABLE
APPENDIX A5 – NONRESIDENTIAL VOLUNTARY MEASURES
DIVISION A5.2 – ENERGY EFFICIENCY

(Matrix Adoption Tables are nonregulatory, intended only as an aid to the code user.
See Chapter 1 for state agency authority and building applications.)

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 findings of the California Energy Commission in compliance with Title 24, Part 1, Section 10-106, prior to enforcement. Once the required filing has been verified and finding has been made 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 (Title 24, Part 1, Section 10-106 is available at http://www.energy.ca.gov/title24/2025standards/).

SECTION A5.202
DEFINITIONS

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

ENERGY BUDGET.

GEOTHERMAL.

LONG-TERM SYSTEM COST (LSC).

ON-SITE RECOVERED ENERGY.

PROCESS.

SOLAR ACCESS.

~~**TIME DEPENDENT VALUATION (TDV).**~~

SOLAR POOL HEATING SYSTEM.

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 A5.203.1.2. 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 Section A5.203.1.2.

A5.203.1.1 Tier 1 and Tier 2 prerequisites. 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. Outdoor lighting requirements are described below.

A5.203.1.1.1.1 Newly installed outdoor lighting power shall be no greater than 90 percent of the Allowed Outdoor Lighting Power, and general hardscape lighting within the scope of Title 24, Part 6, Section 140.7(b)1 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~~for Outdoor Lighting.

~~**A5.203.1.1.1.2** Outdoor building-mounted luminaires intended solely to illuminate any surface including walls and signs shall be mounted above the surface and face downward to prevent uplight or shall be shielded for the direct light emitted from the luminaire to be confined to the surface. Security luminaires shall be mounted and oriented to avoid glare onto adjacent rights-of-way or property.~~

A5.203.1.1.1.~~3~~2 Outdoor pole-mounted and arm-mounted luminaires ~~should~~ shall be installed with tilting not greater than 10 degrees, or the outdoor luminaires shall be installed with arm-mount or tenon-mount capable of tilting less than or within 10 degrees.

Exceptions to Section A5.203.1.1.1:

1. The color temperature requirement is not applicable to the applications identified in the exceptions to Section 140.7(a) of Title 24, Part 6, nor to the applications identified as "specific applications" in Section 140.7(b)2 and Table 140.7-B of Title 24, Part 6.

Exceptions to Section A5.203.1.1.2:

1. ~~Luminaires that qualify as exception in Sections 130.2(b) of Title 24, Part 6~~ Lighting for building facades, public monuments, public art, statues and vertical surfaces of bridges.
2. Lighting not permitted by a health or life safety statute, ordinance or regulation to be a cutoff luminaire.
3. Temporary outdoor lighting.
4. Lighting required and regulated by the Federal Aviation Administration, or the Coast Guard.
5. Lighting for public streets, roadways, highways, and traffic signage lighting, including lighting for driveway entrances occurring in the public right-of-way. Luminaires that illuminate the public right of way including publicly-maintained or utility-maintained sidewalks and bikeways.
6. Lighting for sports and athletic fields, and children's playgrounds.
7. Lighting for industrial sites, including but not limited to, rail yards, maritime shipyards and docks, piers and marinas, chemical and petroleum processing plants, and aviation facilities.
8. Lighting of tunnels, bridges, stairs, wheelchair elevator lifts for American with Disabilities Act (ADA) compliance, and ramps that are not parking garage ramps.
9. In theme parks: outdoor lighting only for themes and special effects.
10. Lighting for outdoor theatrical and other outdoor live performances, provided that these lighting systems are additions to area lighting systems and are controlled by a multi- scene or theatrical cross-fade control station accessible only to authorized operators.
11. Outdoor lighting systems for qualified historic buildings, as defined in the California Historic Building Code (Title 24, Part 8), if they consist solely of historic lighting components or replicas of historic lighting components. If lighting systems for qualified historic buildings contain some historic lighting components or replicas of historic components, combined with other lighting components, only those historic or historic replica components are exempt. All other outdoor lighting systems for qualified historic buildings shall not be exempted.

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 at the time of permitting. This requirement shall apply to newly constructed buildings and to loading dock doors added to existing buildings.

A5.203.1.1.4 Daylight Design Power Adjustments Factors (PAFs). Daylighting devices shall be installed as specified in Title 24, Part 6, Section 140.3(d).

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 percent 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 Title 24, Part 6, Section 140.4(e), Economizers.

Exceptions:

1. Systems serving spaces that are not cooled and that are heated to less than 60°F.
2. Where more than 60 percent of the outdoor air heating energy is provided from site-recovered energy.
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:
    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.
4. Systems expected to operate less than 20 hours per week.

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 building type and 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 nonresidential 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 nonresidential 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.
3. For high-rise residential and hotel/motel building projects: 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.

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 building type and 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 nonresidential 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 nonresidential 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.
3. For high-rise residential and hotel/motel building projects: 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.

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

SECTION A5.204
REQUIREMENTS FOR
ALTERATIONS TO EXISTING BUILDINGS

A5.204.1 Energy Efficiency. Alterations to existing nonresidential buildings shall comply with Section A5.204.1.1.

A5.204.1.1 Altered Pool and/or Spa Heating for Existing Nonresidential Buildings. Alteration of existing nonresidential pool and/or spa heating system shall meet the following.

Heating Source Sizing. Heating systems, or equipment for pool or spa, shall meet the sizing requirements of 1, 2, or 3 below:

1. Solar pool heating system with a solar collector surface area that is equivalent to 65 percent or greater of the surface areas of the pool or spa or a combination of both respectively; or
2. A heat pump pool heater as the primary heating system that meets the sizing requirements of Reference Joint Appendix JA16.3. The control for the heat pump pool heater shall meet the requirements specified in ~~s~~Section 110.2(~~b~~d). The ~~backup~~ supplementary heater can be of any energy source; or
3. A heating system that derives at least 60 percent of the annual heating energy from on-site renewable energy or on-site recovered energy.
4. A combination of a solar pool heating system and heat pump pool heater without any additional supplementary heater; or
5. A pool heating system determined by the Energy Commission Executive Director to use no more energy than the systems specified in Items 1, 2, 3, or 4 above.

Exception 1 to A5.204.1.1: Portable electric spas compliant with the Appliance Efficiency Regulations.

Exception 2 to A5.204.1.1: A pool or spa that is heated solely by a solar pool heating system without any supplementary~~backup~~ heater.

Exception 3 to A5.204.1.1: An existing building with inadequate Solar Access Roof Area (SARA) as specified in Section 140.10(a) for a solar pool heating system to be installed.

Exception 4 to A5.204.1.1: Heating systems which are used exclusively for permanent spa applications in existing buildings with gas availability.

SECTION A5.211
~~RENEWABLE ENERGY~~RESERVED

~~**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 *California Electrical Code.* Natural gas or propane use is calculated in accordance with the *California Plumbing Code*.~~

~~**A5.211.1.1 Documentation.** Using a calculation method approved by the California Energy Commission, calculate the renewable 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 Variable Voltage Variable Frequency (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.