DOCKETED	
Docket Number:	24-BSTD-02
Project Title:	2025 CALGreen Rulemaking
TN #:	256699
Document Title:	June 5, 2024, Presentation Slides from Lead Commissioner Hearing on 2025 CALGreen
Description:	Presentation slides from the June 5, 2024, Lead Commissioner Hearing on the proposed changes to the 2025 Green Building Standards Code, Title 24, Part 11 (CALGreen), Appendices A4.2 and A5.2. All materials related this this hearing, including a recording of the hearing will be posted on the event website at https://www.energy.ca.gov/event/meeting/2024-06/lead-commissioner-hearing.
Filer:	Michael Shewmaker
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	6/5/2024 11:33:53 AM
Docketed Date:	6/5/2024

2025 CALGreen - Lead Commissioner Hearing

Authority, Metrics, and Timeline

Michael Shewmaker, Supervisor, Building Standards Development Unit

June 5, 2024

Authority & Process

California's Warren-Alquist Act signed into law in 1974

- Reduction of wasteful, uneconomic, inefficient, or unnecessary consumption of energy as it relates to buildings.

- To comply with this requirement, the CEC has authority to update and maintain the state's mandatory Building Energy Efficiency Standards, Title 24, Part 6 (otherwise known as the Energy Code).

- This language also provides us with the authority to update the voluntary building energy efficiency requirements within CALGreen, Title 24, Part 11.

CEC's Authority within CALGreen

Within CALGreen (Title 24, Part 11), the CEC is considered an adopting agency, as opposed to a proposing agency – meaning we (the CEC) have the ability to adopt our own regulations.

However, this authority is limited to two specific sections:

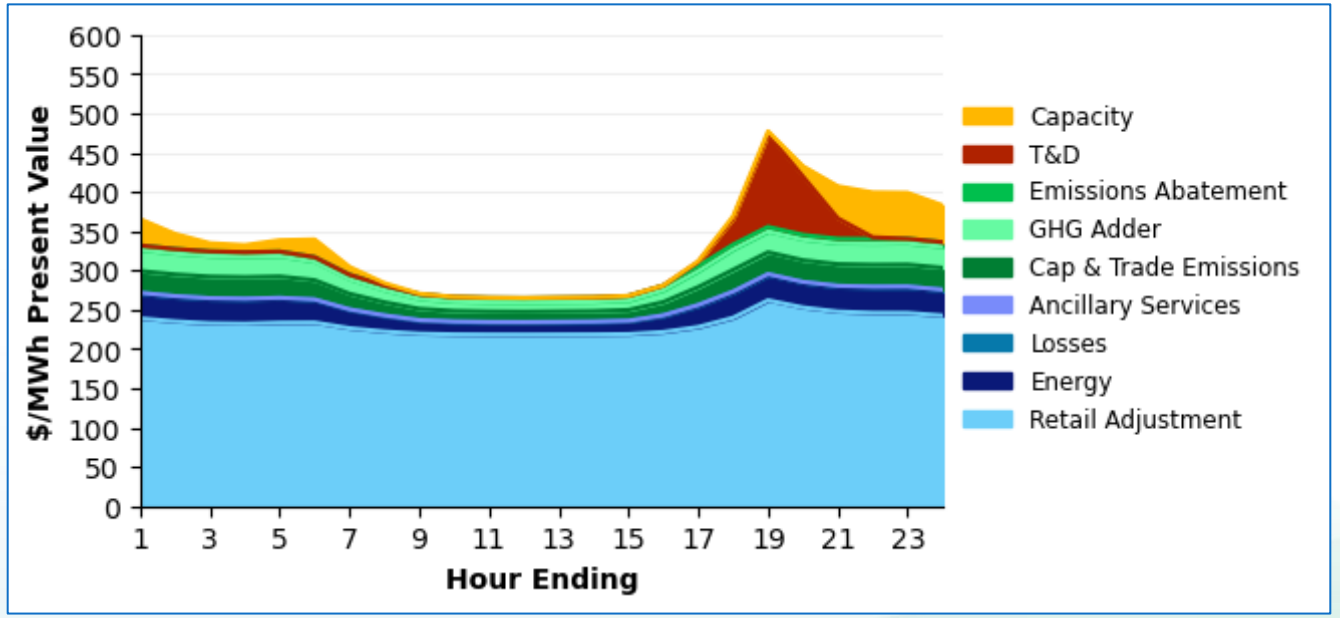
- Appendix A4.2 – Residential Voluntary Measures, Energy Efficiency
- Appendix A5.2 – Nonresidential Voluntary Measures, Energy Efficiency

These adopted regulations are then approved by the Building Standards Commission (BSC) for inclusion in Part 11.

Long-Term System Cost

Long-term System Cost (LSC) Hourly factors are used to convert predicted site energy use to long-term dollar costs to CA's energy system.

Since the *time* that energy is used is as important as the *amount* of energy used, these factors are generated on an hourly basis for a representative year and created for each of CA's diverse climate zones.



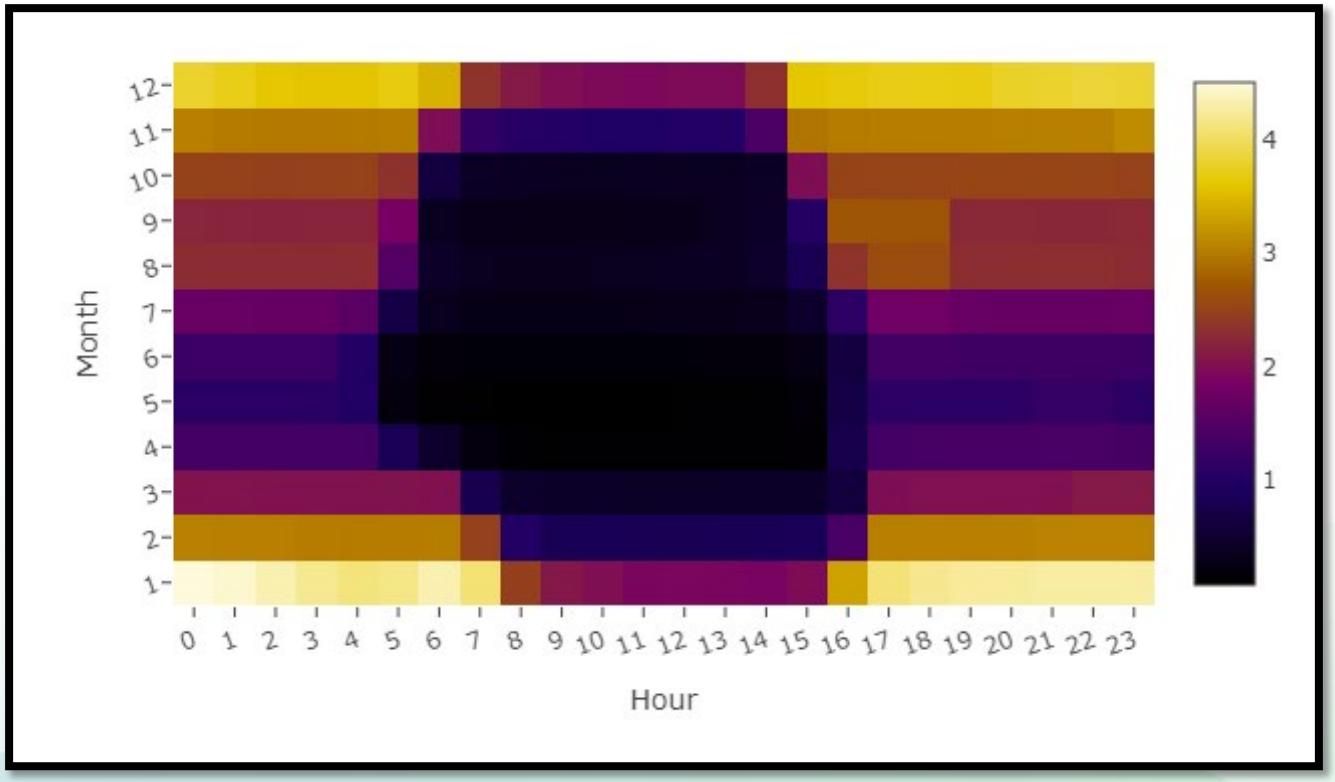
Sample LSC shape by component, average day, levelized 30-year residential, climate zone 12

Source Energy Metric

Long run marginal source energy is defined as the source energy of fossil fuels following the long-term effects of any associated changes in resource procurement.

Source Energy focuses specifically on the amount of fossil fuels that are combusted in association with demand-side energy consumption and assists in aligning our standards with the CA's environmental goals.

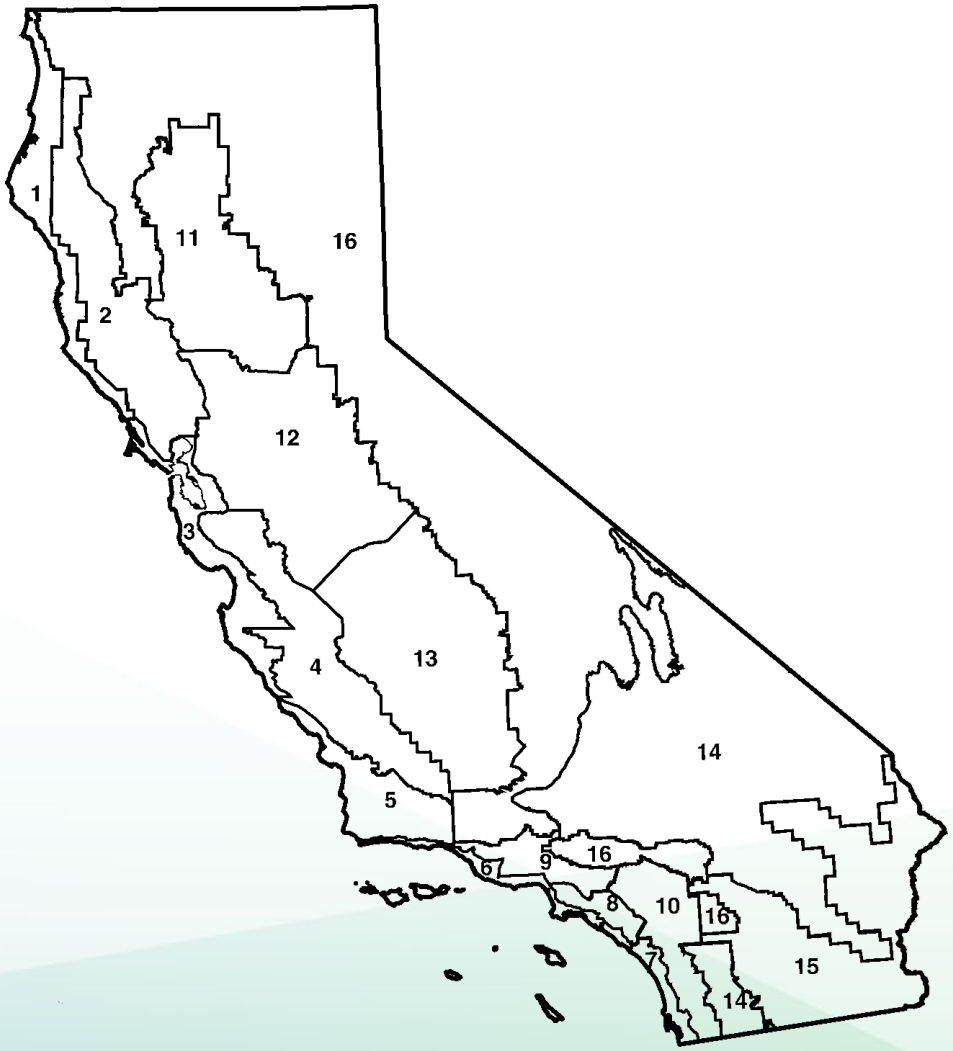
5-Month Average of electricity long run marginal source energy for 2025 Energy Code



California Climate Zones

California has 16 climate zones

- Climate Zones allow software to more accurately simulate variances weather, and as a result, energy consumption of buildings
- A measure's cost effectiveness can vary as a result of weather differences
- Energy Code requirements vary by climate zone as a result



2025 Cycle - Work To Date

Milestones	Timelines
Codes & Standards Enhancement (CASE) Team Measure Proposal Efforts • 19 Public Workshops • https://title24stakeholders.com/	June 2021 – July 2023
CEC Updated Weather Data, LSC, and Source Energy Metrics • 2 Public Workshops	March 2022 – September 2022
CEC Pre-Rulemaking Workshops • 9 Public Workshops • https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=22-BSTD-01	March 2023 – September 2023
CEC Presented at the Green Code Advisory Committee (CAC) Meeting	March 18, 2024
CEC released 45-day Rulemaking Language	May 17, 2024

2025 Energy Code Work To Come

Milestones	Timelines
Rulemaking 45-Day Public Comment Period	May 17, 2024 – July 1, 2024
Lead Commissioner Hearing	June 5, 2024
Rulemaking 15-Day Comment Period	July – August 2024
CEC Adoption of 2025 CALGreen	September 11, 2024
Package to CBSC	October 11, 2024
CBSC Approval of all Title 24 Updates	December 2024
2025 CALGreen Effective Date	January 1, 2026

2025 CALGreen (Title 24, Part 11)

CEC's Proposed Measures for 2025 CALGreen (Title 24, Part 11), Appendices A4.2 & A5.2

Michael Shewmaker, Supervisor, Building Standards Development Unit

June 5, 2024

These changes are being made by BSC & HCD.

Definitions
Chapter 2

Old Definitions to be Removed

- 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)

New Definitions to be Added/Modified

- **Long-Term System Cost (LSC)** is the CEC projected present value of costs over a 30-year period for California's energy system. LSC does not represent a prediction of individual utility bills.
- **Energy Budget** is 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 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 just Long-Term System Cost (LSC).

New Definitions to be Added/Modified

- **Recovered Energy** is energy used in a building that (1) is recovered from space conditionings, 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** is recovered energy that is captured at the building site.

- **Solar Pool Heating System** is 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.

Residential Voluntary Measures

Appendix A4.2 – Energy Efficiency

What is being proposed for 2025?

Residential Voluntary Measures – Appendix A4.2:

- A4.202.1 – Update definitions
  - Energy Design Rating (EDR1) → Long-term System Cost (LSC)
- A4.203.1.1 – Update performance compliance margins
- A4.203.1.4 – Add outdoor lighting standards
- A4.204 – Add a new section for alterations to existing buildings
- A4.204.1.1 – Add new standards for altered space conditioning systems – mechanical cooling
- A4.204.1.2 – Add new standards for altered pool and/or spa heating
  - This requirement only applies to multifamily.

Proposed LSC Compliance Margins

A4.203.1

LSC Compliance Margin Proposal

A4.203.1 Energy Efficiency – Update energy accounting methodology:

- Energy Design Rating (EDR1) to Long-term System Cost (LSC)

Table A4.203.1.1: Recommended LSC Margins By Climate Zones – Update performance compliance margins table

- Revise performance compliance margins based on the proposed 2025 two heat pump baseline in Title 24, Part 6, plus:
  - Verified low-leakage ducts in conditioned space (VLLDCS) and/or
  - Compact hot water distribution (CDHW).

Source: 2025 Energy Code Accounting Report, available here: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=24-BSTD-01

Proposed Measure Description

- Verified Low-Leakage Ducts in Conditioned Space:
  - A visual inspection shall confirm the duct system location as specified by the Reference Appendices, RA3.1.4.1.3
  - Ducts shall be confirmed to have less than or equal to 25 cfm leakage to outside when measured as specified by Reference Appendices, RA3.1.4.3.4

- Compact Hot Water Distribution:
  - As specified in Reference Appendices, RA4.4.6

Proposed Measure Description

- In climate zones 1-5, 11, 12, and 14-16, the LSC compliance margin is based on the proposed two heat pump baseline from Title 24, Part 6 (Energy Code), plus verified low-leakage ducts in conditioned space and compact hot water distribution.
  - Note: Climate Zone 15 is not cost-effective based on CEC methodology but has been included because local jurisdictions can consider additional savings beyond LSC savings in their cost-effective analysis.

- In climate zones 6-10 & 13, the LSC compliance margin is based on the proposed two heat pump baseline, plus compact hot water distribution.

Proposed LSC Compliance Margins

Climate Zone	LSC Compliance Margin
1	2.70
2	1.62
3	1.10
4	1.11
5	1.01
6	**0.24**
7	**0.24**
8	**0.21**
9	**0.20**
10	**0.18**
11	1.11
12	1.05
13	**0.23**
14	1.21
15	0.59
16	1.68

Compliance Packages:

Both compliance packages are based on a heat pump space heater and heat pump water heater, along with the following additional measures:

- CZs 1-5, 11, 12, 14-16:
  - Verified Low-Leakage Ducts in Conditioned Space (VLLDCS)
  - Compact Hot Water Distribution (CDHW)
- CZs 6-10 & 13 – **shown in bold**:
  - Compact Hot Water Distribution (CDHW)

Outdoor Lighting Standards

A4.203.1.4

Outdoor Lighting Standards

A4.203.1.4

Requirements for luminaires (light fixtures) lighting on freestanding surface:

- Be mounted above the surface and face downward; or
- Be shielded and direct the light to the intended surface.

Requirements for pole-mounted luminaires and arm-mounted luminaires:

- Installed not tilted greater than 10 degrees; or
- Installed with mounting hardware capable of tilting no greater than 10 degrees.

Exception:

- For luminaires that qualify as exempted under the Energy Code Section 160.5(c)1.

Alterations to Pool or Spa Heating

A4.204.1.2

Alterations to Pool or Spa Heating

A4.204.1.2

New voluntary measure with several options for compliance applicable to Multifamily pool or spa heating system alterations:

- A solar thermal pool heating system with collector surface area equal to 65% of pool surface area for multifamily; or
- A primary heat pump pool heater meeting sizing requirement in new JA16 and minimum efficiency requirement; or
- On-site renewable energy or site recovered energy providing at least 60% of the annual heating energy.

❖**To be added to 15-Day Express Terms**

- A combination of solar pool heating and heat pump pool heater without additional supplementary heater
- Equivalent system as determined by CEC Executive Director

Alterations to Pool or Spa Heating

A4.204.1.2

Exceptions to Pool or Spa Heating System alteration measure:

- Portable electric spas compliant with the Appliance Efficiency Regulations (Title 20).
- A pool or spa that is heated solely by a solar pool heating system.

❖ **New exception under consideration for 15-Day Express Terms**

- Inadequate solar access roof area

Alterations to Space Conditioning Systems – Mechanical Cooling

A4.204.1.1

Alterations to Air Conditioning Systems

A4.204.1.1(a)

Prescriptively require a heat pump (HP) when replacing an air-conditioner (A/C) in existing single-family homes.

- Supplemental heating can be provided by a new or existing gas furnace.
- Standard air-conditioners can continue to be installed if paired with additional energy efficiency measures.
- Exceptions apply if:
  1) Electrical panel upgrade is required.
  2) The required HP sizing increases existing equipment size by one ton or more.

❖ **To be added to 15-Day Express Terms**

  3) Air-conditioner alterations in climate zone 15.

Prescriptive Compliance Option

A204.1.1(b)

Air conditioner (14.3 SEER2/11.7EER2) with new or existing furnace

- Airflow greater than or equal to 400 CFM per ton of nominal cooling capacity; and
- Air-handling unit fan efficacy less than or equal to 0.35 W/CFM; and
- R-8 insulation on ducts located in unconditioned space; and
- Duct system measured leakage shall be equal to or less than 5%; and
- Meet the refrigerant charge verification requirements of Title 24 Part 6 Section 150.2(b)1Fiib in all climate zones; and
- Vented attics; and
  - Insulation installed to achieve a weighted U-factor of 0.020; or
  - R-49 or greater insulation at the ceiling level
- Air seal all accessible areas.

Single Family A/C to HP Replacement Cost

- Efficiency measures commonly have short-term costs while resulting in long-term system cost savings.

California Climate Zone (% of State)	First Cost
1-North Coast (0.5%)	$3,322
2-North Coast Valley (3%)	$1,263
3-San Francisco Bay (11%)	$759
4-Central Valley Coast (6%)	$1,263
5-Central Coast (1%)	$1,008
6-Los Angeles Coast (7%)	$1,008
7-San Diego Coast (5%)	$1,008
8-Orange County Coast (10%)	$1,519
9-Los Angeles (14%)	$1,519
10-South Inland (12%)	$1,519
11-North Central Valley (4%)	$1,848
12-Sacramento (15%)	$1,519
13-Central Valley (7%)	$1,848
14-High Desert (3%)	$1,519
15-Low Desert (2%)	$2,178
16-Mountains (1%)	$2,385
Weighted Averages	**$1,415**

Source : CEC's 2025 Single-Family Heat Pump Replacements Report

Voluntary Measure Benefits

Why Part 11?

- Since proposal incurs costs on residents rather than builders/developers, a measured and gradual market adjustment is needed to reduce the risk of public dissatisfaction.
- Allows time to develop partnerships with heat pump manufacturers and roll out incentive programs with a focus on benefiting low-income communities.
- Aligns with influx of public subsidies coming to support HP installations.
- Provides time for installers to gain more familiarity with heat pump solutions for existing buildings.
- Offers a framework for local governments to adopt where appropriate.
- This measure is a critical step for the decarbonization of existing buildings.

Overall Measure Benefits:

- Transition to heat pumps helps achieve California's energy and GHG objectives by increasing energy efficiency of space conditioning systems in existing buildings and enhancing building decarbonization efforts.
- Reduces the wasteful, uneconomic, inefficient, or unnecessary consumption of energy as directed by California Public Resources Code Sections 25402.

Comments and/or Questions

How/Where to Submit Comments

- Please submit your comments and questions to the docket (24-BSTD-02) **by 5:00pm on Monday, July 1, 2024.**

- Comments can be submitted directly here: https://efiling.energy.ca.gov/Ecomment/Ecomment.aspx?docketnumber=24-BSTD-02

OR

- Comments can also be emailed to the Docket Unit at: docket@energy.ca.gov
  - Please include docket number: 24-BSTD-02, and “2025 CALGreen” in the subject line.

Public Advisor's Assistance

- The CEC's Office of the Public Advisor, Energy Equity, and Tribal Affairs assists the public with participation in CEC proceedings.
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  - Please reach out as soon as possible, at least five (5) days in advance.
- The CEC will work diligently to meet all requests based on availability.

2025 Webpage & Docket

2025 Green Building Standards Code (CALGreen) webpage:

- https://www.energy.ca.gov/proceeding/2025-california-green-building-standards-code-calgreen
  - Links to CALGreen Rulemaking Docket (24-BSTD-02) and documents
  - Link to event page, including today's recording (when available)

2025 CALGreen Rulemaking Docket (24-BSTD-02):

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  - Rulemaking documents (NOPA, Form 399)
  - Proposed regulatory language (Express Terms, ISOR)
  - Documents relied upon

Thank You!

15-minute Break

We will resume at 10:15

Nonresidential Voluntary Measures

Appendix A5.2 – Energy Efficiency

What is being proposed for 2025?

Nonresidential Voluntary Measures – Appendix A5.2:

- A5.203.1.1.1 – Revise outdoor lighting standards
- A5.204 – Add new section for alterations to existing buildings
- A5.204.1.1 – Add standards for alterations to pool and/or spa heating
- A5.211 – Remove ‘Renewable Energy Section’
- A5.213 – Rename section ‘Energy Efficient Framing’

Outdoor Lighting Standards

A5.203.1.1.1

Outdoor Lighting Standards

A5.203.1.1.1

Requirements for luminaires (light fixtures) lighting on freestanding surface

- Be mounted above the surface and face downward; or
- Be shielded and direct the light to the intended surface.

Requirements for pole-mounted luminaires and arm-mounted luminaires:

- Installed not tilted not greater than 10 degrees; or
- Installed with mounting hardware capable of tilting no greater than 10 degrees.

Exception:

- For luminaires that qualify as exempted under the Energy Code Section 130.2(b).

Alterations to Pool or Spa Heating

A5.204.1.1

Alterations to Pool or Spa Heating

A5.204.1.1

- New voluntary measure with several options for compliance applicable to Nonresidential pool or spa heating system alterations:
  - A solar thermal pool heating system with collector surface area equal to 65% of pool surface area for nonresidential; or
  - A primary heat pump pool heater meeting sizing requirement in new JA16 and minimum efficiency requirement; or
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❖**To be added to 15-Day Express Terms**

- A combination of solar pool heating and heat pump pool heater without additional supplementary heater
- Equivalent system as determined by CEC Executive Director

Alterations to Pool or Spa Heating

A5.204.1.1

- Exceptions to Pool or Spa Heating System alteration measure:
  - Portable electric spas compliant with the Appliance Efficiency Regulations.
  - A pool or spa that is heated solely by a solar pool heating system.

❖ **New exception under consideration for 15-Day Express Terms**

  - Inadequate solar access roof area

Other Sections

A5.211

- Remove “Renewable Energy” section and mark as RESERVED.

SECTION A5.211
~~RENEWABLE ENERGY~~RESERVED

A5.213

- Rename section “Energy Efficient Framing” to remove limitation to steel framing.

SECTION A5.213
ENERGY EFFICIENT ~~STEEL~~ FRAMING

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Contact Information

Michael Shewmaker, Supervisor
- Part 11 project lead
- Michael.Shewmaker@energy.ca.gov

Danny Tam, Assoc. Mechanical Engineer
- Solar pool & spa heating
- Danny.Tam@energy.ca.gov

Payam Bozorgchami, P.E., Sr. Civil Engineer
- Part 6/Part 11 technical lead
- Payam.Bozorgchami@energy.ca.gov

Simon Lee, P.E., Electrical Engineer
- Outdoor lighting requirements
- Simon.Lee@energy.ca.gov

Bach Tsan, P.E., Senior Mechanical Engineer
- Space conditioning system alterations
- Bach.Tsan@energy.ca.gov

Stephen Becker, Mechanical Engineer
- LSC compliance margins
- Stephen.Becker@energy.ca.gov

Thank You!