DOCKETED	
Docket Number:	24-BSTD-01
Project Title:	2025 Energy Code Rulemaking
TN #:	255807
Document Title:	April 17, 2024, Presentation Slides from Lead Commissioner Hearing on 2025 Building Energy Efficiency Standards
Description:	Presentation slides from the April 17, 2024, Lead Commissioner Hearing on the proposed changes to the 2025 Building Energy Efficiency Standards. All materials related to this hearing, including a recording of this hearing will be posted on the event website at https://www.energy.ca.gov/event/2024-04/day-2-lead-commissioner-hearings-2025-building-energy-efficiency-standards.
Filer:	Javier Perez
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	4/19/2024 1:06:53 PM
Docketed Date:	4/19/2024

Good morning and thank you for joining us.

The hearing will begin shortly.

2025 Building Energy Efficiency Standards – Lead Commissioner Hearing

April 17, 2024

Housekeeping Rules

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Todays Agenda

	Topics	Presenter
	General Structure of Workshop	Payam Bozorgchami
	Opening Remarks	Commissioner McAllister
	Rulemaking Introduction	Javier Perez
	Covered Processes: • Controlled Environment Horticulture • Commercial Kitchens • Refrigeration • Laboratories	Haile Bucaneg
	Break	
	Nonresidential Building, Mechanical Mandatory Measures	Ronald Balneg
	Nonresidential Building, Lighting provisions	Simon Lee
	Lunch	

Todays Agenda (continued)

	Topics	Presenter
	Nonresidential Buildings: • Envelope • Mechanical Measures	Bach Tsan
	Break	
	Nonresidential Buildings: • Photovoltaic • Battery Energy Storage Systems	Muhammad Saeed
	Closing Remarks	Commissioner McAllister
	End	Payam Bozorgchami

Thank you for participating in today's hearing!

Comments on Lead Commissioner Hearings

- **Due Date: May 13, 2024, by 5:00 PM**
- **Comments to be submitted to: https://efiling.energy.ca.gov/Ecomment/Ecomment.aspx?docketnumber=24-BSTD-01**
- **Public Assistance with Participation**

  Public Advisor - Mona Badie
  publicadvisor@energy.ca.gov

  916-957-7910

  https://www.energy.ca.gov/about/divisions-and-offices/office-public-advisor

Upcoming Lead Commissioner Hearing

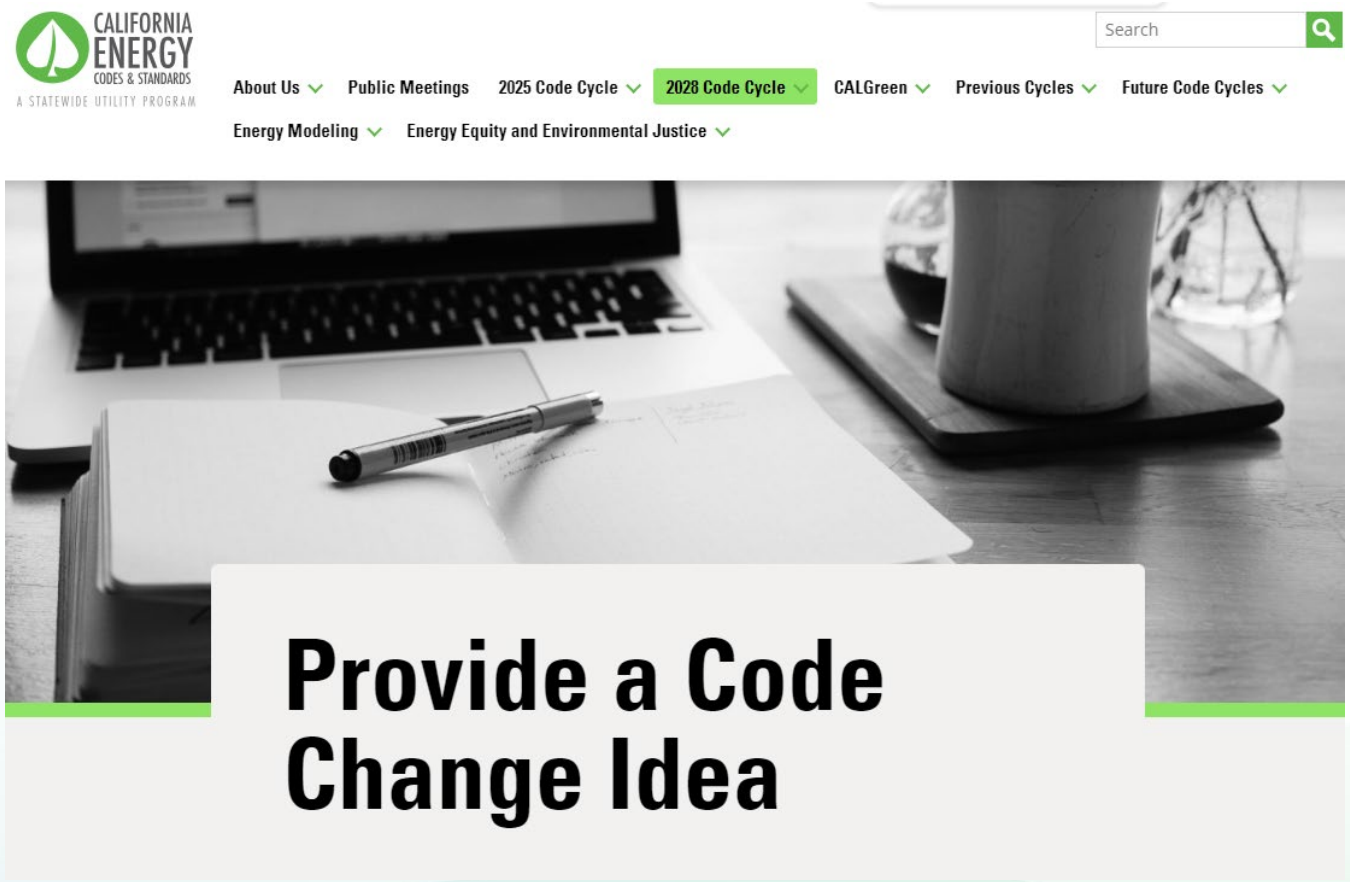
Upcoming 2025 Energy Code Lead Commissioner Hearing

- Thursday, April 18, from 9am to 3pm
- Topics covered will include:
  - Sigle-Family Residential Buildings
    - Mandatory Measures
    - Prescriptive Measures
    - Additions and Alteration
  - Multifamily Buildings
    - Mandatory Measures
    - Prescriptive Measures
    - Additions and Alteration

2028 Measure Proposal Ideas

CASE Team 2028 Measure Intake Webpage Now Available

- Measures not included in 2025 cycle
- New ideas, technologies, etc.
- Intake portal now open
- Visit: https://title24stakeholders.com/provide-a-code-change-idea/



Comments on the 2025 Codes

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- Thank you for participating!

2025 Building Energy Efficiency Standards Rulemaking - Lead Commissioner Hearings

Energy Code Authority, Drivers and Themes, Metrics, and Timeline

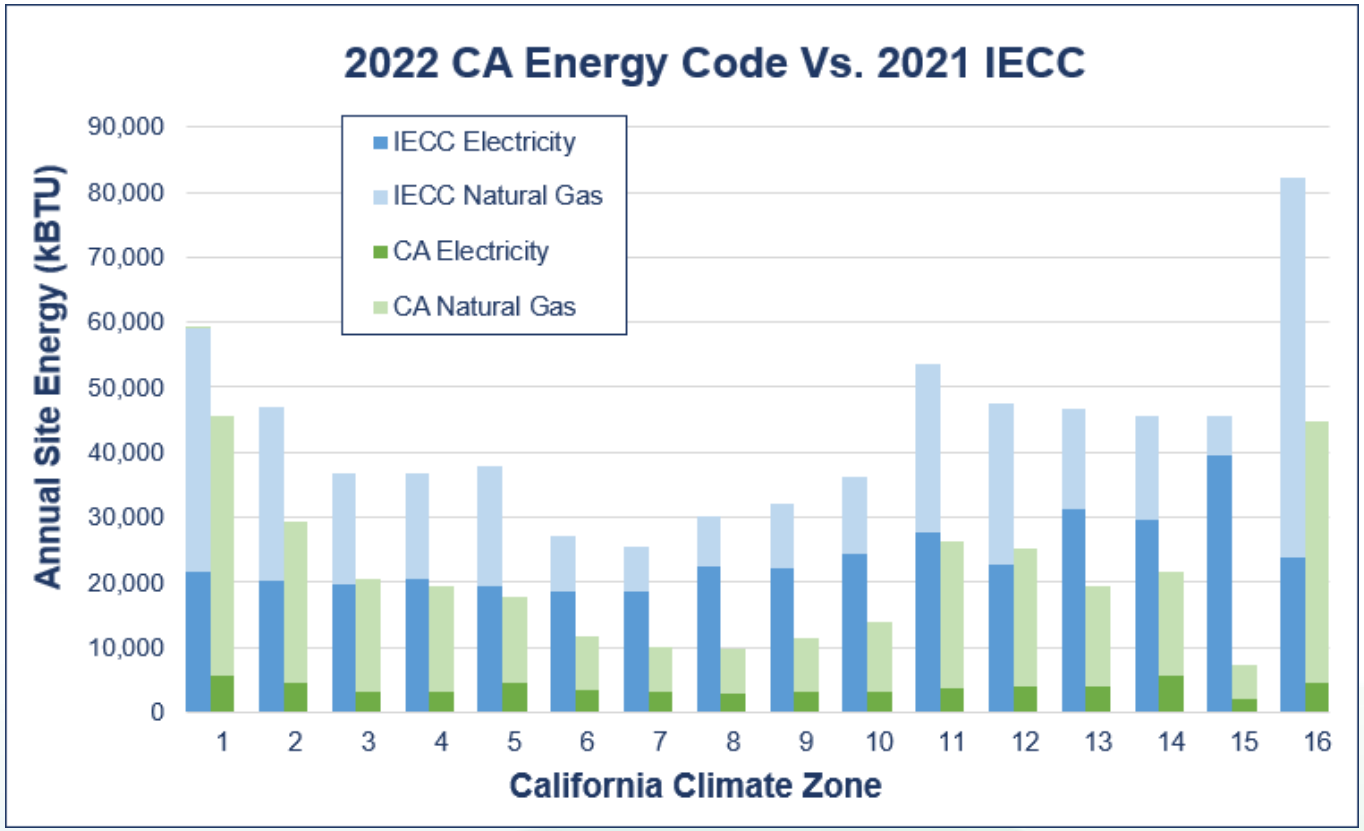
Javier Perez, Project Manager, 2025 Standards

April 17, 2024

California Energy Commission's Authority and 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
- Residential Chart Details:
  - Blue bars: Site energy of a single-family building built to 2021 International Energy Conservation Code (IECC)
  - Green bars: Site energy of a single-family building built to 2022 California Energy Code
- For more on how the 2022 Energy Code compares to federal standards, see our 2022 Impact Analysis at: https://www.energy.ca.gov/publications/2023/impact-analysis-2022-update-california-energy-code



2025 Energy Code Drivers and Themes

State Goals

- Increase building energy efficiency cost-effectively
- Contribute to the state's GHG reduction goals

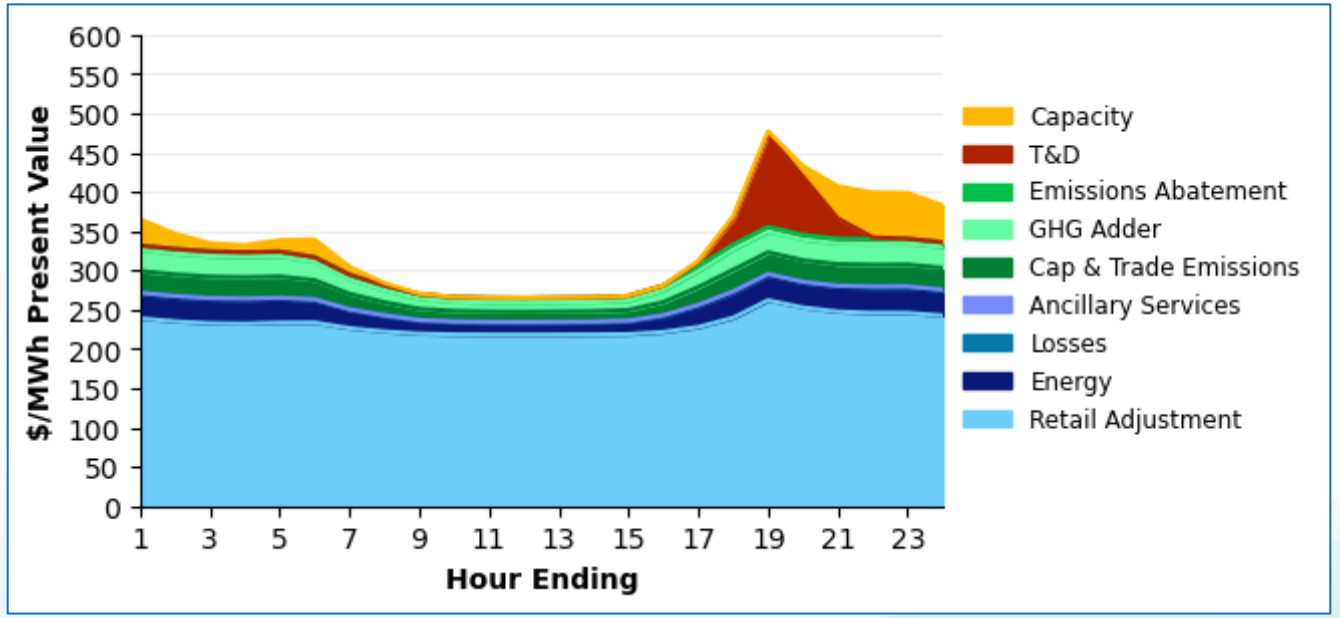
2025 Energy Code Strategies

- Heat pump baselines
- Promote demand flexibility, Solar PV generation and energy storage
- Covered process loads
- Equity & affordable new housing program integration
- Additions, alterations, and smaller homes (e.g., ADUs)
- Interagency coordination

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.



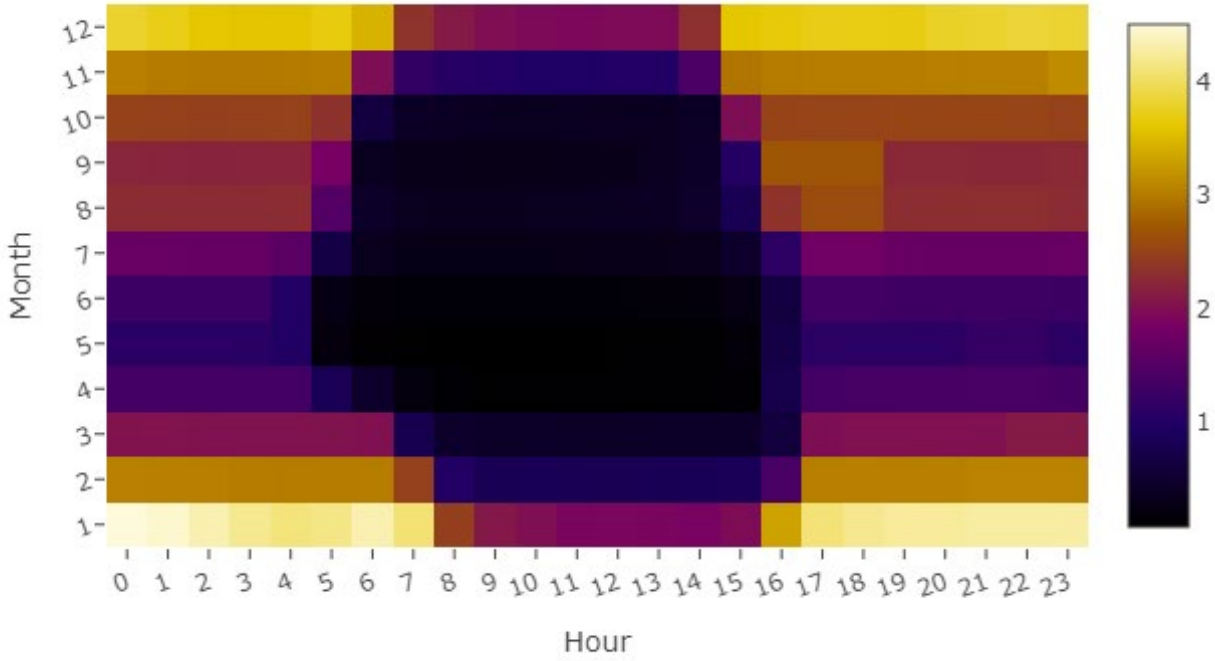
Sample LSC shape by component, average day, levelized 30-year residential, climate zone 12

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.

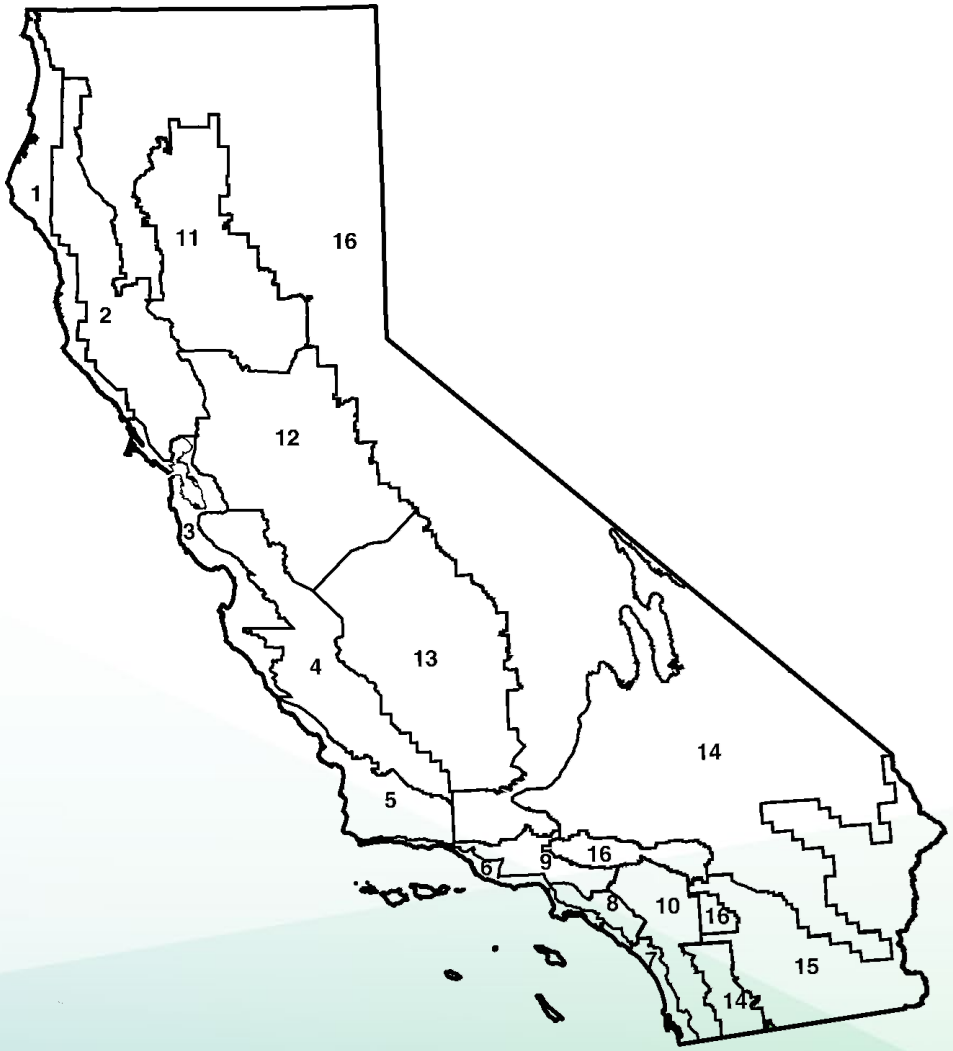
5-Month Average of electricity long run marginal source energy for 2025 Energy Code



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 Released Draft Express Terms	November 2023
CEC released 45-day Rulemaking Language	March 29, 2024

2025 Cycle Participation

Stakeholder Participation

- Over 60 different stakeholder groups participated
- Groups included:
  - Energy Consulting
  - Trade Groups
  - Engineering/Architecture Firms
  - Manufacturers
  - Building Industry
  - Environmental
  - ADU Advocates
  - Labs

2025 Energy Code Work To Come

Milestones	Timelines
Rulemaking 45-Day Public Comment Period	March 29, 2024 – May 13, 2024
Three-Day Lead Commissioner Hearings	April 16, 2024 – April 18, 2024
Rulemaking 15-Day Comment Period	June 2024
Adoption of 2025 Energy Code	August 14, 2024
Building Standards Commission Approval of 2025 Energy Code	December 2024
Manuals, Software, and Forms Updates	July 2024 – March 2025
2025 Energy Code Effective Date	January 2026

2025 Energy Code Senior Staff Contacts

- **Javier Perez** – Project Manager
- **Payam Bozorgchami** – Technical Lead, Envelope, Additions and Alterations, ADUs
- **Haile Bucaneg** – Covered Process, Demand Response, Nonresidential and Residential ACM
- **Muhammad Saeed** – Solar Photovoltaic and Energy Storage Systems
- **Bach Tsan** – HVAC Systems, Refrigeration
- **Michael Shewmaker** - Supervisor, Standards Development Unit
- **Gypsy Achong** – Branch Manager, Building Standards
- **Email Convention at the Energy Commission:** firstname.lastname@energy.ca.gov

2025 Building Energy Efficiency Standards (Title 24, Part 6)

Proposed Changes to Covered Processes

Presenter(s): Haile Bucaneg, Senior Mechanical Engineer

Date: April 17, 2024

Covered Process Pipe Insulation

Section 120.3: Pipe Insulation – General Requirements

Section 120.3(a) General requirements.

- Add process heating and cooling piping.

Table 120.3 Pipe Insulation Thickness

- Separate table between heating and cooling.
- Include process heating and process cooling piping

Section 141.1: Pipe Insulation – Additions and Alterations

Section 141.1(d) Process piping.

- Process piping insulation requirements for additions and alterations.

Pipe Insulation – Definitions

Section 100.1 Definition for covered processes.

- Include process heating and cooling piping.

Controlled Environment Horticulture

Section 120.6: Controlled Environment Horticulture

Section 120.6(h):

- Increase the minimum horticultural lighting photosynthetic photon efficacy (PPE) to 2.3 μmol/J for both indoor grows and greenhouses
- Combine horticultural lighting requirements for indoor grows and greenhouses into one

Section 141.1: Controlled Environment Horticulture

Section 141.1(c):

- Update references to the appropriate sections
- Combine horticultural lighting language for both indoor grows and greenhouses

Commercial Kitchens

Section: 120.6– Mandatory Requirements

Section 120.6(k) – Mandatory requirements for commercial kitchens

- Quick Service and Institutional Kitchens
  - Branch circuits 50 amps
  - Service capacity 800 connected amps
- Service panels must accommodate 208V or 240V 50 amp breaker

Definitions – Commercial Kitchens

Section 100.1 – Definitions and rules of constructions.

- Kitchen definitions added to clarify types of kitchens for various establishments
  - Full-Service Commercial
  - Institutional Commercial
  - Quick-Service Commercial

Refrigeration

Section 120.6: Refrigerated Warehouses – Evaporator Efficiency

Section 120.6(a)3D Evaporator specific efficiency.

- Description of evaporator specific efficiency.
- Exception for quick chilling or quick freezing.

Section 120.6(a)3E Evaporator static pressure drop.

- Not to exceed 0.5 inch water.
- Exception for quick chilling or quick freezing.

Section 120.6: Evaporator – Minimum Specific Efficiency

Table 120.6-F Fan Powered Evaporators – Minimum Specific Efficiency Requirements.

- Dependent on evaporator type.

Evaporator Type	Direct Expansion Ammonia	Liquid Overfeed Ammonia	Direct Expansion CO2	Liquid Overfeed CO2	Direct Expansion Halocarbon
Cooler/Dock	35 Btuh/Watt	50 Btuh/Watt	35 Btuh/Watt	50 Btuh/Watt	45 Btuh/Watt
Freezer	25 Btuh/Watt	45 Btuh/Watt	25 Btuh/Watt	45 Btuh/Watt	40 Btuh/Watt

Refrigerated Warehouses – Definitions

Section 100.1 – Definitions and rules of constructions.

- Definition for AHRI 420 added.

Laboratories

Section 140.9: Laboratory Exhaust Systems – Airflow Reduction Requirements

Section 140.9(c)1 Airflow reduction requirements.

- Not limited to laboratories with circulation rates of 10 ACH or less.
- Occupied minimum exhaust airflow.
  - Not to exceed1.0 cfm/ft^2
- Unoccupied minimum exhaust airflow.
  - Not to exceed 0.67 cfm/ft^2
- Comply with code, accreditation, or health and safety requirements
- Maintain pressurization.

Section 140.9: Laboratory Exhaust Systems – Fan System Power Consumption

Section 140.9(c)3 Fan system power consumption.

- Description of exhaust air and exhaust fan system airflow rates.
- Update reference to ANSI Z9.5-2022.
- Add option to meet fan power budget.
  - Fan power budget per Section 140.4(c)1A.
  - Fan system electrical power input per Section 140.4(c)1B.

Section 140.9: Laboratory Exhaust Systems – Exhaust System Controls

Section 140.9(c)3D Exhaust system controls.

- Occupied minimum circulation rates a minimum of 60% of the exhaust fan system design airflow rate.
- Fan system shall not use more than 40% of the design fan power at 60% of the design airflow rate.
- Fan system power not to exceed 1.3 watts/cfm.

Section 140.9: Laboratory Exhaust Systems – Exhaust System Controls Continued

Section 140.9(c)3Dv Exhaust system controls.

- Simple turndown controls.
- Wind responsive controls.
- Contaminant monitored controls.

Section 140.9: Laboratory Exhaust Systems – Reheat Limitation

Section 140.9(c)5 Reheat limitation.

- Air handlers for buildings with 20,000 cfm of laboratory exhaust.
- Serve multiple laboratory space conditioning zones
- Exceptions for humidity, biosafety level 3 or higher, and for vivarium spaces.

Section 140.9: Laboratory Exhaust Systems – Exhaust Air Heat Recovery

Section 140.9(c)6 Exhaust air heat recovery.

- Buildings with 10,000 cfm of laboratory exhaust.
- Exhaust air heat recovery requirements.
  - Sensible energy recovery ratio 45% at heating design conditions.
  - Sensible energy recovery ratio 25% at cooling design conditions.
  - Recovery from at least 75% of all lab exhaust air volume.
  - Ability to disable heat recovery.
- Exceptions for climate zone 6, heat recovery chillers design to provide at least 40% of peak heating load from exhaust heat recovery, exhaust systems requiring wash down systems.

Section 141.1: Laboratory Exhaust Systems – Additions and Alterations

Section 141.1(a) Lab and process facility exhaust system.

- Language cleanup to reduce redundancy.

NA7.16: Laboratory Exhaust Systems – Acceptance Test

NA7.16 Lab exhaust ventilation system acceptance test.

- Occupancy control.
- Simple turndown controls.
- Wind responsive controls.
- Monitored contaminant controls.

Questions/Public Comment Period

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- Thank you for participating!

15-minute Break

We will resume at 10:20

2025 Building Energy Efficiency Standards (Title 24, Part 6)

Proposed Changes to Section 120.0 – 120.9, NR Mandatory Measures

Presenter(s): Ronald Balneg, Mechanical Engineer

Date: April 17, 2024

Section: 120.1 – Mandatory Requirements

Section 120.1(c)2 Natural Ventilation

- Editorial changes
- Moving mechanical ventilation requirements from the section header into the list of requirements under subsection D for clarity
- Updating language to similar language used in ASHRAE 62.1 when referenced
- Moving the subsection exceptions to mechanical ventilation to reference the new subsection D.

Section: 120.1 – Mandatory Requirements

Section 120.1(c)3 & Table 120.1-A –Mechanical Ventilation

- Editorial changes
- Re-implementing the Greater of Area Method vs Person Method and updating Table 120.1-A to reflect the changes with Occupant Load Density and Minimum Area-based Ventilation Rates

Section: 120.1 – Mandatory Requirements

Section 120.1(c)2 Occupied - Standby Zone Controls

- Clarify the requirements and provide a list of examples of spaces that require occupant sensors for ventilation
- Tables 120.1-B & C – Updates to the tables to match ASHRAE 62.1 - 2022

Section: 120.2 – Mandatory Requirements

Section 120.2(l) – HVAC Hot Water Temperature

- Limit hot water supply temperature to no greater than 130 °F

Section: 120.5 – Mandatory Requirements

Section 120.5(a)4 – Mechanical system acceptance test

- Clarify 120.5(a)4 testing includes DOAS, HRV or ERV systems
- Clarify language in the exception to functional testing

Section 120.7 – Mandatory Requirements for Building Envelopes

Section 120.7 – Mandatory Requirements for Building Envelopes

- Rename section – now applicable to entire building envelope, and not just insulation.

Section 120.7(d) – Mandatory Exterior Windows

- Add new requirement – maximum U-factor = 0.47

Section 120.7 – Mandatory Requirements For Building Envelopes

Section 120.7(e) – Mandatory Vestibules

- Add new requirement – public entrances in buildings of Occupancy Types A, B, E, I and M shall include an enclosed vestibule.
  - Doors shall be equipped with self-closing devices; and
  - Heating and cooling systems for heated vestibules and air curtains shall be controlled.

Section 120.7 – Mandatory Requirements For Building Envelopes

Section 120.7(e) – Mandatory Vestibules (continued)

- Exceptions to 120.7(e):
  1. Doors not intended for public use.
  2. Doors that open directly from a sleeping/dwelling unit.
  3. Doors that open direct from space < 3,000-ft^2 in area.
  4. Revolving doors.
  5. Doors used primarily for vehicular movement or materials.
  6. Doors that has air curtains.
  7. Public entrances in buildings less than four stories, and less than 10,000-ft^2 in gross conditioned floor area, in CZs 2-13.

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2025 Building Energy Efficiency Standards (Title 24, Part 6)

Proposed Changes to Lighting and Electric Power Distribution

Presenter(s): Simon Lee, P.E., Electrical Engineer

Date: April 17, 2024

§130.1 Mandatory Nonresidential Lighting Controls

Section 130.1(a) Manual Controls

- Rename the section (was Manual Area Controls)
- Change “area enclosed by ceiling partitions” to “indoor space”.
- Other editorial changes: Use the term “space” in lieu of “area”. Delete Exception 1 and merge part of it as Section 130.1(a)2.
- These changes apply to Multifamily buildings and Section 160.5(b)4A.

Section 130.1(b) Multilevel Lighting Controls

- Delete Table 130.1-A. Delete subsection (b)1 and (b)2.
- Keep the requirements - “to provide continuous dimming from 100 percent to 10 percent” to the section.
- Other editorial changes: Use the term “space” instead of “area enclosed by ceiling height”. Use “greater than” instead of “exceeds”.
- 45-Day to 15-Day: May revise one part of the language so that it reads as “indoor space”.
- These changes apply to Multifamily buildings and Section 160.5(b)4B.

§130.1 Mandatory Nonresidential Lighting Controls

Section 130.1(c) Shut-off Controls

Occupant Sensing Controls

- Include ‘Set to no more than a 20-minute time delay’.
- Offices greater than 250 square feet: show the control zones information on plans.
- Editorial changes to use similar wordings, “reduce to no more than 20 percent of full power”. Section 130.1(c)6Dii and iv.

Others

- Clarify the means of egress illumination and the emergency lighting
- Consolidate subsections to Section 130.1(c)6 Occupant Sensing Controls.
  - Section 130.1(c)6C stairwell and corridor controls (was in Section 130.1(c)7A).
  - Section 130.1(c)6E parking space controls (was in Section 130.1(c)7B).
- Editorial: remove redundant phrasing.

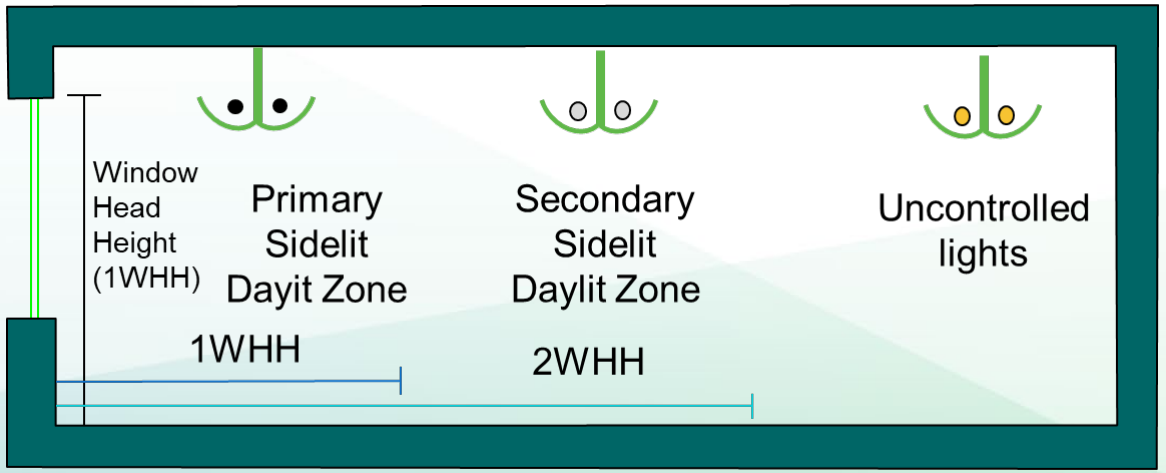
These changes apply to Multifamily buildings and Section 160.5(b)4C.

§130.1 Mandatory Nonresidential Lighting Controls

Section 130.1(d) Daylight Responsive Controls

- Changes based on the 2025 code change measure:
  - Revise and lower the lighting power wattage threshold of the automatic daylighting controls requirements. New trigger threshold of 75 watts or greater for skylit, primary sidelit, and secondary sidelit daylit zones.
  - Exception for secondary sidelit daylit zones with less than 85 watts (and where the primary sidelit daylit zones are not required for daylight controls).
  - Clarify segmentation of linear luminaires across daylit zones
- Rename the section (was “Automatic Daylighting Controls”)
- General code language clean up
- Interactions with other lighting controls.

These changes apply to Multifamily buildings and Section 160.5(b)4D.



§130.1 Mandatory Nonresidential Lighting Controls

Section 130.1(f) Occupancy Sensing Controls Interactions With Space-conditioning Systems

- Rename the Section (was “Control Interactions”)

- Reorganization:
  - Move the control interactions language about daylighting controls to the daylighting Section 130.1(c). Delete all other subsections / language.
  - Retain the text/language about occupancy sensing controls interactions with space-conditioning systems.

These changes apply to Multifamily buildings and Section 160.5(b)4F.

§130.2 Mandatory Nonresidential Lighting Controls

Section 130.2 Outdoor Lighting Controls And Equipment

Automatic Scheduling Controls

- Delete “no more than 90 percent”.

Motion Sensing Controls

- Delete “no more than 90 percent”.
- No longer mandate the controls for lighting applications of building facades, ornamental hardscape, and outdoor dining.
- Consolidate the language and reduce the number of sections. List the required lighting applications to meet the controls requirements.

These changes apply to Multifamily buildings and Section 160.5(c).

§130.4 Mandatory Nonresidential Lighting Control Acceptance Requirements

Section 130.4(a) - Lighting acceptance requirements

- Add horticulture spaces - Section 120.6(h)5B - required for meeting the lighting acceptance requirements.

§130.5 Mandatory Nonresidential Electrical Power Distribution Systems

Section 130.5(d) Circuit Controls For 120-Volt Receptacles and Controlled Receptacles

- Replace “splitwired receptacle” with “multiple receptacle”.
- Delete “durable” from the permanent marking language.

- Align the “time delay to off” period to 20 minutes.
- Move the note about “hardwired power-strip, plug-in strips and plug-in devices” as part of the section language.

These changes apply to Multifamily buildings and Section 160.6(d).

§140.6 Prescriptive Indoor Lighting Requirements

Section 140.6 Prescriptive Requirements For Indoor Lighting

Reduction of Wattage through controls, Section 140.6(a)2:

- Remove duplication of portable lighting allowance – the Exception to Section 140.6(a).
- Clarify the PAF:
  - Add occupant sensing control information on the plans – add to the PAF requirements – for offices greater than 250 square feet. Section 140.6(a)2Iv
  - Add a clarifying language for the demand responsive controls PAF. Section 140.6(a)2Kii and Table 140.6-A
- Revise the definition (§100.1) of Temporary Lighting - to align with California Electrical Code.

These changes apply to Multifamily buildings and Section 170.2(e).

§140.6 Prescriptive Indoor Lighting Requirements

Section 140.6 - Lighting Compliance Methods

- Changes to Area Method and Tailored Method; Simplify the compliance:
  - Remove the Tailored method.
  - A revised Table 140.6-C Area Category Method
  - Removal of tables 140.6-D, E, F, and G. (table used for the Tailored Method)
  - Removal of sections related to the Tailored method.

- Provided and added additional lighting power allowances under the Area Category Method.
  - "Convention, Conference, Multipurpose and Meeting Area", "Bar/Lounge and Fine Dining", "Lobby, Main Entry", "Grocery Sales", "Retail Merchandise Sales". (specified in Table 140.6-C)

These changes apply to Multifamily buildings and Section 170.2(e)3 and 4.

§140.6 Prescriptive Indoor Lighting Requirements

Table 140.6-C (shown partially):

Primary Function Area	General Lighting Power in watt per square feet	Additional Lighting Power for various types of lighting applications	Additional Lighting Power in watt per feet or square feet
Convention, Conference, Multipurpose and Meeting Area	0.75 (W/ft^2)	Decorative	0.25 (W/ft^2)
		Wall Display MH <= 10'6"	**2 W/ft**
		Wall Display MH 10'7"- 14'	**2.35 W/ft**
		Wall Display MH > 14'	**2.66 W/ft**
		Floor Display & Task MH <= 10'6"	**0.30 (W/ft^2)**
		Floor Display & Task MH 10'7"- 14'	**0.35 (W/ft^2)**
		Floor Display & Task MH > 14'	**0.40 (W/ft^2)**

These changes apply to Multifamily buildings and Table 170.2-M.

§140.7/8 Prescriptive Outdoor Lighting & Sign Lighting Requirements

Section 140.7 – Prescriptive Requirements for Outdoor Lighting

- Add notes to Table 140.7-B the “Additional Lighting Power Allowance for Specific Application”
- Add a note to clarify “Special Security Lighting for Retail Parking and Pedestrian Hardscape”.
- Add a note to clarify "security camera" lighting allowances.

These changes apply to Multifamily Section 170.2(e)6 and Table 170.2-S.

Section 140.8 – Prescriptive Requirements for Signs

- Remove legacy sign lighting light sources including high pressure sodium lamps, metal halide lamps and fluorescent lamps.

These changes apply to Multifamily Section 170.2(e)7.

JA8 & JA10 Requirements for Light Sources

Joint Appendix JA8 - Qualification Requirements for High Luminous Efficacy Light Sources

- Remove the portion of the JA8 performance criteria and the test requirements for incandescent lamps and fluorescent lamps.
- Remove reference to the ENERGY STAR test methods – the start time test and the noise test. Add the test methods to JA8.

Joint Appendix JA10 – Flicker Test

- Remove the portion of the test criteria and the test requirements for fluorescent lamps.

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Lunch

We will resume at 1:00

2025 Building Energy Efficiency Standards (Title 24, Part 6)

Proposed Changes to Sections 140.3, 140.4, and 141

Presenter(s): Bach Tsan, P.E., Senior Mechanical Engineer

Date: April 17, 2024

Table 140.3-B Prescriptive Envelope Criteria for NR Buildings

Table 140.3-B – Prescriptive Envelope Criteria for NR Buildings

- Reduced maximum U-factors as follows:
  - Roofs and Ceilings
    - Metal Building – in all CZs (1-16)
    - Wood Framed and Other – in all CZs (1-16)
  - Walls
    - Metal Building – in all CZs (1-16)
    - Mass, Light – in all CZs (1-16)
    - Mass, Heavy – in CZs 1 & 11-16
    - Wood Framed and Other – in all CZs (1-16)

2025 Heat Pump Baseline Medium Office, Large Office, Large Schools

2022 Nonresidential Prescriptive HVAC Requirements

2022 Energy Code established requirements for single zone systems with direct expansion cooling ≤ 240,000 Btu/hr in Section 140.4(a)2 A through H

Schools

- Climate Zones 2-15: Heat Pump (HP)
- Climate Zones 1, 16: Dual-fuel HP

Retail and Grocery

- Climate Zones 2-15: HP
- Climate Zones 1, 16:
  - Cooling capacity < 65,000 Btu/hr: Furnace A/C
  - Cooling capacity ≥ 65,000 Btu/hr: Dual-fuel HP

Offices, Financial Institutions and Libraries

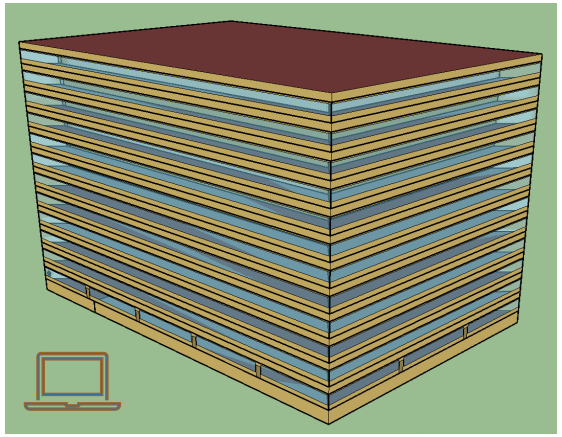
- Climate Zones 1-15: Heat Pump
- Climate Zone 16:
  - Cooling capacity < 65,000 Btu/hr: Furnace A/C
  - Cooling capacity ≥ 65,000 Btu/hr: Dual-fuel Heat Pump

Offices in Warehouses

- Climate Zones 1-16: Heat Pump

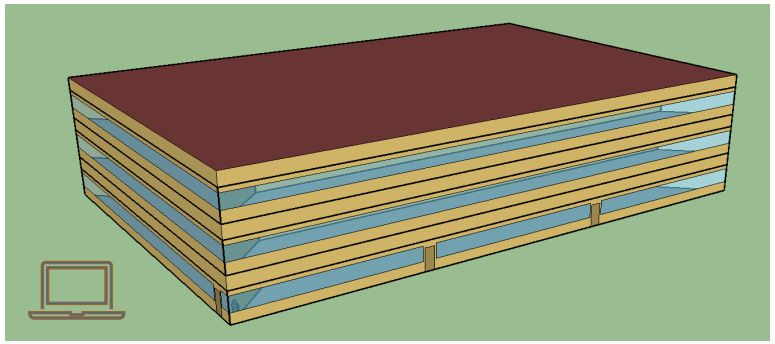
Prescriptive Building Prototypes

Large Office



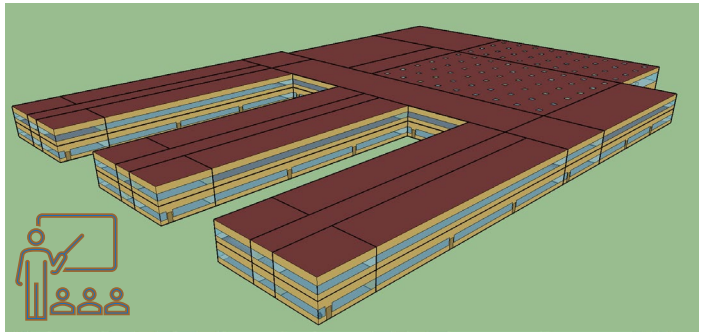
- 500,000 sf
- 12-story, 1-story basement

Medium Office



- 53,600 sf
- 3-story

Large School



- 210,900 sf
- 2-story

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Nonresidential System Mapping

Total conditioned floor area

Medium and Large Offices (Office, financial institution, and library)	Floors	CZ	Capacity	2025 System	2022 System
< 25,000 ft^2	4 - 5 floors	All	No limit	System 15 - VRF + DOAS	System 5 – PVAV
25,000 – 150,000 ft^2	≤ 5 floors	All	No limit	System 15 - VRF + DOAS	System 5 – PVAV
≤ 150,000 ft^2	> 5 floors	All	No limit	System 14 - AWHP+FPFC	System 6 – VAV
> 150,000 ft^2	No limit	All	No limit	System 14 - AWHP+FPFC	System 6 – VAV

Large Schools	Floors	CZ	Capacity	2025 System	2022 System
≤ 150,000 ft^2	> 5 floors	All	No limit	System 14 – AWHP+FPFC	N/A
> 150,000 ft^2	No limit	All	No limit	System 14 – AWHP+FPFC	N/A

AWHP – Air to Water Heat Pump
CZ – Climate Zones
DOAS – Dedicated Outside Air System
FPFC – Four Pipe Fan Coil

FPFC – Four Pipe Fan Coil
PVAV – Packaged Variable Air Volume
VAV- Variable Air Volume

Section 140.4 – Prescriptive Requirements for Multizone Space Conditioning Systems

Section 140.4(a)3 - Multizone zone space-conditioning system types:

- Adds a new section titled "Multizone zone space-conditioning system types "
- Establishes specific and tailored requirements for Medium Offices, Large Offices and Large Schools
  - Single zone space conditioning systems previously addressed in Section 140.4(a)2

CEC considering modifications in 15-day language – such as:

- *140.4(a)3F: A space conditioning system determined by the Executive Director to use no more energy than the systems specified in 140.4(a)3 consistent with 10-109(h)*

Section 140.4(a)3A – Medium, Large Offices

Section 140.4(a)3A:

- Requirements for multizone space conditioning systems in office buildings

Section 140.4(a)3Ai – Medium Office

- Defines the building envelope, lighting systems, systems, and other energy-consuming components
- Introduces system features such as variable refrigerant flow, dedicated outdoor air systems, and heat recovery systems

Section 140.4(a)3Aii – Large Office

- Prescriptively specifies system requirements:
  - Air-to-Water Heat Pump (AWHP) serving a four-pipe fan coil (FPFC) system, Demand Control Ventilation (DCV) with a Dedicated Outdoor Air System (DOAS) providing ventilation; or

- **Section 140.4(a)3Aiii**
  - Recirculated air heating system with hydronic air terminals

Section 140.4(a)3B – School Buildings

Section 140.4(a)3B – School Buildings:

- Requirements for multizone space conditioning systems in School Buildings

Section 140.4(a)3B

- Prescriptively specifies the use of heating through a hot water loop served by an Air-to-Water Heat Pump (AWHP)
  - Four Pipe Fan Coil (FPFC)
  - Dedicated Outside Air System (DOAS)
  - Heat Recovery Ventilation with bypass; performs economizer function

Section 140.4(a)3C – Air to Water Heat Pump space heating water loop

Section 140.4(a)3C – AWHP space-heating hot water loop.

- Adds prescriptive requirements for AWHP space heating performance
  - Must have a COP ≥ 3.29 at specific outdoor temperatures. (47F DB and 43F WB)
  - Maintain design supply water temperature in the hot water loop.
  - AWHP-produced chilled water for cooling is permitted only when concurrently meeting space heating demands.
  - Hot water loop fluid volume must be ≥ 8 gallons per nominal ton of heating capacity.
  - Supplemental heating via electric resistance boiler limited to ≤ 50% of loop's design heating capacity.

Section 140.4(a)3D – Indoor fans

Section: 140.4(a)3D – Indoor fans

- Establish energy-efficiency standards for fan systems in office and school buildings served by multi-zone space-conditioning systems
  - Indoor fans must consume no more than 0.35 W/cfm at design airflow.
  - Must have at least three speeds.
  - Should automatically turn off when heating or cooling is not needed

Section 140.4(a)3E – DOAS

Section: 140.4(a)3E – DOAS

- Multizone space conditioning systems subject to this section must comply with Section 140.4(p) and 140.4(q)
  - DOAS must adhere to Section 140.4(p).
  - Must include a heat recovery system as per Section 140.4(q).
  - Maximum fan energy consumption set at 0.77 W/cfm at design airflow.
  - If heating coils are used, they must be hydronic and connected to the AWHP space-heating hot water loop.
  - If cooling coils are used, they must be hydronic and use space-cooling chilled water.

- **EXCEPTION to Section 140.4(a)3E:** If the building's design does not include an AWHP for the space-heating hot water loop or a system for space-cooling chilled water, the DOAS can instead use heat pump coils for both heating and cooling.

Nonresidential HVAC Controls Requirement

Adds a Guideline 36 compliance requirement as follows:

- **Section 140.4(c)2 Variable Air Volume Systems**
  - VAV system static pressure setpoint reset control.
- **Section 140.4(d)2.A.v Zone with Direct Digital Controls (DDC)**
  - Space-conditioning zones with DDC.
- **Section 140.4(e)2.D Economizers**
  - Economizers.
- **Section 140.4(f)3 Supply air temperature reset controls**
  - Supply air temperature setpoint reset.

Nonresidential HVAC Controls Requirements (continued)

Section 140.4(r) DDC Controller Logic

- Requires HVAC systems with DDC to use:
  - ASHRAE Guideline 36 programming libraries.
  - Controller logic originating from a programming library based on sequences of operation from ASHRAE Guideline 36.

Exceptions:
Exception 1 to Section 140.4(r): Logic from the certified programming library modified to suit application-specific operation that are not included in Guideline 36 sequences.

Exception 2 to Section 140.4(r): Systems serving healthcare facilities.

Exception 1 to Section 140.4(r)3: Non-programmable (configurable-only) controllers for zone terminal units shall follow applicable ASHRAE Guideline 36 zone sequences referenced in JA18 Table 18.3-1 but are not subject to programming library requirement in Section 140.4(r)3.

JA18 Guideline 36 Programming Library Requirements

Joint Appendix JA18 - Guideline 36 Programming Library Certification Submittal Requirements

- **Define Certification Requirements**
  - For HVAC system programming libraries as per Section 140.4(r).
- **Mandatory for Building Automation System (BAS) Manufacturers/Controls Suppliers**
  - Must certify Guideline 36 libraries according to Title 24, Part 6.
- **Reference Document: JA18**
  - Detailed certification process, requirements, and declaration form.
- **Focus on Guideline 36 Library Compliance**
  - Essential for manufacturers and suppliers aiming for certification.

Section: 140.4 – Prescriptive Requirements for Multizone Space Conditioning Systems

Section 140.4(s) Mechanical Heat Recovery

- New simultaneous mechanical heat recovery requirements for large building loads
- Equations to determine threshold
- Exceptions for laboratories and some buildings in climate zone 15
- New heat recovery requirements for service water heating

Section: 140.4 – Prescriptive Requirements for Multizone Space Conditioning Systems

Section 140.4(s)2 Heat Recovery for Service Water Heating

- Service hot water capacity ≥ 500 kBtuh
- Must transfer smaller of:
  - 30% of peak heat rejection
  - 30% of service hot water capacity
- Exception for buildings with a computer room heat recovery system

Nonresidential Alterations

Section 141.0(b)2C – Alterations to Existing Nonresidential Space Conditioning Systems – Heat Pumps

Section 141.0(b)2C – New or Replacement Space-Conditioning Systems or Components

- Proposed new section prescribes heat pumps for new or replacement single-zone packaged rooftop systems < 65,000 btu/h where feasible and cost effective.
  - 141.0(b)2C was partially relocated to a new subsection, 141.0(b)2Ci, and
  - Section 141.0(b)2Cii was created to address the new prescriptive heat pump requirements for new or replacement single-zone packaged rooftop systems with a direct expansion cooling
  - 141.0(b)2Ciii was added to delineate specific instances where the prescriptive inclusion of an economizer is applicable

Section 141.0(b)2Cii – Replacement Single-Zone DX Rooftop Heat Pump Systems < 65,000 Btu/hr

Section 141.0(b)2Cii – Heat pumps prescribed for new or replacement single-zone DX rooftop systems under 65,000 Btu/hr:

- New requirement for new or replacement space conditioning systems for small schools, small offices, retail and library to have heat pump technology as the baseline
- Must adhere to Table 141.0-E-1 or Section 141.0(b)3 performance requirements.
- Air conditioners with variable speed fans should adjust airflow based on load, have minimum two-stage fan control, and use no more than 30% full-speed power at 50% fan speed.

Exception to Section 141.0(b)2Cii: Clarifies that when an alteration surpasses the capacity of the existing main service panel or service transformer, the provisions outlined in Section 141.0(b)2Cii no longer apply.

Section 141.0(b)2Ciii - Systems are required to follow Section 140.4(e) with the exception:

1. SZAC1, 2, 3 ~~and SZHP1~~ in Table 141.0-E-1 with rated cooling capacity less than 65,000 Btu/hr are required to have an economizer, and
2. All other single packaged air-cooled unitary air conditioners and heat pumps with rated cooling capacity equal to or greater than 54,000 Btu/hr are required to have an economizer.

Alternatives to Section 141.0(b)2Cii

Table 141.0-E-1 – NEW OR REPLACEMENT SINGLE ZONE AIR CONDITIONER OR HEAT PUMP REQUIREMENT

Building Area Type	CZ1	CZ2	CZ3	CZ4	CZ5	CZ6	CZ7	CZ8	CZ9	CZ10	CZ11	CZ12	CZ13	CZ14	CZ15	CZ16
Retail and grocery	NR	NR	SZHP or SZAC 1	SZHP or SZAC 1	SZHP or SZAC 1	SZHP or SZAC 1	SZHP or SZAC 1	SZHP or SZAC 1	SZHP or SZAC 1	SZHP or SZAC 1	SZHP or SZAC 1	SZHP or SZAC 1	SZHP or SZAC 1	NR	SZHP or SZAC 3	NR
School	SZHP or SZAC 2	SZHP or SZAC 2	SZHP or SZAC 2	SZHP or SZAC 2	SZHP or SZAC 1	SZHP or SZAC 1	SZHP or SZAC 2	SZHP or SZAC 1	SZHP or SZAC 2	SZHP or SZAC 2	SZHP or SZAC 2	SZHP or SZAC 2	SZHP or SZAC 2	SZHP or SZAC 2	SZHP or SZAC 2	NR
Office, financial institution	NR	NR	SZHP or SZAC 1	SZHP or SZAC 1	SZHP or SZAC 1	SZHP or SZAC 1	SZHP or SZAC 1	SZHP or SZAC 1	SZHP or SZAC 1	SZHP or SZAC 1	SZHP or SZAC 2	SZHP or SZAC 1	SZHP or SZAC 1	NR	SZHP or SZAC 2	NR
Library	SZHP or SZAC 1	NR	SZHP or SZAC 1	SZHP or SZAC 1	SZHP or SZAC 1	SZHP or SZAC 1	SZHP or SZAC 1	SZHP or SZAC 2	SZHP or SZAC 2	SZHP or SZAC 2	SZHP or SZAC 2	SZHP or SZAC 2	SZHP or SZAC 2	SZHP or SZAC 2	SZHP or SZAC 2	NR

Footnotes to Table 141.0-E-1

- SZHP – Single Zone Heat Pump
- SZAC – Single Zone Air Conditioner with furnace
- SZAC1 – Single Zone Air Conditioner with furnace + Economizer
- SZAC2 – Single Zone Air Conditioner with furnace + Economizer + Demand Controlled Ventilation
- SZAC3 – Single Zone Air Conditioner with furnace + Economizer + Variable Frequency Drive
- NR – No Requirement

Questions/Public Comment Period

Zoom App/Online

- Click “raise hand”

Telephone

- Press *9 to raise hand
- Press *6 to Mute/Unmute

When called upon

- CEC will open your line
- Unmute on your end
- Spell name and state affiliation, if any
- 2 minutes or less per speaker, 1 speaker per entity

Comments on the 2025 Codes

- **Comments on Todays Hearing**
- **Due Date: May 13, 2024, by 5:00 PM**

- **Comments to be submitted to: https://efiling.energy.ca.gov/Ecomment/Ecomment.aspx?docketnumber=24-BSTD-01**

- Thank you for participating!

15-minute Break

We will resume at ----

2025 Building Energy Efficiency Standards (Title 24, Part 6)

Proposed Changes to Sections 140.10 – Nonresidential PV and Battery

Presenter(s): Muhammad Saeed, P.E., Senior Electrical Engineer

Date: April 17, 2024

Nonresidential PV Requirements 140.10(a)

Nonresidential PV Sizing – 2025 Proposed Requirements

- **Prescriptive Approach:**
  - PV system size based on equation:
    - Minimum rated PV system capacity in kW
    - $kW_{PVdc,\ min} = (CFA \times \mathbf{A})/1000$
    - **A** = is the PV capacity factor in W/square foot that varies depending on climate zone and LSC
- **Performance Approach:**
  - PV system standard design size based on the equation above.
- **For Solar Access Roof Area (SARA) Limitations:**
  - Minimum PV required:
    - Roof pitch < 2:12: SARA x 14 W/ft^2
    - Roof pitch ≥ 2:12: SARA x 18 W/ft^2

Nonresidential PV Sizing – 2025 Proposed Requirements

- **The following building types require PV + battery:**
  - **Events & Exhibits**
  - Library
  - Hotel/Motel
  - Office, Financial Institution, Unleased Tenant Space
  - Restaurants
  - Retail, Grocery
  - School
  - Warehouse
  - **Religious Worship**
  - **Sports & Recreation**
  - Multifamily >3 habitable stories

Bold indicates new building types proposed for addition in the 2025 Energy Code

Nonresidential PV Sizing – 2025 Proposed Requirements

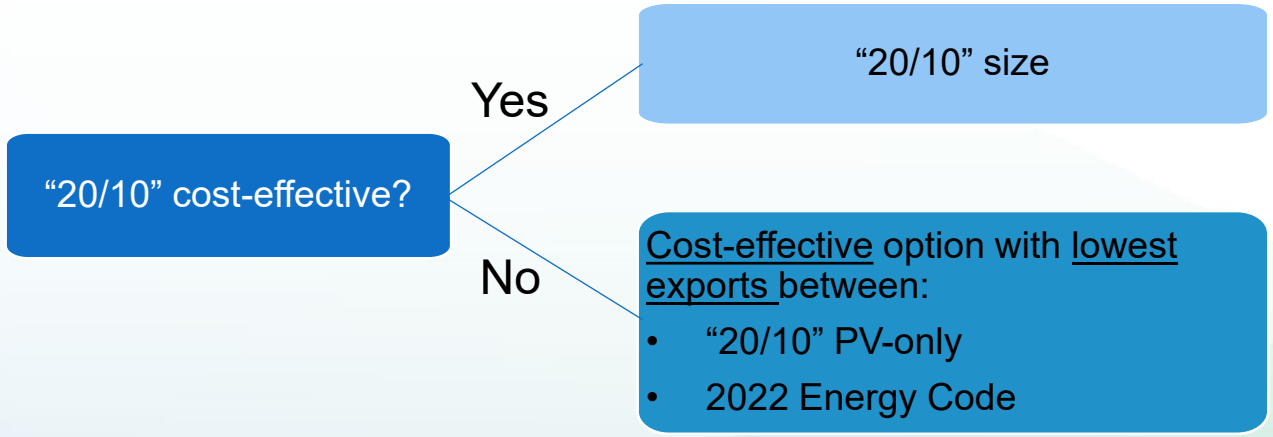
Table 140.10 – Factor A – Minimum PV Capacity (W/ft² of conditioned floor area)

Building Type	CZ1	CZ2	CZ3	CZ4	CZ5	CZ6	CZ7	CZ8	CZ9	CZ10	CZ11	CZ12	CZ13	CZ14	CZ15	CZ16
Events & Exhibits	**3.48**	**4.28**	**3.66**	**4.32**	**3.77**	**4.05**	**4.28**	**4.83**	**4.63**	**4.8**	**5.04**	**4.44**	**4.95**	**4.36**	**5.48**	**3.38**
Library	0.39	3.23	2.59	3.25	2.48	2.74	3.04	3.49	3.32	3.69	3.79	3.32	3.79	3.37	4.49	2.84
Hotel/Motel	1.69	1.9	1.66	1.97	1.69	1.87	1.94	2.22	2.09	2.2	2.3	2.05	2.3	2.02	2.72	1.73
Office, Financial Institution, Unleased Tenant Space	2.59	3.13	2.59	3.13	2.59	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.8	2.59
Restaurants	8.55	9.32	8.16	9.65	8.21	8.73	9.11	10.18	9.75	10.28	10.85	9.73	10.69	9.73	12.25	8.47
Retail, Grocery	3.14	3.49	3.01	3.61	3.05	3.27	3.45	3.83	3.65	3.81	4.09	3.64	3.99	3.71	4.6	3.21
School	1.27	1.63	1.27	1.63	1.27	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	2.46	1.27
Warehouse	0.39	0.44	0.39	0.44	0.39	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.58	0.39
Religious Worship	**4.25**	**4.65**	**3.49**	**4.52**	**3.72**	**4.29**	**4.64**	**5.89**	**5.3**	**5.67**	**5.89**	**4.99**	**5.78**	**4.63**	**7.57**	**3.9**
Sports & Recreation	**2.47**	**1.97**	**1.54**	**2.03**	**1.6**	**1.84**	**1.98**	**2.63**	**2.47**	**2.6**	**2.75**	**2.2**	**2.72**	**2.15**	**4.03**	**1.81**
Multifamily >3 stories	1.82	2.21	1.82	2.21	1.82	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.77	1.82

Bold indicates new building types; Box indicates updated requirement

Nonresidential PV Sizing – 2025 Proposed Requirements

- Two sets of PV/Battery sizing analyses based on:
  - "20/10" export i.e. 20% annual generated electricity exported, with battery capacity to reduce exports to 10%
  - 2022 Energy Code
- Prototype PV/Battery size requirements selected as follows:



Nonresidential PV Sizing – 2025 Proposed Requirements

For multi-tenant nonresidential buildings:

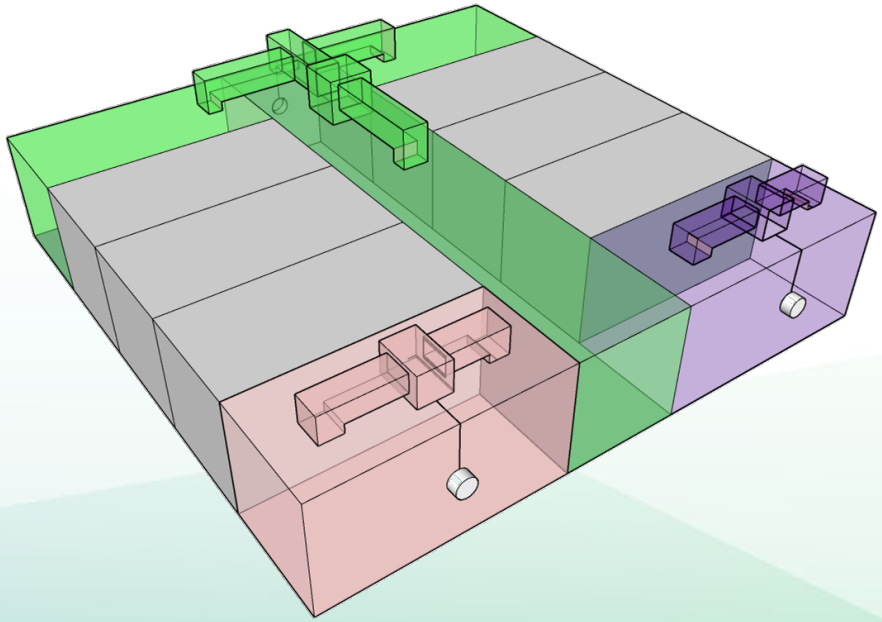
- **Removed Exception 5 to Section 140.10(a):**

  No PV for load-serving entities that don't offer VNEM or Community Solar

- **New Exception 5 to Section 140.10(a):**

  For nonresidential and hotel/motel multitenant buildings, the PV capacity determined by Equation 140.10-A shall be calculated without including tenant spaces that meet all of the following:

  i. The tenant space is less than or equal to 2,000 square feet of conditioned space;
  ii. The tenant space is served by an individual HVAC system that does not serve other spaces in the building; and
  iii. The tenant space has an individual utility meter to track electricity consumption that does not include the electricity consumption of other spaces in the building.



Nonresidential PV Sizing – 2025 Proposed Requirements

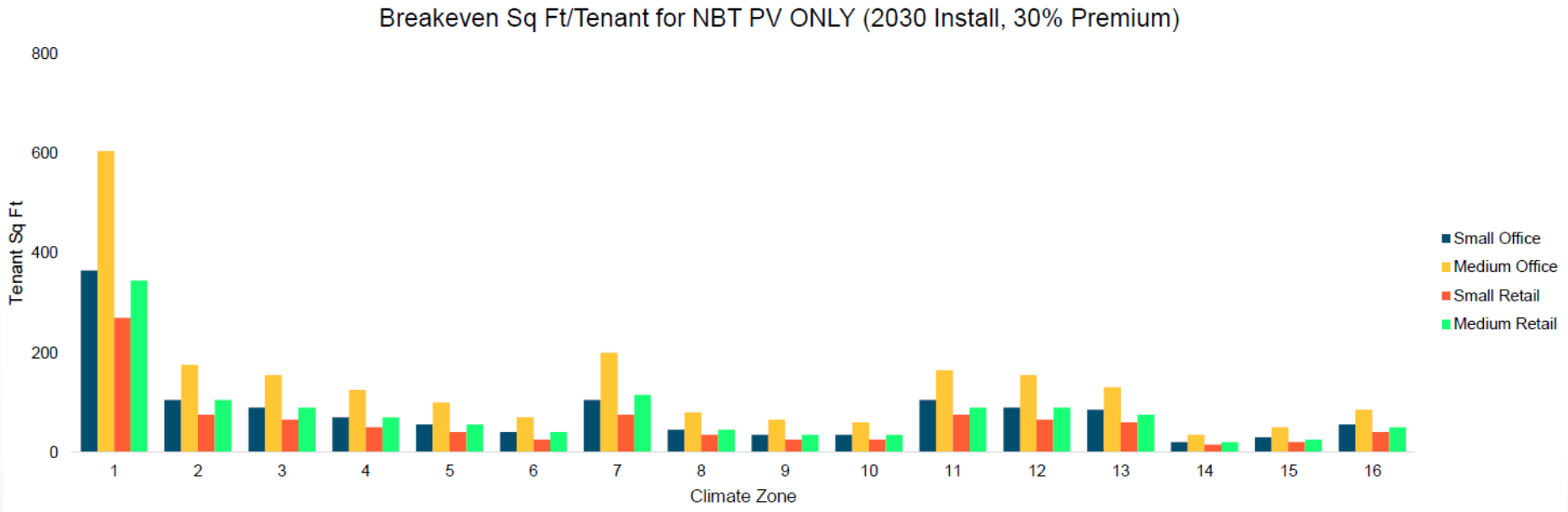
New Exception 5 to Section 140.10(a) for nonresidential multi-tenant buildings **does not apply** where:

- The Commission has approved **a community solar program** for showing compliance as specified in Title 24, Part 1, Section 10-115
- A **program** where PV generation is compensated through **virtual** energy bill credits for occupants of nonresidential and hotel/motel tenant spaces to receive energy bill benefits from **netting of energy generation and consumption**.

Nonresidential PV Sizing – 2025 Proposed Requirements

Tenant Space Square Footage	PV Installation cost Percentage increase from 2025 assumptions without VNEM
2,500	20
5,000	26
10,000	37
25,000	44

Breakeven square footage by tenant, supporting Exception 5 to Section 140.10(a))for multi-tenant buildings:



Nonresidential Battery Storage Requirements 140.10(b)

Nonresidential Battery Energy Storage Sizing – 2025 Proposed Requirements

- **Prescriptive Approach:**
  - Battery system size based on equation:
    - Minimum Rated Useable Energy Capacity of the Battery Energy Storage System (BESS) in kWh

      $kWhbatt = ((CFA \times B)/(1000 \times C^{0.5}))$

      SARA adjusted: $kWhbatt = ((CFA \times B)/(1000 \times C^{0.5})) \times (kWPVdc,SARA / kWPVdc)$
    - Minimum Rated Power Capacity of the BESS in kWdc

      $kWh_{batt}/4$

    B = BESS Capacity Factor in Wh/square foot

    C = Rated single charge-discharge cycle AC to AC (round-trip) efficiency of the BESS
- In mixed occupancy buildings, the total battery system capacity for the building shall be determined by applying the Minimum Rated Usable Energy Capacity to each of the listed building types and summing the capacities determined for each.
- **Performance Approach:**
  - Battery system standard design size based on the equations above.

Nonresidential Battery Storage Sizing – 2025 Proposed Requirements

BESS Capacity Factor B (Wh/ft² of conditioned floor area)

Building Type	CZ1	CZ2	CZ3	CZ4	CZ5	CZ6	CZ7	CZ8	CZ9	CZ10	CZ11	CZ12	CZ13	CZ14	CZ15	CZ16
Events & Exhibits	**1.82**	**1.95**	**1.74**	**2.12**	**1.91**	**2.13**	**2.24**	**2.3**	**2.36**	**2.47**	**2.62**	**2.16**	**2.64**	**2.68**	**3.22**	**1.89**
Library	0.37	7.17	5.97	6.75	5.64	6.08	6.19	7.13	7.18	7.56	7.17	6.93	6.88	6.81	7.93	6.4
Hotel/Motel	0.86	0.84	0.77	0.92	0.81	0.89	0.9	1.01	1	1.11	1.14	0.96	1.18	1.18	1.49	0.85
Office, Financial Institution, Unleased Tenant Space	NR	5.26	4.35	5.26	4.35	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	6.39	4.35
Restaurants	4.36	4.11	3.78	4.37	3.89	4.02	4.11	4.49	4.47	4.82	5.05	4.43	5.05	5.24	6.23	4.11
Retail, Grocery	1.89	1.82	1.71	1.82	1.72	1.8	1.76	1.92	1.97	2.05	2.22	1.95	2.16	2.29	2.66	1.91
School	NR	3.05	2.38	3.05	2.38	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	4.60	2.38
Warehouse	0.37	0.41	0.37	0.41	0.37	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.54	0.37
Religious Worship	**2.21**	**2.25**	**1.74**	**2.42**	**2.08**	**2.75**	**2.94**	**3.37**	**3.17**	**3.37**	**3.58**	**2.72**	**3.62**	**3.21**	**4.89**	**2.37**
Sports & Recreation	**1.26**	**0.98**	**0.76**	**1.14**	**0.86**	**1.2**	**1.23**	**1.57**	**1.53**	**1.65**	**1.83**	**1.27**	**1.57**	**1.57**	**3.02**	**1.13**
Multifamily >3 stories	1.88	2.27	1.88	2.27	1.88	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.85	1.88

Bold indicates new building type; Box indicates updated requirement

JA12 Requirements Nonresidential Buildings

Nonresidential Energy Storage JA12– 2025 Proposed Requirements

Definitions:

- **Battery Energy Storage System (BESS)** is a stationary equipment that receives electrical energy and then utilizes batteries to store that energy for later use to supply electrical energy when needed. The BESS consists of one or more modules, a power conditioning system, and balance of plant components
- **Field-Assembled BESS** is a BESS with a combination of energy storage modules and inverter components that are installed to operate as a system in the field, and the combination has more than one model number.
- **Integrated BESS** is a BESS that contains both energy storage and inverter components and has a single model number.
- **Usable Capacity** is the energy storage capacity in kWh that a manufacturer allows to be used for charging and discharging.

Nonresidential Energy Storage JA12– 2025 Proposed Requirements

JA12.3.1 Safety Requirements:

- Added reference of UL1741 Supplement SB

JA12.3.2 Minimum System Performance Requirement:

- Removed minimum 5 kWh requirement from prescriptive compliance
- Clarify that under performance compliance the minimum 5 kWh requirement is per building, therefore combination of smaller energy storage units can be used

JA12.3.3 General Control Requirements:

- Removed subsection (c) and (d) regarding requirements for twice a year reset and backup behavior

Nonresidential Energy Storage JA12– 2025 Proposed Requirements

JA12.4.5 New Control (Price Optimization Control):

- A new JA12 controls option introduced in addition to basic, TOU, advanced DR.
- The algorithm will be developed with the help of energy storage industry to address the current practices of the commercial battery storage' behavior for charging and discharging for demand charge reduction, load shifting and other purposes.

JA12.6 Interconnection and Net Energy Metering Requirements:

- Section removed

JA12.7 Certification Documentation Requirements

- New section to clearly describe documentation needed for JA12 certification.

Questions/Public Comment Period

Zoom App/Online

- Click “raise hand”

Telephone

- Press *9 to raise hand
- Press *6 to Mute/Unmute

When called upon

- CEC will open your line
- Unmute on your end
- Spell name and state affiliation, if any
- 2 minutes or less per speaker, 1 speaker per entity

Comments on the 2025 Codes

- **Comments on Todays Hearing**
- **Due Date: May 13, 2024, by 5:00 PM**

- **Comments to be submitted to: https://efiling.energy.ca.gov/Ecomment/Ecomment.aspx?docketnumber=24-BSTD-01**

- Thank you for participating!

Thank you for participating in today's hearing!

Comments on Lead Commissioner Hearings

- **Due Date: May 13, 2024, by 5:00 PM**
- **Comments to be submitted to: https://efiling.energy.ca.gov/Ecomment/Ecomment.aspx?docketnumber=24-BSTD-01**
- **Public Assistance with Participation**

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  https://www.energy.ca.gov/about/divisions-and-offices/office-public-advisor