



2025 Energy Code: Nonresidential Significant Changes

California Energy Commission

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Green Technology Green California Summit – Sept 15, 2026



Agenda

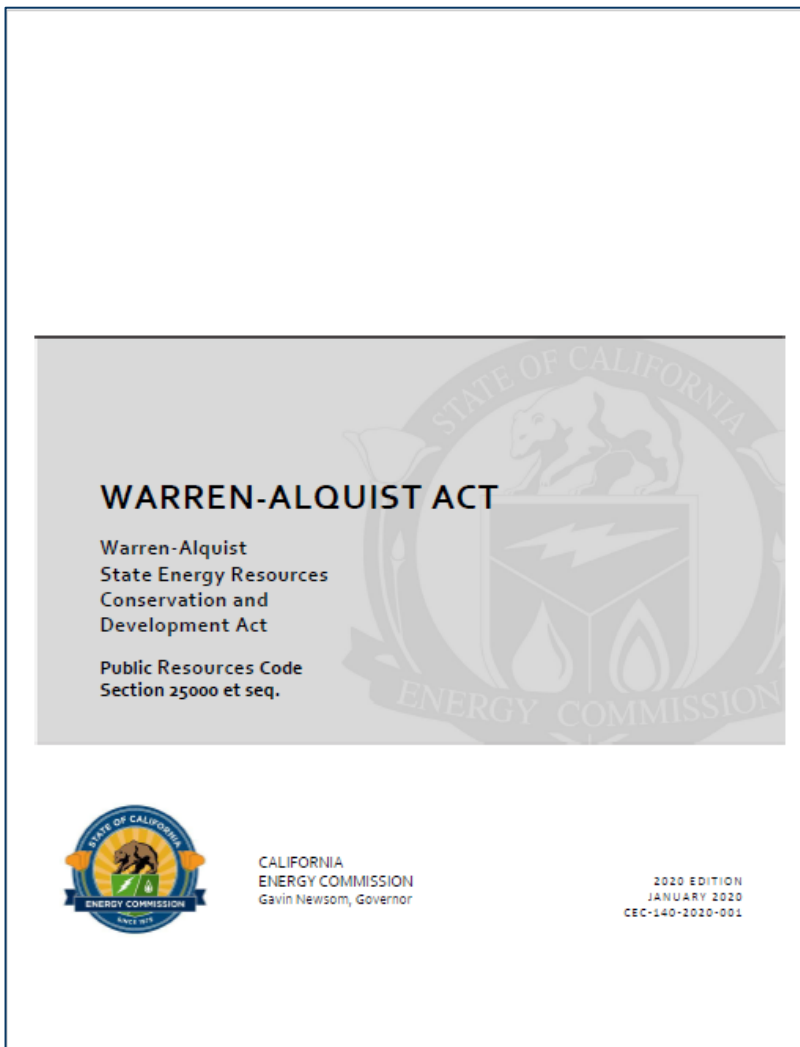
- 2025 Energy Code basics
- Envelope
- Solar PV and battery energy storage system ready
- HVAC
- Water heating, pools and spas
- Lighting
- Resources



2025 Energy Code Basics



Energy Code History



Warren-Alquist Act established CEC in 1974

- Authority to develop and maintain Building Energy Efficiency Standards (Energy Code)
- Requires CEC to update periodically, usually every 3 years
- Requires Energy Code to be cost-effective over economic life of building



2025 Energy Code Goals

State goals

- Contribute to GHG reduction
- Increase building energy efficiency cost-effectively

2025 Energy Code goals

- Increase heat pump baselines
- Promote demand flexibility, solar PV, and battery energy storage systems
- Reduce covered process loads
- Promote equity and affordable housing program
- Focus on existing building and ADUs





2025 Energy Code Benefits by the Numbers

Energy cost savings: \$4.8B

Avoided GHG Emissions: 4.1M MT CO₂e

Benefit to Cost Ratio: 7

Electricity Savings: 392 GWh/yr

Natural Gas Savings: 23 MM Therms/yr

Water Savings: 68+ MM gallons/yr

Heat pumps:

Leads to installation of over 500k heat pumps over 3 years

PV/Battery:

Saves on average 300 GWh/year; reduces power demand on average 0.88MW/year. Minimizes grid exports.

Electric-ready:

Sets up owners of newly constructed commercial kitchens to use cleaner electric equipment when they are ready



2025 Energy Code

The screenshot shows the California Energy Commission website. The header includes the CA.gov logo, social media links, and navigation menus. The main content area features a large banner for the 2025 Building Energy Efficiency Standards, with a description of the code's expansion on heat pumps and electric-readiness. Below the banner, there are sections for Building Energy Efficiency Standards (listing 2022, 2019, and 2028 standards, and submission forms), Proceeding Information (Docket Log and Submit e-Comment), and Contact information (Hotline Submission Form, toll-free and outside California numbers). A sidebar on the left highlights the 2025 Energy Code for Residential and Nonresidential Buildings with a button to view the 2025 Energy Code.

- Energy Code
- Reference Appendices
- Compliance Manuals
- Software
- Forms
- Restructured Code





Energy Code Requirements

Mandatory requirements

- Minimum efficiency requirements must always be met
- Can never trade off

Prescriptive requirements

- Predefined efficiency requirements
- May supersede mandatory requirements
- Different requirements for newly constructed buildings, additions, and alterations



Compliance Approaches

Prescriptive approach

- Simple approach, no trade-offs
- Defines the standard building design
- 2022 heat pump baselines

Performance approach

- Most flexible approach, allows for trade-offs
- Must meet all mandatory requirements
- Requires the use of CEC-approved software
- Proposed building design meets or exceed standard building design





2025 Compliance Software

- Performance approach must use approved compliance software versions
- Single-family
 - CBECC 2025.2.0, 2.1, 2.1.1
 - Energy Pro 10.0, 10.1
 - Right-Energy Title 24 Version 2025.2.0
- Nonresidential and multifamily
 - CBECC 2025.2.0, 2.1, 2.1.1
 - Energy Pro 10.0, 10.1
 - IES VE Title 24 2025.1.0



2025 Envelope Changes Nonresidential



Fenestration Mandatory Requirements

Nonresidential § 120.7(d)

New for 2025

Exterior windows

- Vertical fenestration area-weighted average maximum U- factor 0.47
- Exception: Buildings meeting CBC Part 7, California Wildland-Urban Interface (WUI) Code, and located in Fire Hazard Severity Zones or WUI Fire Areas as designated by local enforcement agency



Fenestration – Vestibules Mandatory Requirements

Nonresidential § 120.7(e)

Vestibules – newly constructed buildings

New for 2025

- Public entrances in occupancy groups A, B, E, I, M
- All doors opening into and out of vestibule equipped with self-closing devices
 - Design so that interior and exterior doors not open at same time
 - Required on main entrance doors adjacent to revolving doors in building entrance
- If conditioned – heating system and air curtains with integral heating must have controls to shut off heating when outdoor air is above 45°F
 - Heating and cooling systems controlled by thermostat located in vestibule to limit heating to maximum 60°F and cooling to minimum 85°F





Fenestration - Vestibules Mandatory Requirements

Nonresidential § 120.7(e)

New for 2025

Vestibule exceptions

- Doors not intended to be used by public
- Doors opening directly from sleeping unit or dwelling unit
- Doors that open directly from space less than 3,000 square feet
- Revolving doors installed where public entrance to newly constructed building is required
- Doors primarily for vehicular movement or material handling and adjacent personnel doors
- Doors with air curtain velocity of at least 6.56 feet per second at floor per ANSI/AMCA 220
- Public entrances in buildings in Climate Zones 2 through 13
 - Less than four stories above grade and less than 10,000 square feet CFA
- Buildings with building plans submitted to local planning department prior to January 1, 2026



Fenestration Alterations Mandatory Requirements

Nonresidential § 141.0(b)1E

New for 2025

Replacing existing fenestration over 150 square feet

- Vertical windows
 - Maximum U-factor 0.58

Additional fenestration over 50 square feet

- Vertical windows
 - Meet § 120.7(d) maximum U- factor 0.47



Updated for 2025

- TABLE 140.3-B Roof and Ceiling Insulation Maximum U-Factors for Nonresidential Buildings**

TABLE 140.3-C Roof and Ceiling Insulation Maximum U-Factors for Guest Rooms of Hotel or Motel Buildings

[illegible]



Wall Insulation Prescriptive Requirements

Nonresidential § 140.3(a)2, Tables 140.3-B

Updated for 2025

- Wall maximum U-factors for nonresidential buildings
 - Varies by Climate Zone
 - R-values in Reference Joint Appendix JA4 Tables

TABLE 140.3-B Wall Insulation Maximum U-Factors for Nonresidential Buildings

Climate Zone	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Metal Building	0.098	0.053	0.098	0.053	0.053	0.098	0.098	0.053	0.053	0.053	0.053	0.053	0.053	0.053	0.050	0.053
Metal-framed	0.060	0.055	0.071	0.055	0.055	0.060	0.060	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055
Mass Light ¹	0.170	0.138	0.227	0.196	0.364	0.364	0.364	0.364	0.364	0.138	0.138	0.138	0.138	0.138	0.138	0.138
Mass Heavy ¹	0.211	0.650	0.650	0.650	0.650	0.690	0.690	0.690	0.690	0.650	0.160	0.211	0.184	0.160	0.160	0.153
Wood-framed and Other	0.078	0.053	0.102	0.053	0.095	0.102	0.102	0.095	0.053	0.053	0.042	0.053	0.053	0.053	0.038	0.053



2025 Solar Photovoltaic (PV) & Battery Energy Storage System (BESS) Changes



Solar PV Prescriptive Requirements

Nonresidential § 140.10(a)

Updated for 2025

- Newly constructed building types specified in Table 140.10-A
 - Newly installed PV system meets JA11
 - Mixed occupancy buildings where at least 80% of the floor area of the building serves one or more of these building types
- Minimum PV system capacity (kWdc) = whichever is smaller
 - Equation 140.10-A
 - Total of all available solar access roof areas (SARA)
 - SARA x 18 Watts per square feet for steep slope roofs
 - SARA x 14 Watts per square feet for low slope roofs
- Mixed occupancy buildings
 - Minimum rated PV system capacity
 - Apply Equation 140.10-A to CFA of each listed building type and sum capacities



Solar PV Prescriptive Requirements

Nonresidential § 140.10(a)2

Updated for 2025

- SARA excludes roof area(s)
 - Less than 70% annual solar access
 - $$\text{Annual solar access} = \frac{[\text{annual solar insolation, minus shading from obstructions}]}{[\text{annual solar insolation if unshaded}]}$$
 - Shading from all obstructions counted in SARA calculations
 - Occupied per CBC § 503.1.4
 - Roof area otherwise unavailable
 - Other state building code requirements
 - Local building code requirements confirmed by Executive Director



Updated for 2025

[illegible]



Solar PV Prescriptive Requirements

Nonresidential, Exception 5 to § 140.10(a)

Updated for 2025

Exception for multitenant buildings

- PV capacity to be calculated excluding tenant spaces
 - 2,000 square feet or less of condition floor space
 - Individual HVAC system
 - Individual utility meter
 - Does not apply:
 - CEC approved community solar program per § 10-115
 - Load-serving entity program compensates PV generation through virtual energy bill credits for occupants from netting of energy generation and consumption



Non-BESS Buildings § 140.10 Requirements

Updated for 2025

- All buildings with PV system per § 140.10(a) must have battery energy storage system (BESS) meeting JA12
- Minimum rated energy capacity determined by
 - Equation 140.10-B
 - Equation 140.10-C if SARA was used
 - Mixed occupancy to determine total battery system capacity by applying minimum rated energy capacity to each listed building type and summing
 - Minimum rated power capacity determined by Equation 140.10-D



BESS Prescriptive Requirements

Nonresidential § 140.10(b), Equations 140.10-B and -C

Updated for 2025

Equation 140.10-B

$$kWh_{batt} = \frac{CFA \times B}{1000 \times C^{0.5}}$$

Equation 140.10-C

$$kWh_{batt} = \frac{CFA \times B}{1000 \times C^{0.5}} \times \frac{kW_{PVdc \text{ SARA}}}{kW_{PVdc}}$$

- kWh_{batt} = Minimum Rated Usable Energy Capacity (kWh)
- kW_{PVdc} = Minimum Rated PV System Capacity, Equation 140.10-A (kW)
- $kW_{PVdc, SARA}$ = Minimum Rated PV System Capacity, SARA calculation (kW)
- CFA = Conditioned floor area subject to § 140.10(a) (square feet)
- B = BESS Capacity Factor, Table 140.10-B (Wh/square feet)
- C = Rated single charge-discharge cycle AC-to-AC (round-trip) efficiency of BESS
 - Value under 1
 - From manufacturer specifications



BESS Prescriptive Requirements

Nonresidential § 140.10(b), Equation 140.10-D

Updated for 2025

Equation 140.10-D for minimum power capacity

$$kW_{batt} = kWh_{batt}/4$$

- kW_{batt} = Minimum rated power capacity of BESS (kWdc)
- kWh_{batt} = Minimum rated usable energy capacity of BESS (kWh)



BESS Prescriptive Requirements

Nonresidential § 140.10(b), Table 140.10-B

Updated for 2025

Table 140.10-B –BESS Capacity Factors (watt-hours per square foot of conditioned floor area)

Building Type	CZ 1	CZ 2	CZ 3	CZ 4	CZ 5	CZ 6	CZ 7	CZ 8	CZ 9	CZ 10	CZ 11	CZ 12	CZ 13	CZ 14	CZ 15	CZ 16
Events & Exhibits	1.82	1.95	1.74	2.12	1.91	2.13	2.24	2.30	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	6.40
Hotel/Motel	0.86	0.84	0.77	0.92	0.81	0.89	0.90	1.01	1.00	1.11	1.14	0.96	1.18	1.18	1.49	0.85
Office, Financial Institution, Unleased Tenant Space, Medical Office Building/Clinic	NR ¹	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	1.80	1.76	1.92	1.97	2.05	2.22	1.95	2.16	2.29	2.66	1.91
School	NR ¹	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	NR ¹	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	1.20	1.23	1.57	1.53	1.65	1.83	1.27	1.86	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

Footnote to TABLE 140.10-B:

1. NR = Not Required



Solar Equipment Lists

Batteries

List of batteries approved per JA12

Updated for 2025

Batteries					
Manufacturers: All Model Names: All Search Rows: 25 Download Excel file					
Note #1: The Battery List only includes electrochemical batteries. Note #2: "JA12" references the 2022 or 2025 Building Energy Efficiency Standards' Reference Joint Appendix 12 (JA12). This appendix outlines requirements for field assembled battery energy storage systems to qualify for the compliance credit or the prescriptive requirements of the battery energy storage system as required. Y (2022) corresponds to batteries that comply with JA12 requirements of the energy code cycle 2022 and before, and Y (2025) corresponds to batteries that comply with JA12 requirements of the energy code cycle 2025 and before. For more information, see the link. Note #3: Maximum continuous discharge rate as stated by the manufacturer on the spec sheet.					
Manufacturer	Model Name	Description	Nameplate Energy Capacity Rate (kW)	Max Continuous Discharge Rate(kW)	Declaration for JA12 Submitted
Yotta Energy, Inc.	SL-1000	675 W, 1 kWh lithium iron phosphate battery	1	0.675	Y (2022)
SolarEdge Technologies Ltd.	BAT-10K1P	5 kW, 9.7 kWh lithium ion battery system	9.7	5	Y (2022)
Jinko Solar Co., Ltd	JKR-B1950-A-US	17.28 kW, 19.2 kWh, lithium-ion battery	19.2	17.28	Y (2022)
Fortress Power LLC	eVaultMax	9.2 kW, 18.5 kWh, lithium iron phosphate battery	18.43	9.2	Y (2022)
Fortress Power LLC	eFlex 5.4	5 kW, 5.4 kWh, lithium iron phosphate battery	5	5.4	Y (2022)
Energizer Solar	PSUS4000H-7	20.16 kW, 27.82 kWh Lithium Ion (LFP) Battery Storage System	27.82	20.16	Y (2022)
Energizer Solar	PSUS4000H-6	17.28 kW, 23.85 kWh Lithium Ion (LFP) Battery Storage System	23.85	17.28	Y (2022)
Energizer Solar	PSUS4000H-5	14.4 kW, 19.87 kWh Lithium Ion (LFP) Battery Storage System	19.87	14.4	Y (2022)
Energizer Solar	PSUS4000H-4	11.52 kW, 15.90 kWh Lithium Ion (LFP) Battery Storage System	15.9	11.52	Y (2022)
Energizer Solar	PSUS4000H-3	8.64 kW, 11.92 kWh Lithium Ion (LFP) Battery Storage System	11.92	8.64	Y (2022)
Energizer Solar	PSUS4000H-2	5.76 kW, 7.95 kWh Lithium Ion (LFP) Battery Storage System	7.95	5.76	Y (2022)
BSL New Energy Technology Co., Ltd.	B-LFP48-100E	5.12 kW, 5.12 kWh lithium iron battery	5.12	5.12	Y (2022)
Zhuhai Ruixu Electronic Technology CO., LTD	Lithi2-16	10.24 KW, 16kWh, lithium iron phosphate battery	16	10.24	N
Zhuhai Ruixu Electronic Technology CO., LTD	RX-LFP48100-H	5.12 KW, 5.12kWh, lithium iron phosphate battery	5.12	5.12	N
Zhuhai Ruixu Electronic Technology CO., LTD	RX-LFP48100	5.12 KW, 5.12kWh, lithium iron phosphate battery	5.12	5.12	N
Xiamen Kehua Digital Energy Tech Co., Ltd	iStorageE BSL-S1	2.5 kW, 5 kWh lithium iron phosphate battery	5	2.5	N
Xiamen Hithium Energy Storage Technology Co., Ltd.	LC083502	418 kW, 836 kWh lithium iron phosphate battery	836	418	N
Xiamen Hithium Energy Storage Technology Co., Ltd.	SL00344U001L	172 kW, 344 kWh lithium iron phosphate battery	344	172	N
Xiamen Hithium Energy Storage Technology Co., Ltd.	CL00344U001L	172 kW, 344 kWh lithium iron phosphate battery	344	172	N
Xiamen Ampace Technology Limited	C-M51200ESA1	5.12 kW, 10 kWh lithium iron battery	10.03	5.12	N
Ulectric Technology Co., Ltd	Camel HSS-20	10 kW, 20 kWh, lithium ion battery	20	10	N
Ulectric Technology Co., Ltd	Camel HESS-15	10 kW, 15 kWh, lithium ion battery	15	10	N
Ulectric Technology Co., Ltd	Camel HESS-10	9 kW, 10 kWh, lithium ion battery	10	9	N
Ulectric Technology Co., Ltd	Camel HESS-5	5 kW, 5 kWh, lithium ion battery	5	5	N
TWS Technology (Anhui) Limited	ProeM-372-1h	372 kW, 372 kWh Lithium Iron Phosphate (LFP) Battery Storage System	372	372	N



Solar Equipment Lists

Energy Storage Systems

List of Approved Energy Storage Systems

Updated for 2025

Energy Storage Systems

Manufacturers: All

Model Names: All

Search

Rows 25

Download Excel file

Note #1: The Energy Storage System List only includes battery energy storage systems.

Note #2: Energy storage systems on the list may incorporate a grid support inverter as a component. Grid support inverters are inverters that include advanced functionality and communication abilities and are commonly known as “smart inverters”. Note that the equipment on the Energy Storage System List is capable of different levels of advanced functionality. It is important that you verify with the applicable utility, AHJ, or responsible entity whether specific equipment contains the level of functionality required by their “smart inverter” definition. Information about advanced inverter functionalities can be viewed by exporting the list.

Note #3: “JA12” references the 2022 or 2025 Building Energy Efficiency Standards’ Reference Joint Appendix 12 (JA12). This appendix outlines requirements for integrated battery energy storage systems to qualify for the compliance credit or the prescriptive requirements of the battery energy storage system as required. Y (2022) corresponds to battery energy storage systems that comply with JA12 requirements of the energy code cycle 2022 and before, and Y (2025) corresponds to battery energy storage systems that comply with JA12 requirements of the energy code cycle 2025 and before. For more information, see the [link](#).

Manufacturer	Model Number	Description	PV DC Input Capability	Nameplate Energy Capacity (kWh)	Nameplate Power (kW)	Nominal Voltage (Vac)	Declaration for JA12 Submitted
Yotta Energy, Inc.	SL-1000/DPI-480	0.45 kW, 1 kWh, lithium iron phosphate energy storage system	Y	1	0.45	480	Y (2022)
Yotta Energy, Inc.	SL-1000/DPI-208	0.432 kW, 1 kWh, lithium iron phosphate energy storage system	Y	1	0.432	208	Y (2022)
Villara Energy Systems, LLC	VES20BC22S10P-S8K	8 kW, 11.5 kWh, LTO energy storage system	N	11.5	8	240	Y (2022)
Villara Energy Systems, LLC	VES20BC22S10P-S12K	8 kW, 11.5 kWh, LTO energy storage system	N	11.5	8	240	Y (2022)
Villara Energy Systems, LLC	VES20BC22S5P-S8K	8 kW, 5.75 kWh, LTO energy storage system	N	5.75	8	240	Y (2022)
Villara Energy Systems, LLC	VES20BC22S5P-S12K	8 kW, 5.75 kWh, LTO energy storage system	N	5.75	8	240	Y (2022)
Tesla Inc.	AC Powerwall 3012170-XX-Y	5 kW, 13.5 kWh, 240 Vac Lithium-Ion Energy Storage System, where xx are numbers and y is a letter; capable of PCS functionality	N	13.5	5	240	Y (2022)
Tesla Inc.	AC Powerwall 2012170-XX-Y	5 kW, 13.5 kWh, 240 Vac Lithium-Ion Energy Storage System, where xx are numbers and y is a letter; capable of PCS functionality	N	13.5	5	240	Y (2022)
Tesla Inc.	18S0000-XX-Y	7.6 kW, 13.5 kWh, 240 Vac split phase, Lithium-Ion Energy Storage System capable of PCS functionality; 9.6 kW off-grid. The PV inverter 1538000-XX-Y is a component of this system.	Y	13.5	7.6	240	Y (2022)
Tesla Inc.	1707000-XX-Y [7.6kW]	7.6 kW, 13.5 kWh, 240 Vac split phase, Lithium-Ion Energy Storage System (Powerwall 3), where XX are numbers and Y is a letter.	Y	13.5	7.6	240	Y (2022)
Tesla Inc.	1707000-XX-Y [5.75kW]	5.75 kW, 13.5 kWh, 240 Vac split phase, Lithium-Ion Energy Storage System (Powerwall 3), where XX are numbers and Y is a letter.	Y	13.5	5.75	240	Y (2022)
Tesla Inc.	1707000-XX-Y [11.5kW]	11.5 kW, 13.5 kWh, 240 Vac split phase, Lithium-Ion Energy Storage System (Powerwall 3), where XX are numbers and Y is a letter. Capable of PCS functionality.	Y	13.5	11.5	240	Y (2022)
Tesla Inc.	1707000-XX-Y [10kW]	10 kW, 13.5 kWh, 240 Vac split phase, Lithium-Ion Energy Storage System (Powerwall 3), where XX are numbers and Y is a letter.	Y	13.5	10	240	Y (2022)
SunPower	SV-BASE19.5-C	6kW, 19.5kWh, 240 Vac lithium iron phosphate energy storage system with PCS functionality	N	19.5	6	240	Y (2022)



- ## Updated for 2025

[illegible]



2025 Indoor Air Quality and Ventilation Changes Nonresidential



Ventilation & Indoor Air Quality (IAQ) Mandatory Requirements

All buildings § 120.1(c)1

Updated for 2025

Air filtration

- Required for:
 - Mechanical space-conditioning systems with ductwork longer than 10 feet
 - Mechanical supply-only ventilation systems and makeup air systems that provide outside air to an occupiable space
 - Supply side of mechanical balanced ventilation systems, including:
 - Heat recovery ventilation (HRV) systems
 - Energy recovery ventilation (ERV) systems
- Adds exception
 - Evaporative coolers



Ventilation & IAQ Mandatory Requirements

Nonresidential § 120.1(c)3

Updated for 2025

Mechanical ventilation

- Outdoor ventilation rate determined by Equation 120.1-F

$$V_z = \text{the larger of } R_p \times P_z \text{ or } R_a \times A_z$$

Where:

- V_z = Required outdoor airflow rate (cfm)
- R_p = 15 cubic feet per minute of outdoor airflow per person
- P_z = Expected number of occupants
- R_a = Area-based minimum ventilation airflow rate in Table 120.1-A
- A_z = Net occupiable floor area of the ventilation zone in square feet



Ventilation & IAQ Mandatory Requirements

Nonresidential Table 120.1-B

Updated for 2025

- Adds categories for minimum exhaust rates to Table 120.1-B

Table 120.1-B – Minimum Exhaust Rates [ASHRAE 62.1: Table 6.-25]

Occupancy Category	Exhaust Rate (cubic feet per minute per unit)	Exhaust Rate (cubic feet per minute per square foot)	Air Class	Notes
<u>Animal imaging(MRI/CT/PET)</u>	-	<u>0.9</u>	3	-
<u>Animal operating rooms</u>	-	<u>3.00</u>	3	-
<u>Animal postoperative recovery room</u>	-	<u>1.5</u>	3	-
<u>Animal preparation rooms</u>	-	<u>1.5</u>	3	-
<u>Animal procedure room</u>	-	<u>2.25</u>	3	-
<u>Animal surgery scrub</u>	-	<u>1.50</u>	3	-
<u>Large-animal holding room</u>	-	<u>2.25</u>	3	-
<u>Animal Necropsy</u>	-	<u>2.25</u>	3	-
<u>Small-animal-cage room (static cages)</u>	-	<u>2.25</u>	3	-
<u>Small-animal-cage room (ventilated cages)</u>	-	<u>1.50</u>	3	-



Ventilation & IAQ Mandatory Requirements

Nonresidential Table 120.1-C

Updated for 2025

- Updates Table 120.1-C to align with ASHRAE 62.1

Table 120.1-C – Airstreams or Sources [ASHRAE 62.1:Table 5.16.16-3]

Description	Air Class
Commercial kitchen grease hoods	4
Commercial kitchen hoods other than grease	3
Diazo printing equipment discharge	4
Hydraulic elevator machine room	2
Laboratory hoods	4
<u>Paint spray booths</u>	<u>4</u>
<u>Refrigerating machinery rooms</u>	<u>3</u>



2025 HVAC Changes Nonresidential



Space-Conditioning Equipment Mandatory Requirements

All buildings § 110.2(e)

Updated for 2025

Open and closed-circuit cooling towers

- All cooling towers 150 tons or more must have conductivity controls
- Maximum achievable cycles of concentration per Table 110.2-A-1 and based on local water supply quality.
 - Documented on NRCC-MCH-E Table M
 - Signed by Professional Engineer (PE)
- Blowdown not allowed until one or more parameters reach maximum value in Table 110.2-A-1
- Conductivity controls and overflow alarm verified per NA 7.5.18



Space-Conditioning Equipment Mandatory Requirements

All buildings Table 110.2-A-1

New for 2025

<u>Recirculating Water Parameters</u>	<u>Maximum Values</u>
<u>Conductivity (micro-siemens/cm)</u>	<u>2970 micro-siemens/cm</u>
<u>Total dissolved solids (ppm)</u>	<u>1845 ppm</u>
<u>Total alkalinity as CaCO₃ (ppm) excluding galvanized steel</u>	<u>540 ppm</u>
<u>Total alkalinity as CaCO₃ (ppm) galvanized steel (passivated)</u>	<u>450 ppm</u>
<u>Calcium hardness as CaCO₃ (ppm)</u>	<u>540 ppm</u>
<u>Chlorides as Cl (ppm)</u>	<u>270 ppm</u>
<u>Sulfates (ppm)</u>	<u>225 ppm</u>
<u>Silica (ppm)</u>	<u>135 ppm</u>
<u>Langelier saturation index (LSI)</u>	<u>2.5 (LSI)</u>



Space-Conditioning Equipment Mandatory Requirements

All buildings § 110.2

Updated for 2025

Removes Tables with federal minimum values

- Table 110.2-E – Packaged Terminal Air Conditioners and Packaged Terminal Heat Pumps Minimum Efficiency Requirements
- Table 110.2-I - Warm-Air Furnaces and Combination Warm-Air Furnaces/Air-Conditioning Units, Warm-Air Duct Furnaces, and Unit Heaters
- Table 110.2-J - Gas- and Oil-Fired Boilers, Minimum Efficiency Requirements
- Table 110.2-L - Floor-Mounted Air Conditioners and Condensing Units Serving Computer Rooms – Minimum Efficiency Requirements
- Table 110.2-M - Ceiling-Mounted Air Conditioners and Condensing Units Serving Computer Rooms – Minimum Efficiency Requirements



Space-Conditioning Equipment Mandatory Requirements

All buildings § 110.2

New for 2025

Adds Tables

- Table 110.2-J – Heat Pump and Heat Recovery Chiller Packages, Heat Pump, Heating Operation – Minimum Efficiency Requirements
- Table 110.2-K - Heat Pump and Heat Recovery Chiller Packages, Simultaneous Cooling and Heating, Heating Operation– Minimum Efficiency Requirements
- Table 110.2-L - Heat Pump and Heat Recovery Chiller Packages, Heat Recovery, Heating Operation– Minimum Efficiency Requirements



Demand Management Mandatory Requirements

All buildings § 110.12(a)1

Updated for 2025

Demand responsive controls

- When meeting demand management requirements, thermostats meet JA5 requirements, if no EMCS
- Spelled out communication protocols either
 - Must be certified as Open ADR 2.0a or b Virtual End Node (VEN)
 - Must be capable of responding to open ADR 2.0b VEN
 - Must be Open ADR 3.0 Virtual End Node



Space-Conditioning System Controls Mandatory Requirements

Nonresidential § 120.2(l)

New for 2025

HVAC hot water temperature

- Hot water supply temperature no greater than 130°F in zones that use hot water for space heating



Pipe Insulation Mandatory Requirements

Nonresidential § 120.3(a)

Updated for 2025

- Pipe insulation required
 - Space cooling refrigerant suction, chilled water, and brine lines
 - Space heating refrigerant suction, steam, steam condensate, and hot water lines
 - Process heating refrigerant suction, steam, steam condensate, and hot water fluid distribution systems for heating a process unrelated to space conditioning
 - Process cooling refrigerant suction, chilled water, and brine fluid distribution systems for cooling unrelated to space conditioning
- Exception
 - No insulation required on refrigerant liquid line



Pipe Insulation Mandatory Requirements

Nonresidential § 120.3(c)

Updated for 2025

Insulation thickness

- Insulation thickness levels specified in Table 120.3-A1 or A2
- If the conductivity is outside the range listed in Table 120.3-A1 or A2 calculation method from §120.3(c)2 must be used

$$T = PR \left[\left(1 + \frac{t}{PR} \right)^{\frac{K}{k}} - 1 \right]$$

T = insulation thickness

PR = actual outside radius

t = insulation thickness from Table 120.3-A1 or A2

K = conductivity of alternate material from Table 120.3-A1 or A2

k = lower value of the conductivity range from Table 120.3-A1 or A2



Pipe Insulation Mandatory Requirements

Nonresidential § 120.3(c), Table 120.3-A1

Updated for 2025

- Table 120.3-A1 pipe insulation thickness for heating

Fluid Operating Temperature Range (°F)	Insulation Conductivity (in Btu·in/h·ft²·°F)	Insulation Mean Rating Temperature (°F)	Nominal Pipe Diameter < 1 inch	Nominal Pipe Diameter 1 to < 1.5 inches	Nominal Pipe Diameter 1.5 to < 4 inches	Nominal Pipe Diameter 4 to < 8 inches	Nominal Pipe Diameter 8 inches and larger
Above 350	0.32-0.34	250	4.5 inches	5.0 inches	5.0 inches	5.0 inches	5.0 inches
Above 350	0.32-0.34	250	R 37	R 41	R 37	R 27	R 23
251-350	0.29-0.32	200	3.0 inches	4.0 inches	4.5 inches	4.5 inches	4.5 inches
251-350	0.29-0.32	200	R 24	R 34	R 35	R 26	R 22
201-250	0.27-0.30	150	2.5 inches	2.5 inches	2.5 inches	3.0 inches	3.0 inches
201-250	0.27-0.30	150	R 21	R 20	R 17.5	R 17	R 14.5
141-200	0.25-0.29	125	1.5 inches	1.5 inches	2.0 inches	2.0 inches	2.0 inches
141-200	0.25-0.29	125	R 11.5	R 11	R 14	R 11	R 10
105-140	0.22-0.28	100	1.0 inch	1.5 inches	1.5 inches	1.5 inches	1.5 inches
105-140	0.22-0.28	100	R 7.7	R 12.5	R 11	R 9	R 8



Pipe Insulation Mandatory Requirements

Nonresidential § 120.3(c), Table 120.3-A2

Updated for 2025

- Table 120.3-A2 pipe insulation thickness for cooling

Fluid Operating Temperature Range (°F)	Insulation Conductivity (in Btu·in/h·ft²·°F)	Insulation Mean Rating Temperature (°F)	Nominal Pipe Diameter < 1 inch	Nominal Pipe Diameter 1 to < 1.5 inches	Nominal Pipe Diameter 1.5 to < 4 inches	Nominal Pipe Diameter 4 to < 8 inches	Nominal Pipe Diameter 8 inches and larger
Residential 40-60	0.21-0.27	75	0.75 inch	0.75 inch	1.0 inch	1.0 inch	1.0 inch
Residential 40-60	0.21-0.27	75	R 6	R 5	R 7	R 6	R 5
Nonresidential 40-60	0.21-0.27	75	0.5 inch	0.5 inch	1.0 inch	1.0 inch	1.0 inch
Nonresidential 40-60	0.21-0.27	75	R 3	R 3	R 7	R 6	R 5
Below 40	0.20-0.26	50	1.0 inch	1.5 inches	1.5 inches	1.5 inches	1.5 inches
Below 40	0.20-0.26	50	R 8.5	R 14	R 12	R 10	R 9



Pipe Insulation Mandatory Requirements

Nonresidential § 120.3

Updated for 2025

Exceptions

- Factory-installed piping within space-conditioning equipment certified under § 110.1 or § 110.2
- Piping with design operating temperature range between 60°F and 105°F
- Where heat gain or heat loss to or from piping without insulation will not increase building source energy use
- Piping that penetrates framing members not required to have pipe insulation for distance of framing penetration
 - Metal piping that penetrates metal framing must have grommets, plugs, wrapping, or other insulation to prevent contact with metal framing
- Fluid pumps, steam traps, blow-off valves, and piping within process equipment
- Valves, strainers, coil u-bends, air separators with at least 0.5 inches of insulation, and piping within process equipment



Ducts and Plenums Mandatory Requirements

Nonresidential § 120.4(g)

Updated for 2025

Duct sealing - either

- Leakage rate less than 6% of nominal air handler airflow rate for new ducts systems confirmed by acceptance testing
 - Does not serve healthcare facility
 - Provides conditioned air to an occupiable space for constant volume, single zone, and space conditioning system
 - Serves single zone less than 5,000 square feet of conditioned floor area
 - Ducts outdoors or unconditioned space combined surface area more than 25% of entire duct system
- Meet testing requirements per CMC §603.10.1



Mechanical System Acceptance Mandatory Requirements

Nonresidential § 120.5(a-b)

Updated for 2025

Equipment/System	Reference Nonresidential Appendix
Outdoor air ventilation	NA7.5.1
Constant volume, single zone air conditioning and heat pump unit controls	NA7.5.2
Duct systems	NA7.5.3
Air economizers, <u>DOAS</u> , HRV or ERV systems (added new exception)	NA7.5.4
Demand control ventilation	NA7.5.5
Supply fan variable flow control	NA7.5.6
Hydronic system variable flow controls	NA7.5.7 & NA7.5.9
Boiler or Chiller with isolation controls	NA7.5.7



Mechanical System Acceptance Mandatory Requirements

Nonresidential § 120.5(a-b)

Updated for 2025

Equipment/System	Reference Nonresidential Appendix
Hydronic systems with supply water temperature reset controls	NA7.5.8
Automatic demand shed controls	NA7.5.10
FDD for packaged DX units	NA7.5.11
Automatic FDD for air handling units	NA7.5.12
Distributed energy storage DX ac systems	NA7.5.13
Thermal Energy storage (TES)	NA7.5.14
Supply air temperature reset controls	NA7.5.15
Water-cooled chillers served by cooling towers with condenser water reset controls	NA7.5.16
Occupant sensing zone controls	NA7.5.17
<u>Conductivity controls and overflow alarms for open and closed cooling towers</u>	<u>NA 7.5.18</u>



Space Conditioning Systems Prescriptive Requirements

Nonresidential § 140.4(a)3

New for 2025

Sizing, equipment selection, and type

- Multi-zone space-conditioning system types
 - Space conditioning systems in office and school buildings not covered by § 140.4(a)2 must meet § 140.4(a)3
 - Exception
 - Buildings greater than 150,000 square feet or more than 5 habitable stories
 - School buildings in Climate Zones 6 and 7



Space Conditioning Systems Prescriptive Requirements

Nonresidential § 140.4(a)3Ai-ii

New for 2025

Multi-zone space-conditioning system types in offices and schools

- Space conditioning must meet one (i-v)
 - VRF heat pump system that incorporates refrigerant loop heat recovery
 - All zones ventilated by dedicated outdoor air system (DOAS)
 - Indoor fans must meet § 140.4(a)3D
 - DOAS must comply with § 140.4(a)3E
 - Four-pipe fan coil (FPFC) terminal units with DOAS providing ventilation to all zones
 - FPFC coils supplied by air to water heat pump (AWHP)
 - Indoor fans meet § 140.4(a)3D
 - DOAS meet § 140.4(a)3E



Space Conditioning Systems Prescriptive Requirements

Nonresidential § 140.4(a)3Aiii

New for 2025

Multi-zone space-conditioning system types in offices

- Space conditioning must meet one (i-v)
 - Space conditioning systems for office buildings in all Climate Zones must be variable air volume (VAV) system that utilizes heating supplied by hot water loop served by AWHP which meets § 140.4(a)3C and
 - For office buildings
 - Portion of perimeter zone terminal unit heating capacity utilizing parallel fan-powered boxes per § 140.4(a)3E must be 100% in Climate Zones 1-6, 16 and 25% in Climate Zones 7-15
 - Ventilation system in Climate Zones 1, 3, 5 must have heat recovery system per § 140.4(q)
 - Maximum allowed fan power in Climate Zones 3 and 5 must be 15% lower than specified in § 140.4(c)1



Space Conditioning Systems Prescriptive Requirements

Nonresidential § 140.4(a)3Aiiib

New for 2025

Multi-zone space-conditioning system types in schools

- Space conditioning must meet one (i-v)
 - Space conditioning systems for schools in Climate Zones 2, 4, and 8-16 must be variable air volume (VAV) system which utilizes heating supplied by hot water loop served by AWHF that meets § 140.4(a)3C and
 - For school buildings
 - All perimeter zone terminal units meet § 140.4(a)3E
 - Ventilation system in Climate Zones 2, 4, and 11-16 have heat recovery system per § 140.4(q)
 - Maximum allowed fan power in Climate Zone 2 must be 15% lower than specified in § 140.4(c)1
 - Design leaving water temperature of heating loop no greater than 120°F in Climate Zone 2



Space Conditioning Systems Prescriptive Requirements

Nonresidential § 140.4(a)3Aiv

New for 2025

Multi-zone space-conditioning system types in offices and schools

- Space conditioning must meet one (i-v)
 - Space conditioning systems must be a dual fan dual duct (DFDD) system with hot and cold decks served by separate fan systems and
 - Economizer must be in cold deck when required by § 140.4(e)
 - Hot deck must supply 100% return air
 - Outdoor air may be supplied as required to supplement cold deck to maintain design minimum outdoor air rate
 - Hot deck heating must be heat pump
 - DFDD and terminal unit control sequence meet ASHRAE Guideline G36



Space Conditioning Systems Prescriptive Requirements

Nonresidential § 140.4(a)3Av

New for 2025

Multi-zone space-conditioning system types in offices and schools

- Space conditioning must meet one (i-v)
 - Space conditioning system determined by Executive Director to use no more energy than systems specified in § 140.4(a)3



Space Conditioning Systems Prescriptive Requirements

Nonresidential § 140.4(a)3C

Updated for 2025

Multi-zone space-conditioning system types

- Air to water heat pump (AWHP) space-heating hot water loop
 - AWHP used for space-heating hot water meeting § 140.4(a)3Aii or iii, or § 140.4(a)3B
 - Efficiency per Table 110.2-J
 - If AWHP is used for space cooling
 - Heat recovery system meet § 140.4(s)
 - Supplemental heat be provided by electric resistance boiler with capacity of maximum 50% of design space-heating hot water loop heating capacity



Space Conditioning Systems Prescriptive Requirements

Nonresidential § 140.4(a)3D

Updated for 2025

Multi-zone space-conditioning system types

- Indoor fans meeting § 140.4(a)3Ai or ii
 - Maximum fan power of 0.35 Watts per cfm at design airflow
 - Minimum of three speeds
 - Turn off when there is no demand of cooling or heating in space



Space Conditioning Systems Prescriptive Requirements

Nonresidential § 140.4(a)3E

Updated for 2025

Multi-zone space-conditioning system types

- DOAS meeting § 140.4(a)3Ai or ii
 - Meet § 140.4(p)
 - Equipped with heat recovery system meeting § 140.4(q)
 - Maximum fan power of 0.77 Watts per cfm at design airflow
- DOAS units that provide active heating or cooling meet either
 - For hydronic heating or cooling
 - DOAS heating coils must be hydronic heating coils utilizing AWHP space-heating hot water loop
 - DOAS cooling coils must be hydronic cooling coils utilizing space-cooling chilled water loop
 - Other heating or cooling must be heat pump
 - Electric resistance heating not allowed



Space Conditioning Systems Prescriptive Requirements

Nonresidential § 140.4(h)5

Updated for 2025

Cooling tower efficiency

- Axial fan, open-circuit cooling towers with capacity of 900 gpm or greater
 - Minimum efficiency per [Table 140.4-H-2](#)
- Exception
 - Replacement of existing cooling towers inside existing building or on existing roof

Table 140.4-H-2 Minimum Efficiency For Propeller Or Axial Fan Open-circuit Cooling Towers (GPM/hp)

CZ 1	CZ 2	CZ 3	CZ 4	CZ 5	CZ 6	CZ 7	CZ 8	CZ 9	CZ 10	CZ 11	CZ 12	CZ 13	CZ 14	CZ 15	CZ 16
42.1	70	60	70	70	80	80	80	80	80	60	70	80	60	80	42.1



Space Conditioning Systems Prescriptive Requirements

Nonresidential § 140.4(r)

New for 2025

DDC controller logic per ASHRAE Guideline 36

- HVAC systems with DDC controllers must use controller logic originating from a programming library based on sequences of operation from ASHRAE Guideline 36
 - All controllers capable of being field programmed
 - Entirety or all applicable portions of equipment control for configurations included in programming library
 - Programming library must be certified to Energy Commission as meeting Reference Joint Appendix JA18



Space Conditioning Systems Prescriptive Requirements

Nonresidential § 140.4(r)

Updated for 2025

DDC controller logic per ASHRAE Guideline 36

- Exceptions
 - Non-programmable (configurable-only) controllers for zone terminal units follow applicable ASHRAE Guideline 36 zone sequences per JA18 Table 18.3-1
 - Not subject to certification requirements
 - Logic from certified programming library modified to suit application-specific operation not included in Guideline 36 sequences
 - Systems serving healthcare facilities



Space Conditioning Systems Prescriptive Requirements

Nonresidential § 140.4(s)1A

Updated for 2025

Simultaneous mechanical heat recovery either

- $CHL + 0.1 * CLL \geq 200$ tons and $SWHCAP + HCAP \geq 2200$ kBtuh
- $CCAP \geq 300$ tons and $SWHcap + 0.1 * HCAP \geq 700$ kBtuh
- Where
 - $CCAP$ = design capacity of all mechanical cooling systems
 - CHL = coincident peak cooling load of all spaces with a design equipment power density > 5 watts/ft² and a minimum outdoor airflow requirement < 0.5 cfm/ft², i.e., high load spaces
 - CLL = $CCAP - CHL$. If the design includes capacity for future cooling systems, then assume 20% of future systems serve high load spaces
 - $SWHCAP$ = design capacity of all service water heating (SWH) systems, excluding systems expected to operate less than 5 hours per week, such as instant-hot water systems for emergency eyewash stations
 - $HCAP$ = design capacity of all space heating systems



Space Conditioning Systems Prescriptive Requirements

Nonresidential § 140.4(s)1B

Updated for 2025

Mechanical heat recovery

- Heat recovery system must include heat recovery chiller, or other means, capable of transferring the lesser of the following from spaces in cooling to spaces in heating and/or to the service water heating (SWP) system
 - 25% of the peak heat rejection of the cooling system
 - 25% of (SWHCAP + HCAP)
 - Where
 - SWHCAP = design capacity of all service water heating (SWH) systems, excluding systems expected to operate less than 5 hours per week, such as instant-hot water systems for emergency eyewash stations
 - HCAP = design capacity of all space heating systems
- **Exceptions**
 - Laboratory buildings with exhaust air heat recovery systems per § 140.9(c)6
 - Buildings in Climate Zone 15 with SWHCAP less than 600 kBtuh



Space Conditioning Systems Prescriptive Requirements

Nonresidential § 140.4(s)2

Updated for 2025

Heat recovery for service water heating

- If required per § 140.4(s)1 to have simultaneous mechanical heat recovery and SWHCAP ≥ 500 kBtuh, heat recovery system must
 - Heat or preheat service hot water
 - Have capacity to transfer the smaller of
 - 30% of the peak heat rejection of the cooling system
 - 30% of SWHCAP
 - Where
 - SWHCAP = design capacity of all service water heating (SWH) systems, excluding systems expected to operate less than 5 hours per week, such as instant-hot water systems for emergency eyewash stations
- Exception to § 140.4(s)
 - Buildings with computer room heat recovery system or wastewater heat recovery system capable of providing not less than 25% of SWHCAP + HCAP



Space Conditioning Systems Alterations Prescriptive Requirements

Nonresidential § 141.0(b)2C

Updated for 2025

New or replacement space-conditioning systems or components

- New systems or components except ducts meet § 140.4
 - Additional fan power allowances per Table 141.0-D
 - New or replacement single zone packaged rooftop systems with direct expansion cooling with rated cooling capacity less than 65,000 Btu/h either
 - Meet Table 141.0-E-1
 - Meet performance requirements of § 141.0(b)3
 - Exception: § 141.0(b)2Cii not applicable if alteration exceeds existing main service panel or service transformer capacity, electrical load calculation submitted by registered professional engineer per Article 220 of California Electrical Code



- SZHP = single zone heat pump plus economizer per § 140.4(e)
- SZAC1 = either
 - Single zone air conditioner with furnace plus variable speed fan and economizer per § 140.4(e)
 - Dual fuel heat pump plus variable speed fan and economizer per § 140.4(e)
- NR = No requirement

[illegible]



Space Conditioning Systems Alterations Prescriptive Requirements

Nonresidential § 141.0(b)2C

New for 2025

Exceptions

- § 140.4(a)2 does not apply to new or replacement space conditioning systems or components
- § 140.4(a)3 does not apply to new or replacement space conditioning systems or components
- § 140.4(n) not applicable to newly installed or replacement space conditioning systems with existing operable wall or roof openings without interlock controls



Space Conditioning Systems Alterations Prescriptive Requirements

Nonresidential § 141.0(b)2C

New for 2025

Exceptions

- Requirements for ASHRAE Guideline 36 in § 140.4(c)2Bii, § 140.4(d)2Av, § 140.4(e)2D, § 140.4(f)3, and § 140.4(r) do not apply to individual new or replacement components unless entire space conditioning-systems are new or replaced
- § 140.4(e) not applicable to systems that both:
 - Are not single package air-cooled commercial unitary air conditioner or heat pump
 - Have cooling capacity less than 54,000 Btu/h



2025 Covered Processes Changes Nonresidential



Covered Processes Mandatory Requirements

Nonresidential § 120.6(a)3

New for 2025

Evaporators

- New fan-powered evaporators in coolers and freezers utilizing volatile refrigerants must meet efficiency requirements under Table 120.6-A-2
- Applied static pressure drop for evaporators shall not exceed 0.5 inches of water
- **Exception:** Evaporators designed solely for quick chilling/freezing of products



Covered Processes Mandatory Requirements

Nonresidential § 120.6(h)5A

Updated for 2025

Controlled Environmental Horticulture (CEH)

- Buildings with CEH spaces or greenhouses with more than 40 kW of aggregate horticultural lighting load, electric lighting system for plant growth and maintenance must:
 - Have a photosynthetic photon efficacy (PPE) rated per ANSI/ASABE S640 for wavelengths from 400 to 700 nanometers, and
 - Luminaire rated PPE must be at least 2.3 micromoles per joule



Covered Processes Mandatory Requirements

Nonresidential § 120.6(k)

Updated for 2025

Electric-ready for commercial kitchens in newly constructed buildings

- Quick-service commercial kitchens and institutional commercial kitchens must have:
 - Dedicated branch circuit wiring and outlet accessible to cookline appliances:
 - Branch circuit conductors rated minimum 50 amps
 - Electrical service panel minimum capacity of 800 connected amps
- Electrical service panel sized to accommodate either:
 - Additional 208v or 240v 50-amp breaker
- **Exceptions**
 - Healthcare facilities
 - All-electric commercial kitchens



Covered Processes Mandatory Requirements

Nonresidential § 140.9(c)1

Updated for 2025

Exhaust airflow reduction for laboratories

- Laboratory exhaust must:
 - Be able to reduce zone exhaust and makeup airflow per demand and occupancy to the greater of the following:
 - Regulated minimum occupied circulation rate documented to meet code, accreditation, or facility health and safety requirements, or
 - Minimum needed to maintain occupied pressurization
 - User-defined airflow up to:
 - 1.0 cubic feet per minute per square foot when occupant sensors detect occupants
 - 0.67 cubic feet per minute per square foot, within 20 minutes of no occupancy detected
 - Certified as meeting acceptance requirements per NA7.16



Covered Processes Prescriptive Requirements

Nonresidential § 140.9(c)3B&C

Updated for 2025

Exhaust fan power for labs and factories

- Fan exhaust systems above 10,000 cfm must meet ANSI discharge requirements and one of the following of § 140.9(c)3B, C or D
- § 140.9(c)3B, C options are:
 - Fan power per § 140.4(c)1A&B
 - Max fan power =
 - 0.85 watts per cubic feet per minute for systems with air treatment devices (e.g., filtration, scrubbers)
 - 0.65 watts per cubic feet per minute for all other exhaust fan systems



Covered Processes Prescriptive Requirements

Nonresidential § 140.9(c)3D

Updated for 2025

Exhaust fan power for labs and factories

- Fan exhaust systems above 10,000 cfm must meet ANSI discharge requirements and one of § 140.9(c)3B, C or D
- § 140.9(c)3D requires all of the following:
 - Sum of occupied minimum circulation rates below 60% design airflow
 - No more than 1.3 watts per cubic feet per minute at full load
 - Variable speed controls so that fans draw no more than 40% power at 60% design airflow
 - Max airflow = (whichever is larger):
 - Sum of exhaust airflows served by system
 - Minimum acceptable exhaust fan airflow (one of the following):
 - Up to 60% of fan design airflow (simple turndown control system), or
 - Dynamically reset per wind speed and/or direction or contaminant concentration
 - Design and control results in calculated outdoor contaminant concentrations meeting federal, state, or local regulations
 - Certified as meeting acceptance requirements per NA7.16



Covered Processes Prescriptive Requirements

Nonresidential § 140.9(c)5

New for 2025

Reheat limitation for labs

- If above 20,000 cfm of lab exhaust serving multiple space conditioning zones in lab spaces, AHUs must not:
 - Mechanically cool AHU supply air below 80°F
 - Heat AHU supply air above 50°F
- Each zone must have heating and cooling capacity, to prevent cooling at AHU and zonal reheating
- Some exceptions may apply



Covered Processes Prescriptive Requirements

Nonresidential § 140.9(c)6

New for 2025

Exhaust air heat recovery for labs

- Buildings with over 10,000 cfm of lab exhaust must have exhaust air heat recovery that meets the following:
 - Sensible energy recovery ratio of at least:
 - 45% at heating design conditions
 - 25% at cooling design conditions
 - Heat recovered from at least 75% of all lab exhaust air volume
 - System includes:
 - Run-around coil pump or other means to disable heat recovery
 - Bypass damper or other means so that exhaust air pressure drop through heat exchanger does not exceed 0.4 inches of water when heat recovery disabled
- Some exceptions may apply



2025 Water Heating, Pools & Spas Changes Nonresidential



Water Heating Mandatory Requirements

All buildings §110.3(c)7A-B

New for 2025

Heat pump water heaters (HPWHs)

- Adds external or internal backup heat required:
 - Inlet air unconditioned
 - Compressor cutoff temperature above winter median of extremes (JA2 Table 2-3)
- Adds ventilation requirements
 - Minimum ventilation space
 - At least 100 ft³ per kBtu/h
 - Manufacturer requirement, if greater
 - Louvered/grilled permanent openings or doors with minimum net free area
 - When ducts used:
 - R-6 insulation exhaust ducts and ducts crossing pressure boundaries
 - Air seal all connections and boundary crossings



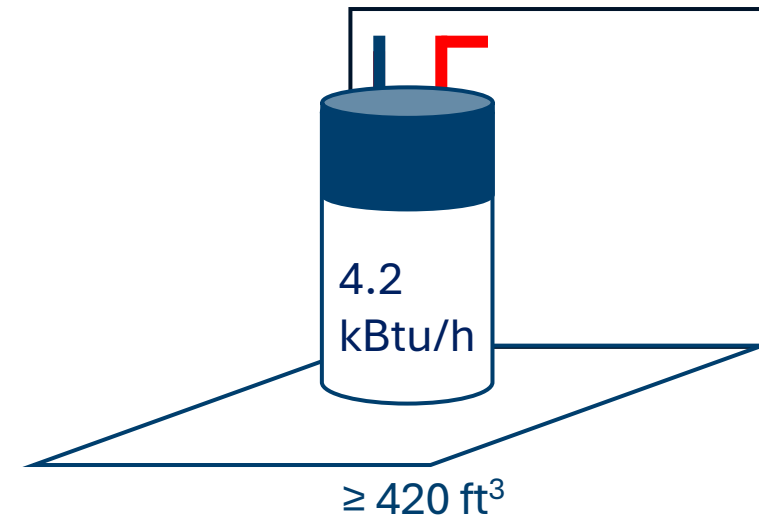
Water Heating Mandatory Requirements

All buildings §110.3(c)7B2

New for 2025

Air-source heat pump water heaters

- Minimum ventilation space
 - Installation space plus ventilation space at least 100 ft³ per kBtu/h or per manufacturer requirement, whichever is greater



§110.3(c)7B2 – installation space meets minimum ft³



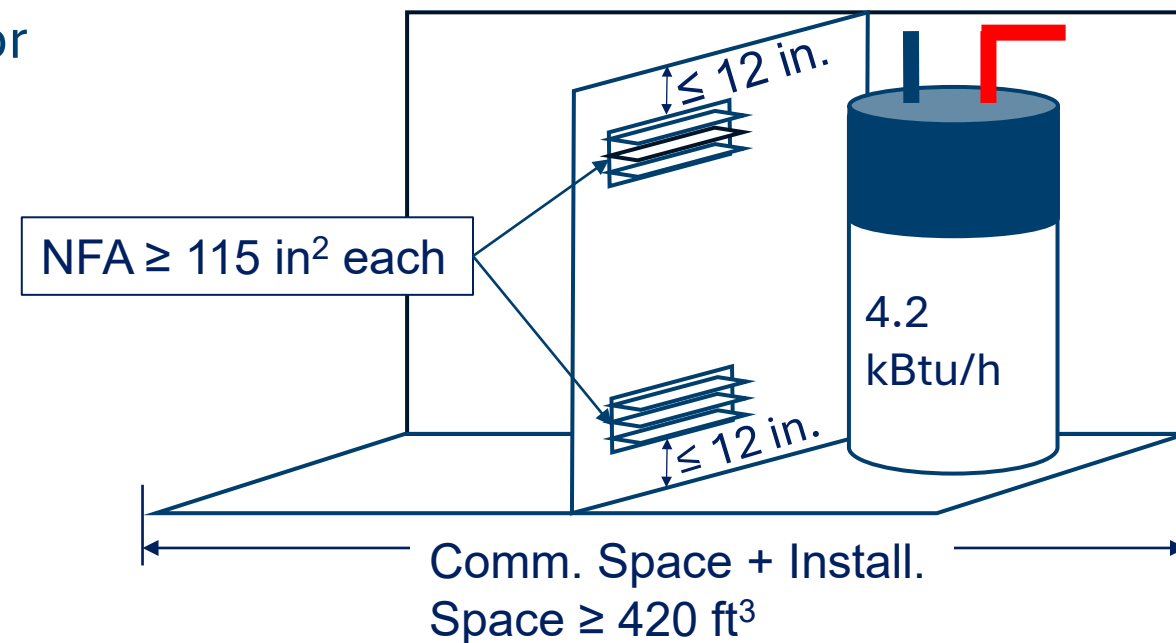
Water Heating Mandatory Requirements

All buildings §110.3(c)7B3

New for 2025

Air-source heat pump water heaters

- Adds ventilation requirements
 - Louvered or grilled permanent openings or doors with minimum net free area



§110.3(c)7B3 – using two equal louvered openings (or louvered door)



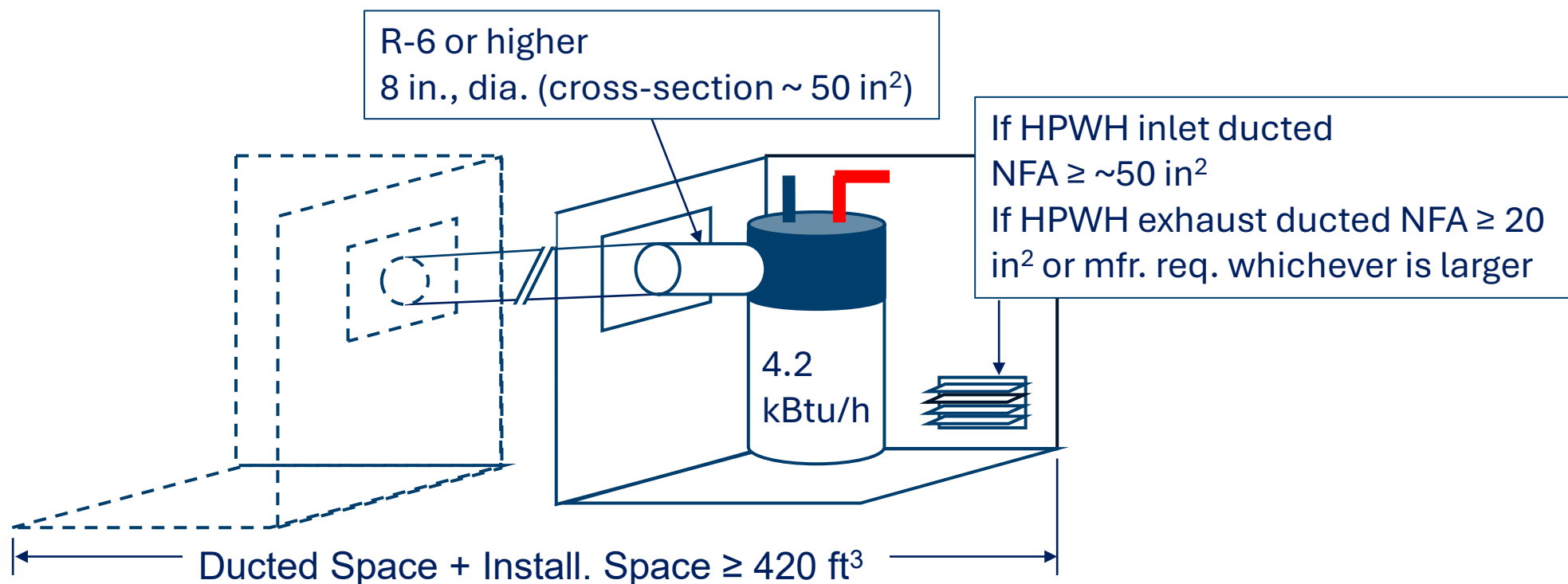
Water Heating Mandatory Requirements

All buildings §110.3(c)7B4

Air-source heat pump water heaters

New for 2025

- Adds ventilation requirements
 - When ducts used:
 - R-6 insulation exhaust ducts and ducts crossing pressure boundaries
 - Air seal all connections and boundary crossings





Pipe Insulation Mandatory Requirements

Nonresidential § 120.3(c), Table 120.3-A1

Updated for 2025

- Table 120.3-A1 pipe insulation thickness for heating

Fluid Operating Temperature Range (°F)	Insulation Conductivity (in Btu·in/h·ft²·°F)	Insulation Mean Rating Temperature (°F)	Nominal Pipe Diameter < 1 inch	Nominal Pipe Diameter 1 to < 1.5 inches	Nominal Pipe Diameter 1.5 to < 4 inches	Nominal Pipe Diameter 4 to < 8 inches	Nominal Pipe Diameter 8 inches and larger
Above 350	0.32-0.34	250	4.5 inches	5.0 inches	5.0 inches	5.0 inches	5.0 inches
Above 350	0.32-0.34	250	R 37	R 41	R 37	R 27	R 23
251-350	0.29-0.32	200	3.0 inches	4.0 inches	4.5 inches	4.5 inches	4.5 inches
251-350	0.29-0.32	200	R 24	R 34	R 35	R 26	R 22
201-250	0.27-0.30	150	2.5 inches	2.5 inches	2.5 inches	3.0 inches	3.0 inches
201-250	0.27-0.30	150	R 21	R 20	R 17.5	R 17	R 14.5
141-200	0.25-0.29	125	1.5 inches	1.5 inches	2.0 inches	2.0 inches	2.0 inches
141-200	0.25-0.29	125	R 11.5	R 11	R 14	R 11	R 10
105-140	0.22-0.28	100	1.0 inch	1.5 inches	1.5 inches	1.5 inches	1.5 inches
105-140	0.22-0.28	100	R 7.7	R 12.5	R 11	R 9	R 8



Pool and Spa Heating Mandatory Requirements

All buildings § 110.4(a-b)

Updated for 2025

- Certification by manufacturers
 - Relocates electric resistance heating to § 110.4(c)
 - Energy efficiency rating required on permanent, legible, weatherproof card, with instructions for energy efficient heater operation
- Adds heating equipment selection per Table 110.4-A (below)
- Modifies pipe requirement between filter and heater/connections to 18 inches of horizontal or vertical piping

Heating Energy Source	Standard
Electric Resistance	UL 1261
Gas-fired	ANSI Z21.56/CSA 4.7a
Heat Pump	AHRI 1160 and one of the following: CSA C22.2 No. 236, UL 1995, or UL/CSA 60335-2-40
Solar	ICC/APSP 902/SRCC 400 for solar pool heaters, ICC 901/SRCC 100 for solar collectors



Pool and Spa Heating Mandatory Requirements

All buildings § 110.4(c), JA16

New for 2025

Heat source sizing

- Adds requirement for primary pool heater when new pool heater installed
 - Requires either
 - Solar swimming pool and/or spa heating system as main heating system
 - Heat pump pool heater as main heating system
 - Heating system that derives heating energy from on-site renewable or recovered energy

Appendix JA16 criteria for pool and spa heating

- Adds appendix to support heat source sizing requirement
- Includes sizing method for heat pump pool heater



Pool and Spa Heating Mandatory Requirements

All buildings § 110.4(c)

New for 2025

Exceptions

- Portable electric spas meeting Title 20
- Buildings with existing pool and spa heating systems and equipment
- Pool and spas heated solely by solar heating system
- Heating system for permanent spas in existing building
 - Gas available
 - Inadequate solar access



2025 Lighting Changes Nonresidential



Lighting Controls Mandatory Requirements

Nonresidential § 130.1(a-b)

Updated for 2025

- Clarifies manual controls must be in same space as controlled lighting, or located where lighting status visible
- Removes Table 130.1-A - all multilevel controls must provide and enable continuous dimming from 100% to 10%
 - Light sources with high-intensity discharge (HID) and induction lamps must have one control step between 30% and 70%



Lighting Controls Mandatory Requirements

Nonresidential § 130.1(c)

Updated for 2025

- Occupant sensor delay must be no more than 20 minutes
- Exception 4 to § 130.1(c)1 – Language clarified to exempt emergency lighting intended to function in emergency mode during power outages
- Removed exception for warehouse aisles and open areas to reduce lighting power by 40% (instead of 50%)
- Parking garage and loading/unloading areas requirements moved to § 130.1(c)6E
 - Hotel/motel stairwell and corridors now meet § 130.1(c)1



Daylight Responsive Controls Mandatory Requirements

Nonresidential § 130.1(d)

Updated for 2025

- Daylight responsive controls now required in daylit zones with 75 watts or more of general lighting
 - Exempts secondary sidelet daylit zones with less than 85 watts of general lighting, if primary sidelit daylit zones don't require daylight responsive controls
- General lighting luminaires over 8 feet must be controlled in segments no more than 8 feet
 - If luminaire contains factory-assembled housing and light source as integral unit in segments over 8 feet, may be controlled according to daylit zone in which segment is mainly located



Lighting Acceptance Testing Mandatory Requirements

Nonresidential § 130.4(a)

New for 2025

- Adds acceptance testing requirements for controlled environmental horticulture lighting meeting § 120.6(h)5B



Lighting Power Allowances Prescriptive Requirements

Nonresidential § 140.6

Updated for 2025

- Removes Tailored Method
 - Some allowances for sales areas, bar/lounges, dining areas moved to Area Category Method:
 - Wall and floor displays
 - Task lighting of certain mounting heights



Sign Lighting Prescriptive Requirements

Nonresidential § 140.8(b)

Updated for 2025

- Removes most automatically-compliant alternative light sources
 - Neon or cold cathode lamps
 - LEDs with power supply efficiency of 80% or more



Resources



Energy Code Support Center



<https://www.energy.ca.gov/energy-code-support-center>

Energy Code FAQs

Expand All

Where are the compliance documents (forms)?

How can I get a copy of the Energy Code, Reference Appendices, Manuals?

Who do I contact for compliance modeling software questions?

Where do I find my climate zone?

How do I participate in the upcoming Energy Code rulemaking?

What local ordinances are approved?

Are there any regulatory advisories?

Is there help with finding incentives, rebates, and financing?

Where do I report an issue with a contractor or business professional?

Where can I ask an Energy Code question that is not answered here or on a specific project?

Information, Training, and Resources

Expand All

Training classes, Energy Code overviews, and the Blueprint newsletter

+

Solar PV systems, solar-ready, and electric-ready

+

Battery, energy storage systems (ESS), and ESS-ready

+

Heating, ventilation, and air conditioning (HVAC) mechanical systems

+

Water heating systems

+

Lighting systems (indoor, outdoor, signs)

+

Envelope components (window, roof, insulation, etc.)

+

Electrical power distribution

+

Building commissioning

+

Covered processes

+

HERS raters

+

Acceptance test technicians (ATTs)

+

- **FAQs**
- **Handouts**
 - Fact sheets
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- **Tools**
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 - Blueprint newsletter
- **Training**
 - Presentations
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 - Internal resources
 - External resources



Energy Code Hotline

Energy Code Hotline Submission Form

Please submit your Energy Code questions through the Energy Code Inquiry Submission Form.

Contact and General Information

What is your name? ⓘ *

What is your email address? ⓘ *

What is your question about? ⓘ *

What is your role? ⓘ

Building and Project Information

What is the building type? ⓘ *

What is project type/scope of the building? ⓘ *

Is the building conditioned (heating and/or cooling) or unconditioned (no heating or cooling)? ⓘ *

Please list the climate zone of the project. Alternatively, please enter the address of the project. ⓘ *

- Monday through Friday
 - 8:00 a.m. to 12:00 p.m.
 - 1:00 p.m. to 4:30 p.m.
- Call
 - 800-772-3300 in CA
 - 916-654-5106 outside CA
- Contact
 - [Hotline Submission Form](#)



Blueprint Newsletter

- Energy Code quarterly newsletter
 - Updates
 - Clarifications
 - Frequently asked questions



Blueprint Newsletter: Winter 2026

Blueprint quarterly newsletter focuses on Energy Code updates, announcements, and frequently asked questions. Blueprint newsletter serves as a resource to assist stakeholders in complying with the Energy Code. It does not provide legal advice. Please refer to the California Code of Regulations, Title 24, Parts 1 and 6 for specific requirements.

CONTACT

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Toll-free in California: 800-772-3300
Outside California: 916-654-5106

FOR MORE INFORMATION

[Energy Code Support Center](#)
[Home Energy Rating System \(HERS\)](#)
[Acceptance Test Technician Certification Provider Program \(ATTCP\)](#)
[2022 Approved Compliance Software](#)

- ENERGY STAR Exemption for Single-Family Heat Pumps
- 2025 Restructured Energy Code
- 2025 Energy Code: Compliance Software Updates
- Updated Unitary AC and Heat Pump Modeling in CBECC
- 2025 Energy Code: Compliance Documents
- 2025 Energy Code: Energy Code Compliance Provider
- 2025 Energy Code: Acceptance Test Technician Certification Providers
- 2028 Energy Code: School Prototypes
- State Fire Marshal Informational Bulletin 26-003
- Energy Code Support Center Updates
 - 2025 Accessory Dwelling Units (ADUs) Online FAQs
 - 2025 Controlled Environmental Horticulture (CEH) Online FAQs
 - 2025 Electric Readiness for New Commercial Kitchens Online FAQs
 - Guidance regarding 2025 and 2022 Process Boiler Mandatory Stack-Gas Oxygen Concentration
- Outreach & Education 2025 Year in Review
- Q&As

ENERGY STAR Exemption for Single-Family Heat Pumps



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Local Energy Codes

- <https://localenergycodes.com/>

Statewide Reach Codes Program



REACH CODE PATHS

Explore options for different types of reach codes

COST EFFECTIVENESS EXPLORER

Build policies from cost-effectiveness study results

RESOURCES

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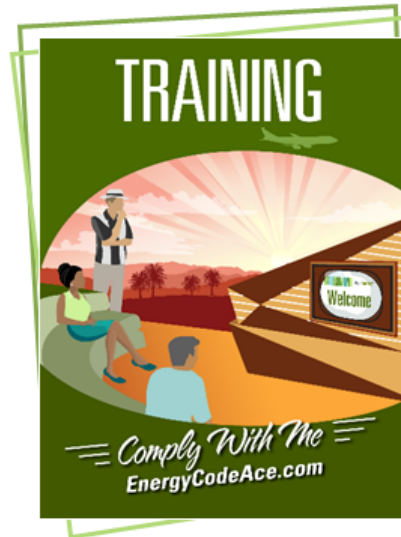
FAQS

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Energy Code Ace



Tools help automate tasks:

- ✦ Energy Code Product Finder
- ✦ Forms Ace
- ✦ Image Ace
- ✦ Navigator Ace
- ✦ Nonres. Indoor Lighting Wheel
- ✦ Q&Ace
- ✦ Reference Ace
- ✦ Timeline Ace
- ✦ Virtual Compliance Assistant

Training is activity based and delivered in a variety of formats:

- ✦ Live Online instructor-led
- ✦ Online self-study
- ✦ Recorded webinars
- ✦ YouTube — live streaming & videos

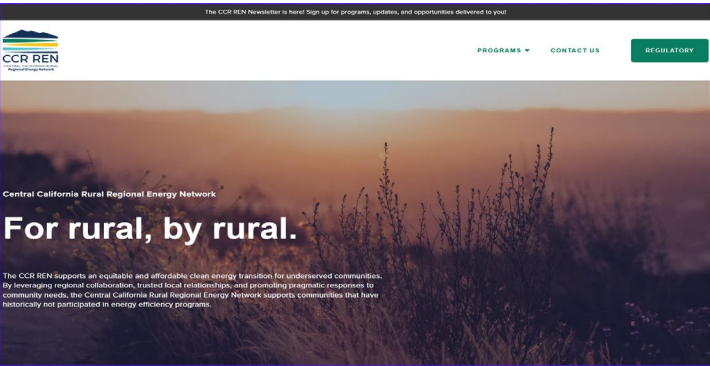
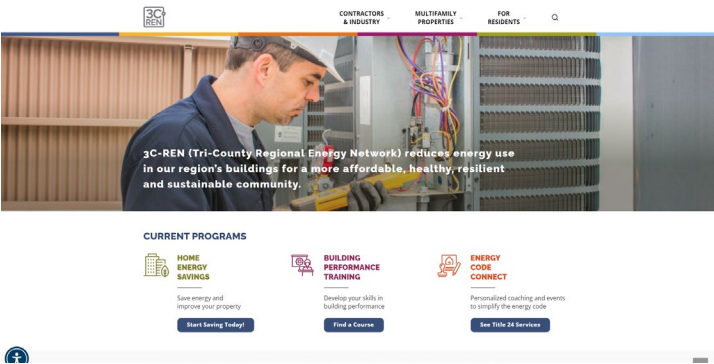
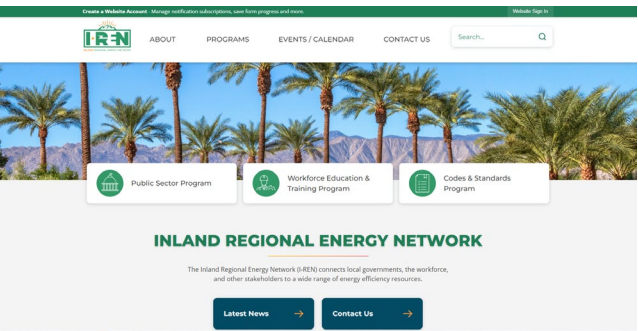
Resources provide quick, useful guidance:

- ✦ Fact Sheets
- ✦ Checklists
- ✦ Application Guides
- ✦ Submit a Question
- ✦ Trigger Sheets
- ✦ Useful Links

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Local RENs





Thank You!