



2022 Energy Code

Multifamily Electrical Power Distribution (EPD) Requirements

California Energy Commission

March 2024



Agenda

- 2022 Energy Code basics
- Multifamily requirements
 - Mandatory
 - Additions and alterations
- Resources



2022 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

WARREN-ALQUIST ACT

Warren-Alquist
State Energy Resources
Conservation and
Development Act

Public Resources Code
Section 25000 et seq.



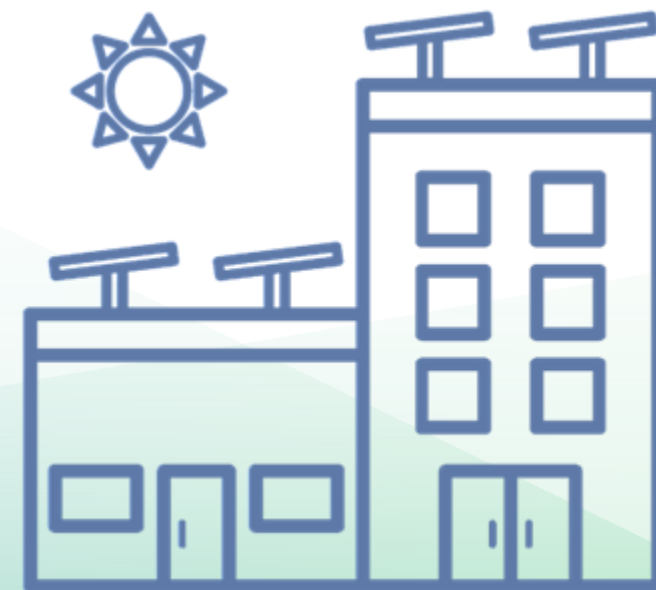
CALIFORNIA
ENERGY COMMISSION
Gavin Newsom, Governor

2022 EDITION
JANUARY 2022
CEC-140-2022-001



2022 Energy Code Goals

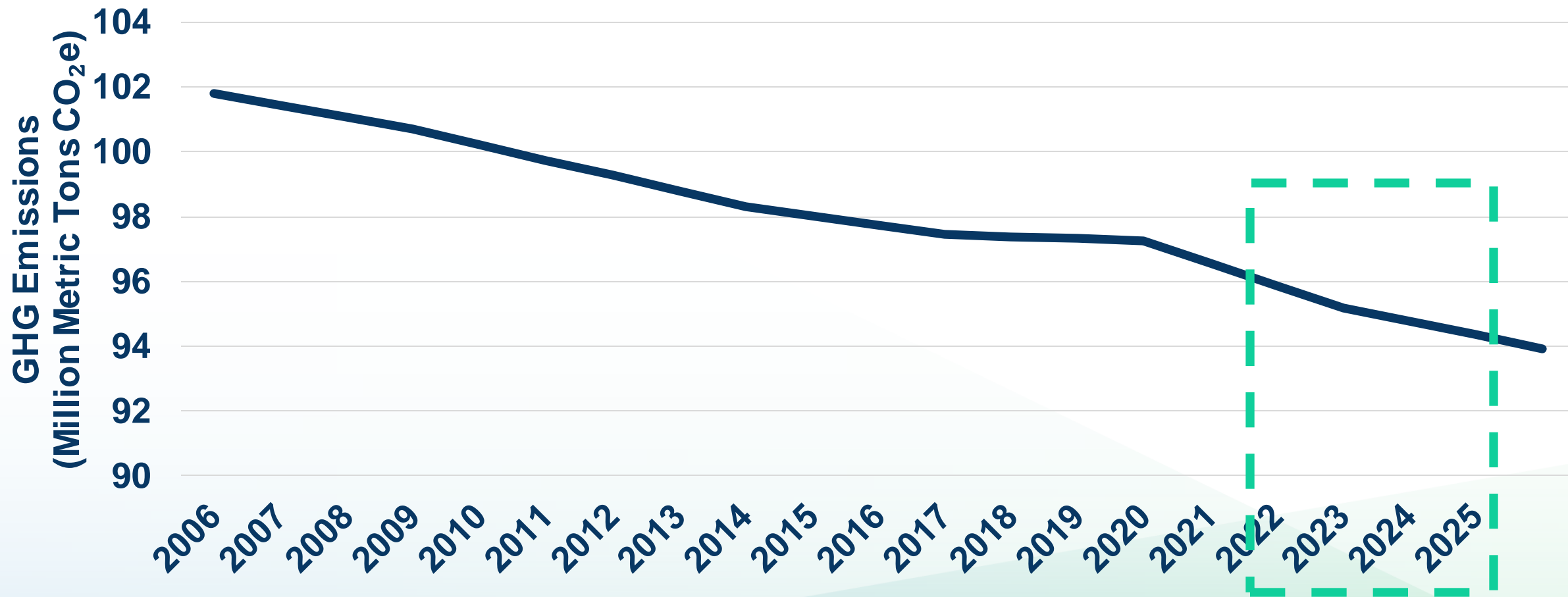
- Increase building energy efficiency cost-effectively
- Contribute to California's greenhouse gas (GHG) reduction goals
- Enable pathways for all-electric buildings
- Reduce residential building impacts on the electricity grid
- Promote demand flexibility and self-utilization of photovoltaic (PV)
- Provide tools for local government reach codes





Energy Code Environmental Benefit

Reduced Statewide Emissions



Source: CEC Impact Analysis 2005, 2008, 2013, 2016, 2019, 2022



2022 Energy Code

Effective January 1, 2023

- Building permit applications submitted on or after Jan 1, 2023
- Must use 2022 tools
 - Software
 - Forms





2022 Documents Online

2022 Building Energy Efficiency Standards

The Building Energy Efficiency Standards (Energy Code) apply to newly constructed buildings, additions, and alterations. They are a vital pillar of California's climate action plan. The 2022 Energy Code will produce benefits to support the state's public health, climate, and clean energy goals.

The California Energy Commission (CEC) updates the Energy Code every three years. On August 11, 2021, the CEC adopted the 2022 Energy Code. In December, it was approved by the California Building Standards Commission for inclusion into the California Building Standards Code. The 2022 Energy Code encourages efficient electric heat pumps, establishes electric-ready requirements for new homes, expands solar photovoltaic and battery storage standards, strengthens ventilation standards, and more. Buildings whose permit applications are applied for on or after January 1, 2023, must comply with the 2022 Energy Code.

2022 Energy Code for Residential and Nonresidential Buildings

[2022 ENERGY CODE >](#)



Expand All

Supporting Documents – Appendices, Compliance Manuals, and Forms

Software – Compliance Software, Manuals, and Tools

BUILDING ENERGY EFFICIENCY STANDARDS - TITLE 24

2025 Building Energy Efficiency Standards

2022 Building Energy Efficiency Standards

— Workshops, Notices, and Documents

2019 Building Energy Efficiency Standards

2016 Building Energy Efficiency Standards

Past Building Energy Efficiency Standards

Climate Zone tool, maps, and information supporting the California Energy Code

Online Resource Center

Solar Assessment Tools

RELATED LINKS

Workshops, Notices, and Documents

CONTACT

[Building Energy Efficiency Standards - Title 24](#)

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

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Building Energy Efficiency Standards

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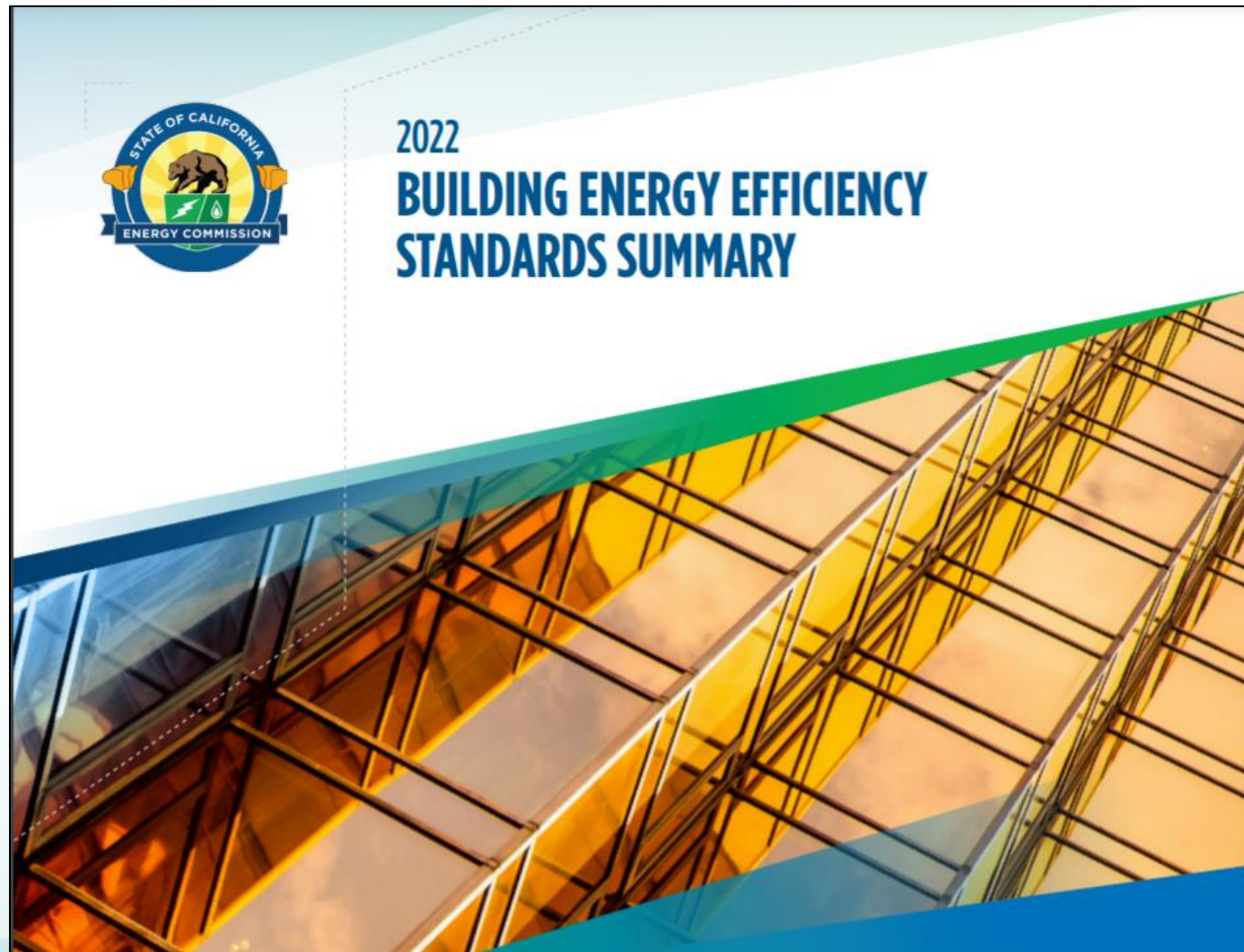
- Energy Code
- Reference Appendices
- Compliance Manuals
- Software
- Forms





2022 Energy Code Highlights

- Heat pump baselines
- Solar and battery storage
- Ventilation requirements
- Lighting
- Multifamily restructuring





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





2022 Performance Metrics

New for 2022

Source energy performance calculations

- Nonresidential and multifamily
 - Hourly source energy
 - TDV Efficiency
 - TDV Total
 - Efficiency, PV + battery



Demonstrating Compliance

Compliance forms confirm Energy Code is met

Updated for 2022

- Completed by responsible party
 - Designers, consultants, builders, contractors, technicians, HERS raters, etc.
- Submitted to enforcement agencies for verification

Type of form	Single-family	Multifamily 3 or less habitable stories	Nonresidential Multifamily 4 or more habitable stories
Certificate of compliance	CF1R	LMCC	NRCC
Certificate of installation	CF2R	LMCI	NRCI
Certificate of verification	CF3R	LMCV	NRCV
Certificate of acceptance	-	-	NRCA



Forms Registration and Certification

All Buildings § 10-103

Updated for 2022

Multifamily buildings 3 or fewer habitable stories

- When HERS verification is required all LMCC, LMCI, and LMCV forms must be registered with HERS provider data registry

Multifamily buildings 4 or more habitable stories

- NRCV must be registered with HERS provider when required
- When lighting or mechanical acceptance test is required all NRCC, NRCI, and NRCA forms must be recorded with ATTCP



2022 Compliance Software

Performance approach must use approved compliance software versions

- Nonresidential and multifamily
 - CBECC 2022.3.0
 - EnergyPro 9.2
 - IES 2.0



Mandatory Requirements

(incl. Additions and Alterations)



110.11 Low-Voltage Dry-type Distribution Transformers

Low-voltage dry-type distribution transformers:

- Must be certified by the manufacturer as required by the Title 20 Appliance Efficiency Regulations
- Must be listed in the Modernized Appliance Efficiency Database System

Low-voltage dry-type distribution transformer is a distribution transformer that:

- Has an input voltage of 600 volts or less; and
- Is air-cooled; and
- Does not use oil as a coolant

The screenshot shows the 'Advanced Search' page of the California Energy Commission's Appliance Efficiency Database. The page has a header with the 'CA.GOV' logo and 'CALIFORNIA ENERGY COMMISSION' text. Below the header, there's a 'SEARCH' button. The main content area is titled 'Advanced Search' and includes a brief explanation of the search functionality. It features three dropdown menus for 'Select Appliance Type' (set to 'Transformer Products'), 'Select Appliance' (set to 'Transformers'), and 'Select Appliance Status' (set to 'Approved'). Below these, there's a 'Select Fields to Display' section with checkboxes for various fields like Manufacturer, Brand, Model Number, Transformer Type, Phase, KVA, Output Power, Total Loss Power, Nameplate Efficiency, Efficiency Std, Nameplate Efficiency 2, Efficiency 2 Std, Nameplate Efficiency 3, Efficiency 3 Std, Regulatory Status, Add Date, and Reference Number. At the bottom, there's a 'Filters' section with five rows of dropdown menus, each labeled 'Please Select'. The page concludes with 'Search' and 'Clear' buttons.



110.11 Low-Voltage Dry-type Distribution Transformers Cont.

Exceptions:

- Autotransformer, drive transformer, grounding transformer
- Machine tool transformer, non-ventilated transformer
- Rectifier transformer, regulating transformer
- Sealed transformer, special-impedance transformer
- Testing transformer, transformer with tap range of 20 percent or more
- Uninterruptible power supply transformer
- Welding transformer



160.6(a) Service Electrical Metering

Each electrical service or feeder providing power to common use areas must have a permanently installed metering system that measures electrical energy in accordance with Table 160.6-A

- Utility meter satisfies the metering requirement (show instantaneous kW, kWh over utility defined period)

TABLE 160.6-A MINIMUM REQUIREMENTS FOR METERING OR SUBMETERING OF ELECTRICAL LOAD

Metering Functionality	Electrical Services ¹ rated 50 kVA or less	Electrical Services ¹ rated more than 50kVA and less than or equal to 250 kVA	Electrical Services ¹ rated more than 250 kVA and less than or equal to 1000kVA	Electrical Services ¹ rated more than 1000kVA
Instantaneous (at the time) kW demand	Required	Required	Required	Required
Historical peak demand (kW)	Not required	Not required	Required	Required
Tracking kWh for a user- definable period.	Required	Required	Required	Required
kWh per rate period	Not required	Not required	Not required	Required

¹ "Electrical Services" applies to the building service-entrance rating or to the submetering service. For a building with submetering, this applies to the submetering service size to the common use areas.





160.6(b) Separation of Electrical Circuits

Newly constructed buildings

- EPD system designed to allow for measuring loads according to TABLE 160.6-B
- Allows flexible approaches for providing measuring ability

Alterations

- Only applicable for complete replacements of power distribution systems (most projects will not trigger this)
- **Exceptions:**
 - For each load type, up to 10% of connected load may be of any type
 - Submetered EPD systems providing power to dwelling units

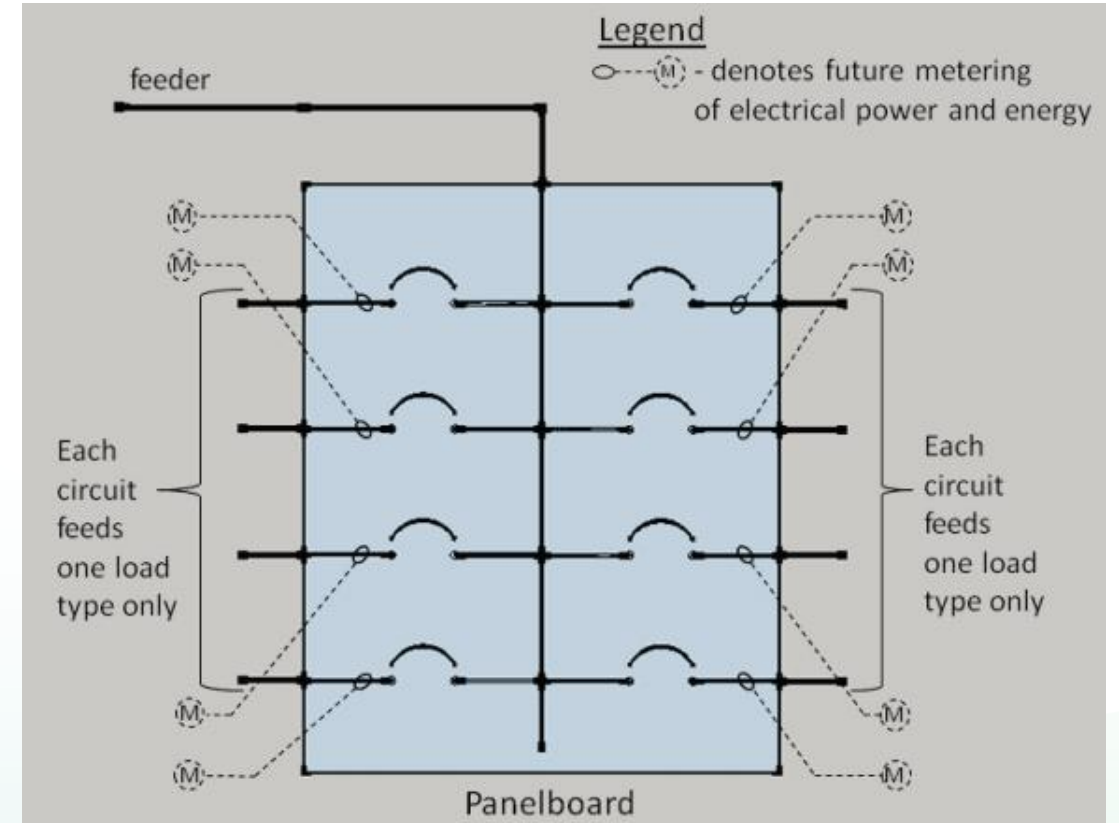




Table 160.6-B

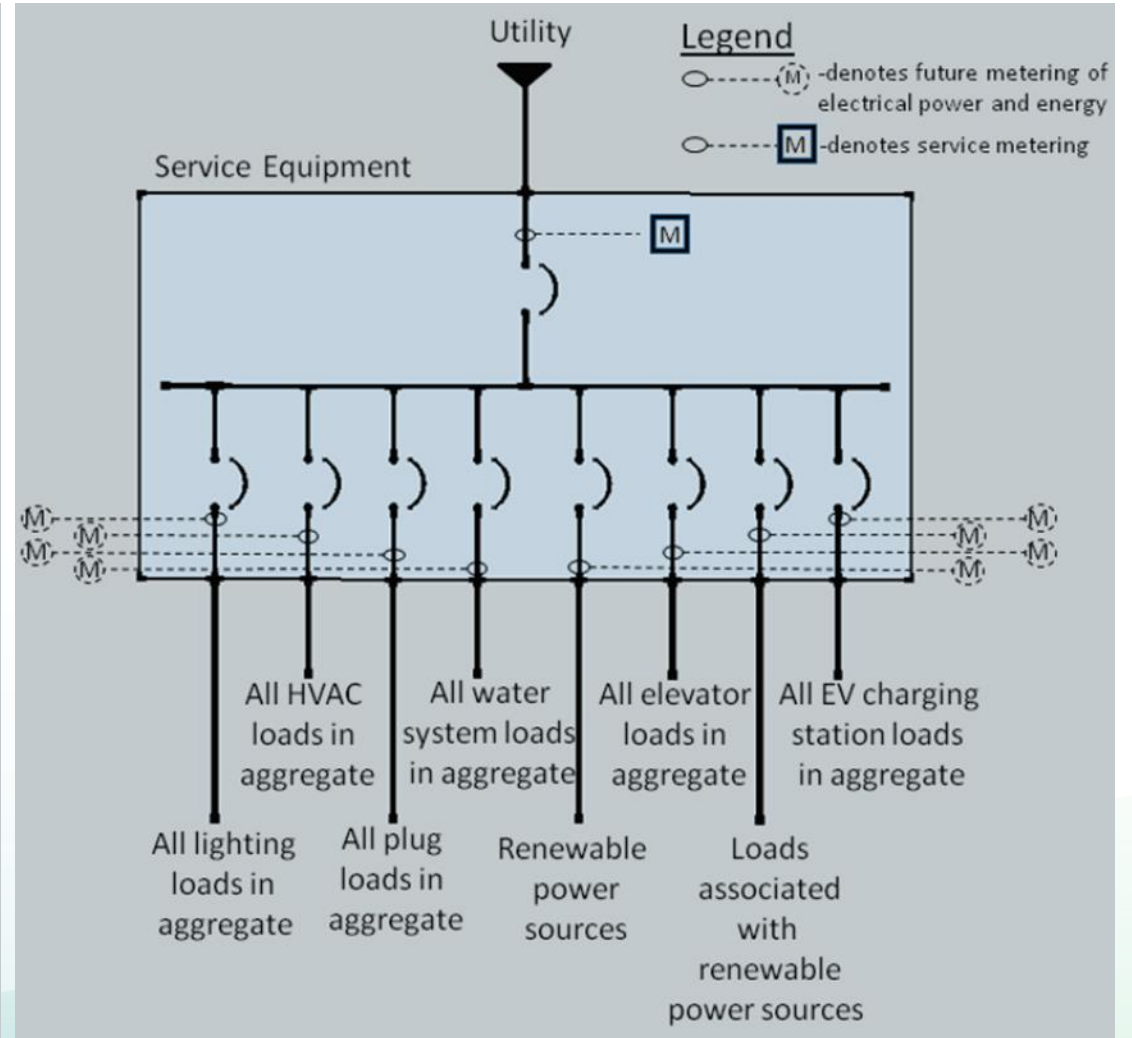
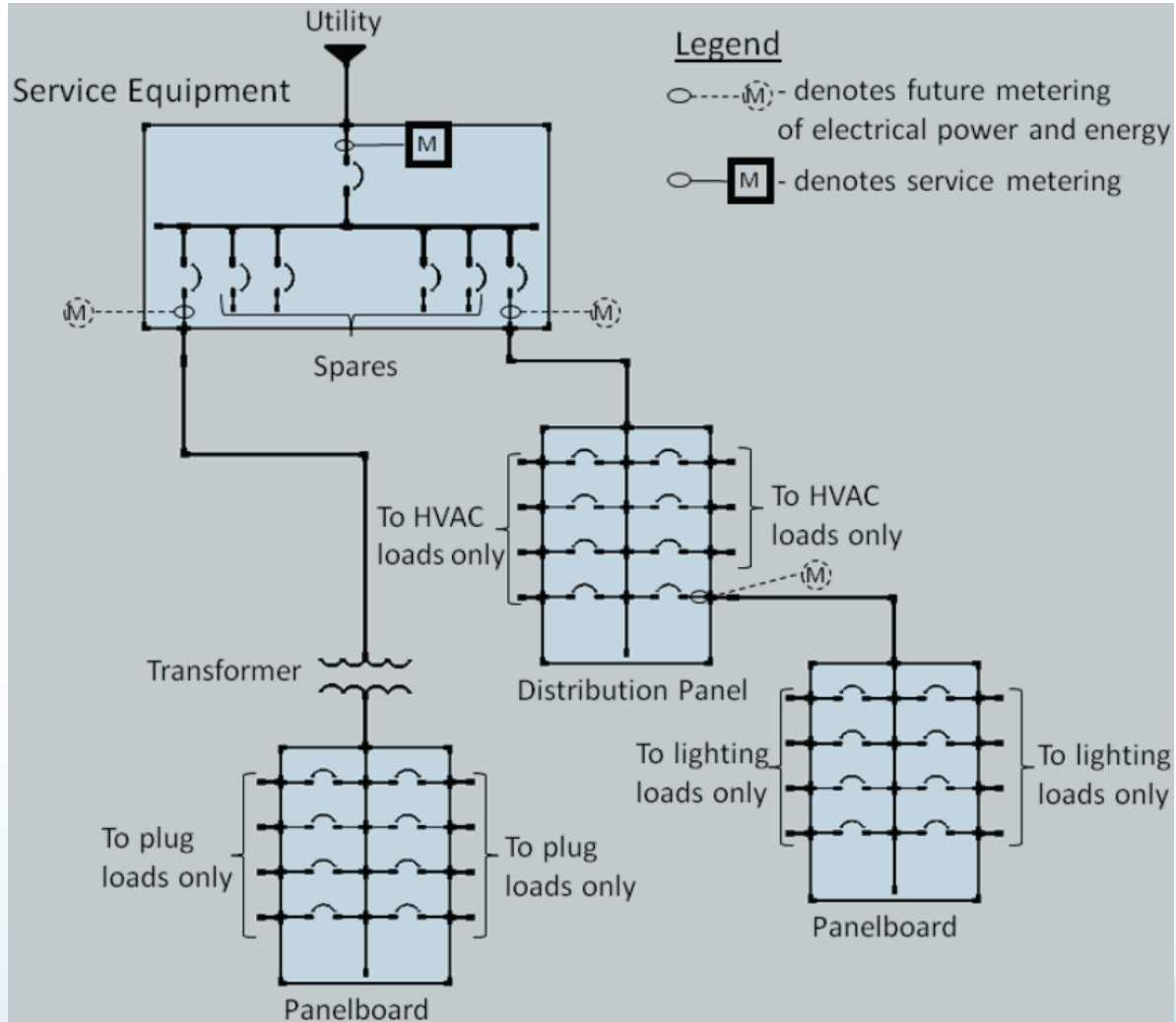
TABLE 160.6-B MINIMUM REQUIREMENTS FOR SEPARATION OF ELECTRICAL LOAD

Electrical Load Type	Electrical Services ¹ rated 50 kVA or less	Electrical Services ¹ rated more than 50kVA and less than or equal to 250 kVA	Electrical Services ¹ rated more than 250 kVA and less than or equal to 1000kVA	Electrical Services ¹ rated more than 1000kVA
Lighting including exit and egress lighting and exterior lighting	Not required	All lighting in aggregate	All lighting disaggregated by floor, type or area	All lighting disaggregated by floor, type or area
HVAC systems and components including chillers, fans, heaters, furnaces, package units, cooling towers, and circulation pumps associated with HVAC	Not required	All HVAC in aggregate	All HVAC in aggregate and each HVAC load rated at least 50 kVA	All HVAC in aggregate and each HVAC load rated at least 50kVA
Domestic and service water system pumps and related systems and components	Not required	All loads in aggregate	All loads in aggregate	All loads in aggregate
Plug load including appliances rated less than 25 kVA	Not required	All plug load in aggregate Groups of plug loads exceeding 25 kVA connected load in an area less than 5000 sf	All plug load separated by floor, type or area Groups of plug loads exceeding 25 kVA connected load in an area less than 5000 sf	All plug load separated by floor, type or area All groups of plug loads exceeding 25 kVA connected load in an area less than 5000 sf
Elevators, escalators, moving walks, and transit systems	Not required	All loads in aggregate	All loads in aggregate	All loads in aggregate
Renewable power source (net or total)	Each group	Each group	Each group	Each group
Loads associated with renewable power source	Not required	All loads in aggregate	All loads in aggregate	All loads in aggregate
Charging stations for electric vehicles	All loads in aggregate	All loads in aggregate	All loads in aggregate	All loads in aggregate

¹ "Electrical Services" applies to the building service-entrance rating or to the submetering service. For a building with submetering, this applies to the submetering service size to the common use area.



160.6(b) Separation of Electrical Circuits Continued





160.6(c) Voltage Drop

Combined voltage drop of feeder conductors and branch circuits must **not exceed 5%**

Alterations

- Applicable when both feeders and branch circuits are added or replaced
- **Exception:** voltage drop permitted by CA Electrical Code Sections 647.4, 695.6, and 695.7



160.6(d) Controlled Receptacles

Controlled receptacles are required in:

- Office areas
- Lobbies
- Conference rooms
- Kitchen areas in office spaces
- Copy rooms

Requirements for controlled receptacles:

- Automatic time-switch controls (plus 2-hour override) or motion control
- Controlled receptacle must be marked
- At least one controlled receptacle or split wired receptacle within 6 feet of uncontrolled receptacle





160.6(d) Controlled Receptacles Cont.

Alterations

- Only applicable for complete replacements of power distribution systems (most alterations will not trigger this)

•Exceptions:

- Receptacles for refrigerators and water dispensers in kitchen areas
- Receptacles a minimum of six feet above the floor for clocks
- Receptacles for network copiers, fax machine, A/V and data equipment other than personal computers in copy rooms
- Receptacles on circuits rated > 20 amps.
- Marked receptacles connected to an uninterruptible power supply intended for continuous use.
- Receptacles in common areas providing shared provisions for living, eating, cooking, or sanitation to dwelling units that would otherwise lack these provisions.



160.6(e) Demand Responsive Controls and Equipment

See §110.12 for requirements for demand responsive controls and equipment, including demand responsive controls for controlled receptacles.

- §110.12(e) Demand Responsive Controlled Receptacles in buildings shall be capable of automatically turning off all loads connected to the receptacle in response to a demand response signal. Requirements:
 - §110.12(c) requirements:
 - 15% or > reduction in lighting power as described in NA7.6.3
 - Control general lighting as required in Section 130.1(b)
 - Lighting reduced with uniform level of illumination requirements in Table 130.1-A
 - **Exceptions:**
 - Buildings not required to have demand responsive lighting controls.
 - Spaces where health and life safety, statute, ordinance or regulations does not permit receptacles to be automatically controlled.



Resources



Online Resource Center

www.energy.ca.gov/orc



Handouts

- Fact sheets
- Guides

Tools

- Checklists
- Blueprint newsletter

Training

- Presentations
- Videos

Links

- Internal resources
- External resources



New Resource Hub

Homeowners and renters

- Information about water and space heating, cooking, EV charging, incentives

Contractors

- Information about training, tools, incentives

Local government representatives

- Information about model policies, permitting, training, incentives

Links on the [Building and Home Energy Resource Hub](#)





Blueprint Newsletter

Energy Code quarterly newsletter

- Updates
- Clarifications
- Frequently asked questions



Issue 138 | April - June 2022

BLUEPRINT

CALIFORNIA ENERGY COMMISSION
EFFICIENCY DIVISION



IN THIS ISSUE

- 2022 Energy Code: Multifamily Summary
- 2022 Energy Code: Compliance Software
- 2019 Energy Code: HERS Verifications
- Q&A
 - Solar PV for Multifamily Buildings
 - Multifamily Water Heating
 - Multifamily Common Use Areas

2022 Energy Code: Multifamily Summary

The 2022 Building Energy Efficiency Standards (Energy Code) reorganizes low-rise (three or fewer habitable stories) and high-rise (four or more habitable stories) multifamily buildings into one building type, updates the multifamily buildings definition in § 100.1, and moves all requirements for multifamily buildings to §§ 160.0-180.4. This and other significant changes include:

Mandatory Requirements

- Updates minimum efficiencies for HVAC equipment; adds minimum efficiency requirements for dedicated outdoor air systems (DOAS), heat pump, and heat recovery chiller packages. § 110.2
- Changes demand responsive lighting controls trigger to 4,000 watts or more; adds requirements for controlled receptacles. §§ 110.12, 160.5(b)4E

- Unifies envelope insulation, vapor retarder, and fenestration requirements. § 160.1
- For dwelling units
 - Adds requirements for central fan integrated ventilation systems requiring a motorized controlled damper, damper controls, and variable ventilation. § 160.2(b)2Aii
 - Requires vented kitchen range hoods ventilation rates or capture efficiencies based on conditioned floor area and fuel type per Tables 160.2-E, F, G. § 160.2(b)2Avic2
 - Requires a HERS-verified maximum fan efficacy of 1.0 Watts per cfm for heat recovery ventilation (HRV) and energy recovery ventilation (ERV) systems. § 160.2(b)2Biii
 - Adds mechanical acceptance testing requirements. § 160.3(d)2
 - Adds electric-ready requirements when gas equipment is installed for space heating, cooking, and clothes dryers. § 160.9(a-c)

For additional help with the Energy Code see Energy Code Ace's **online offerings** of trainings, tools, and resources.



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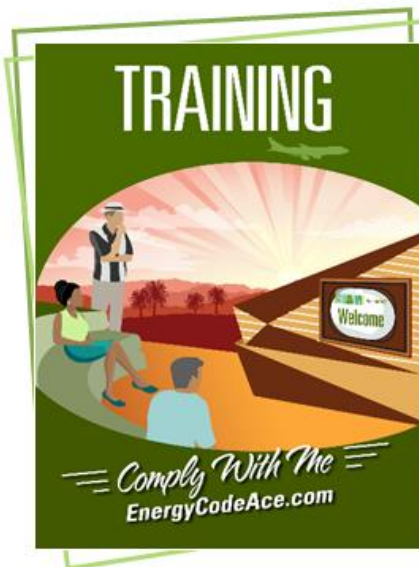


Energy Code Ace



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




Resources provide quick, useful guidance:

- ✦ Fact Sheets
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- ✦ Trigger Sheets
- ✦ Useful Links

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Codes and Standards

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- Free ICC-approved training sessions for 2022 Energy Code (Title 24, Part 6) requirements → www.iren.gov/161/CS-Trainings
- Requested training courses can also be scheduled

C&S Technical Support Program

Request Free Technical Assistance from Local Code Experts—Reach Code Development, Permit Guides, Etc. → www.iren.gov/162/CS-Technical-Support

Ask a Code Mentor an Energy Code Question

Submit queries online and receive a personalized response addressed by energy code experts within two business days! → www.iren.gov/162/CS-Technical-Support



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