

This document outlines proposed amendments to the 2024 International Energy Conservation Code - Residential Provisions, focusing on enhancing energy efficiency and reducing carbon emissions in residential buildings. These provisions apply to detached one- and two-family dwellings, multiple single-family dwellings (townhomes), and three-story or less multifamily structures.

Key areas of amendment include:

- **Waivers (R111):** Provisions are included for waivers from certain requirements in cases of natural disasters or substantial cost differentials for large commercial buildings (over 10,000 sq ft) where compliance would exceed 1% of total mechanical, electrical, and plumbing construction costs. **CCOB has amended out the waiver for substantial cost differentials with the Electric Ready and Solar Ready code adoption in place and will maintain this with the new adoption - this is considered a strengthening amendment.**
- **Definitions (R202):** New definitions are introduced for terms crucial to energy efficiency, such as various types of Electric Vehicle (EV) readiness (e.g., EV Ready Space, EVSE Installed Space), different levels of Electric Vehicle Supply Equipment (EVSE), Combustion Equipment, Fuel Gas, Fuel Oil, Future Electric Equipment, Lighting Zones (LZ0-LZ4), Luminaire, and Solar-Ready Zone.
- **Compliance Pathways:** The document details compliance options for residential buildings based on conditioned floor area, including Prescriptive, Simulated Building Performance, and Energy Rating Index (ERI) options. It also specifies compliance targets for simulated building performance based on dwelling unit size and the presence of combustion equipment.
- **Building Thermal Envelope (R402.5.1.3):** Amendments address air leakage rates for buildings and dwelling units, with varying maximum rates depending on climate zone and compliance pathway.
- **Demand Response (Section R403.5.4):** New section mandates demand-responsive controls for electric storage water heaters (40-120 gallons,  $\leq 12$  kW), enabling them to adjust operation in response to demand signals.
- **Simulated building performance (Section R405.2):** Added table to increase energy compliance based on sizes of dwelling units - <5,000 s.f., 5,000 to less than 7,500 s.f., Dwelling units that are 7,500 s.f. or larger need to comply with Appendix RC, which requires net zero rating and includes on-site renewable energy. The definition of floor area is also modified to include all conditioned space, which will now include conditioned finished or unfinished basements
- **ERI compliance (section 406.2/ R408):** This section requires a more efficient ERI rating for all size dwelling units and this compliance pathway requires a house with 7,500 s.f. or greater to comply with Appendix RC, which would require the house to have a net zero rating, which includes providing on-site renewable energy. There are credits for installing ground source heat pumps or not installing any combustion equipment (gas appliances).
- **Energy Efficiency Credits (Section R408):** This section is dedicated to a credit system for achieving additional energy efficiency. This includes:

- **Credit Requirements:** Specifies the number of credits required based on conditioned floor area and outlines that credits must be earned from at least two different measures. Added requirement for dwelling units that are 7,500 s.f. or larger need to comply with Appendix RC, which requires the dwelling units to be net-zero rating
- **Credit Measures:** A detailed table (Table R408.2(2)) lists various energy efficiency measures and their corresponding credit values across different climate zones. These measures cover areas such as:
  - Building Thermal Envelope improvements (e.g., total thermal conductance reduction, improved fenestration, reduced air leakage).
  - HVAC equipment performance (e.g., ground source heat pumps, high-performance furnaces, boilers, and heat pumps, evaporative cooling).
  - Service Water Heating (e.g., various types of gas-fired, electric, and solar water heaters, compact hot water distribution).
  - Thermal Distribution Systems (e.g., ductless/hydronic systems, ductwork in conditioned space, reduced duct leakage).
  - Ventilation systems (e.g., ERV/HRV installation, reduced air changes per hour with ventilation).
  - Appliances (energy-efficient refrigerators, dishwashers, clothes washers, and dryers).
  - On-site renewable energy.
  - Demand-responsive thermostats, whole-home lighting control, and higher efficacy lighting.
  - New measures like BUG Ratings for exterior lighting, roof and gutter deicing controls, and refrigerants with low global warming potential (GWP).
- **Residential Electric Ready, Solar Ready, and EV Ready (Section R409):** This new section integrates the currently adopted Electric Ready and Solar Ready code, which is already adopted by Broomfield. It includes comprehensive requirements for preparing residential buildings, including multifamily 3 stories or less for future electrification, solar energy, and electric vehicle charging.
  - **Electric Ready:** Mandates dedicated branch circuits, appropriately sized electrical panel space, and proper labeling for future electric equipment for space heating, water heating, cooking, and clothes drying, where combustion equipment is currently installed. It also requires provision for condensate drainage.
  - **Solar Ready:** Outlines requirements for a designated solar-ready zone on roofs of multi-family buildings three stories or less, single-family homes and townhouses, including construction document specifications.
  - **EV Ready:** Specifies requirements for EV-ready spaces, including conduit, raceway, electrical panel capacity, wiring, receptacles, and circuit overprotection devices for future EV charging installations.

- **EV capable light spaces** - added exception to allow a conduit with pull string to a location of a future transformer or future electrical panel with service size determined at time of future permit.
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The document aims to provide a comprehensive framework for promoting higher energy efficiency and reducing carbon footprints in residential constructions through a combination of prescriptive measures, performance-based compliance options, and a system of energy efficiency credits. Based on the numerous amendments to encourage the use of non-combustion equipment, this code can be considered as an electric preferred code