

Title 24 2013 Standards

CABEC Conference

2013 Building Energy
Efficiency Standards
Update

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Efficiency Standards

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Authority & Process

Public Resources Code (PRC 25402): Reduction of wasteful, uneconomic, inefficient or unnecessary consumption of energy

- (a)(1) Prescribe, by regulation, lighting, insulation climate control system, and other building design and construction standards that increase the efficiency in the use of energy and water...

- Residential and Nonresidential Building Standards first adopted in 1978 and updated every three years
- The Standards are demonstrated to be cost effective
- The Standards include mandatory performance requirements with alternative prescriptive requirements
- The Standards are developed in an open public process

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2013 Standards Update Schedule - Revised

Aug 23, 2011	Last Pre-Rulemaking Workshop	
Sep 30, 2011	Draft Express Terms	
Oct 20, 2011	Impact Analyses for EIR	
Oct 13-14, 2011	Efficiency Committee Workshop(s)	
Nov 3, 2011	Rulemaking Package: Express Terms, ISOR, NOPA, EIR, 399	
Nov 3, 2011	399 filing to DoF	
Dec 8, 2011	NOPA Package filing to CBSC	
Dec 30, 2011	Publish Express Terms . 45 day language & EIR	
Jan 9-13, 2011	Efficiency Committee Hearing(s)	
Feb 27, 2011	Commissioner Briefings	
Mar 7, 2012	Business Meeting . 45 day language	Title 24 2013
Mar 14, 2012	Publish Express Terms . 15 day language	Standards
Apr 4, 2012	Business Meeting . Adoption	



Standards Development Public Review

- Convened more than 45 Industry stakeholder groups over the last year to inform them of potential changes to the standards and to consider their input
- Held 15 Workshops
- Responded to more than 1000 public comments

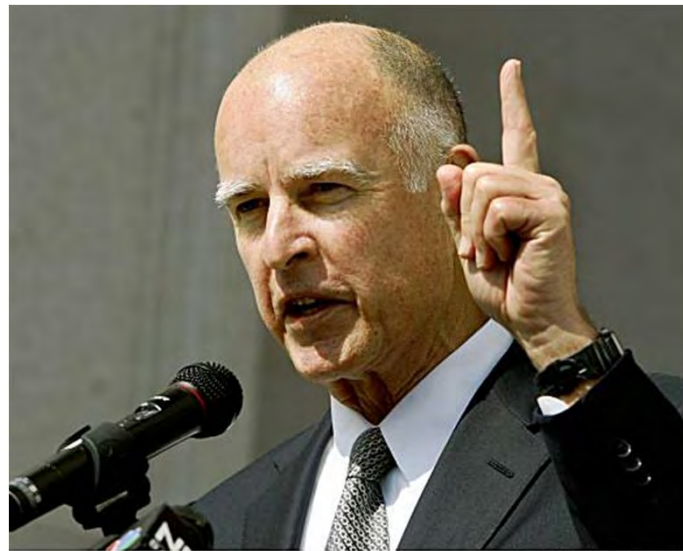


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Policy Drivers

- Governor's "Clean Energy Jobs Plan"
- Zero Net Energy: Residential by 2020 and Nonresidential by 2030
- CARB Climate Change Scoping Plan
- California Long Term Energy Efficiency Strategic Plan



Paul Chinn / The Chronicle

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More Efficient Buildings...

Require the manufacturing, design, installation, monitoring and maintenance of efficient systems and technologies, resulting in:

- Green Job Creation
- Higher Paying Jobs
- Investment By Entrepreneurs
- Global Competitiveness

“Most new jobs should and will be created in the private sector, but government can play an important role in establishing a favorable climate for job creation.” *Governor Jerry Brown*



New Efficiency Standards for New Buildings

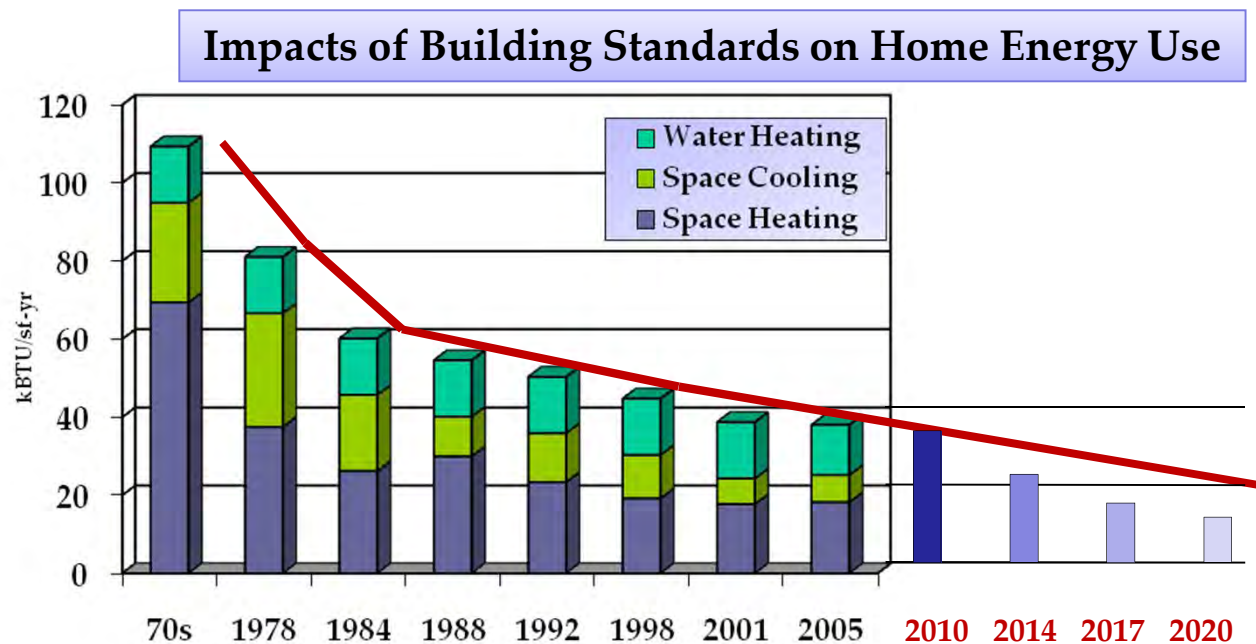
- Design new more efficient buildings that use half the energy they use today
- Establish a plan and timeline to make new homes and commercial buildings “Zero Net Energy”
- Build 12,000 Megawatts of Localized Electricity Generation
(from onsite renewable sources)

“Energy Efficiency is the cheapest, fastest, and most reliable way to create jobs, save consumers money and cut pollution from the power sector.” *Governor Jerry Brown*



Zero Net Energy Standards

- Need to accelerate energy savings from building components regulated under Title-24
- Integrate onsite generation into building code to accomplish ZNE



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2013 Standards Highlights

- First update to reflect Zero Net Energy goals
- 25 to 30% on Residential Improvements
- 15 to 20% Nonresidential Improvements
- Photovoltaic in code for the first time as compliance option
- Supermarkets, Parking Garages, Commercial Kitchens, and laboratory Hoods covered for the first time by Title 24

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2013 Standards

General Updates

1. Renumbering the Standards subchapters and going to the decimal system, for example 150 becomes 150.0 and 151 becomes 150.1 – all other conventions stay the same.
2. Introduce option for enforcement agencies to create simplified compliance documents –this was requested by CALBO, and will apply to alterations and additions less than 300 sqft. that do not have a HERS verification requirement.
3. Require registration of all nonresidential compliance documents by January 1, 2015 –the 1-year delay is to allow time to prepare the infrastructure needed for the nonresidential registration procedures.
4. Introduce a document repository feature into the electronic documentation registration procedures –when documents are registered in a HERS data registry or a nonresidential data registry, a copy of each document will be archived in an electronic document repository.



2013 Standards

Residential Measures

Mandatory Requirements

1. Duct sealing in all climate zones.
2. Establishes the mandatory requirement to either a) size return ducts and filter grills in accordance with prescriptive tables 150.0-A and B, otherwise b) the duct system shall comply with fan watt draw requirements of 0.58 Watt/cfm at a cooling coil airflow rate of 350 cfm/ton. This requirement does not apply to all HVAC alterations.
3. Bypass ducts will no longer be allowed.
4. All nonrecirculating hot water piping of nominal diameter $\frac{3}{4}$ inch (19 mm) or larger must be insulated.
5. The maximum length of 1 inch (25 mm) piping in a non-recirculating domestic hot water distribution system shall be limited to a total length of 15 feet (4.5 m) –Exception for pipes dedicated for tubs
6. Upgradable Setback Thermostats to allow occupant to participate in utility Demand Response programs.
7. Numerous clarifications to Section 150.0(k) – mandatory lighting requirements



2013 Standards

Residential Measures

Mandatory Requirements – Solar Zone

8. Solar zone is a portion of the roof designated and reserved for the future installation of a solar electric or solar thermal system
9. 70% of single family residences in subdivisions with ≥ 10 homes AND tentative subdivision map deemed complete on or after January 1, 2014
 - Solar zone = 250 SF
 - If 3 stories or $>$ and total area ≤ 2000 SF, solar zone = 150 SF
 - Not required for additions/alterations unless there is an existing solar zone
10. Solar zone is oriented between 150° - 270° or on flat roof
11. Labeling of air filter grills -specifies requirements for labeling of filter grills for design airflow rate and design pressure drop to assist homeowner in selection of correct replacement air filter products.
12. Pressure drop –specifies use of air filters that perform at a maximum clean filter pressure drop of 25 Pa (0.1 inches water), as rated using AHRI Standard 680.
13. Fenestration products must have a maximum U-factor of 0.57 - New

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2013 Standards

Residential Measures

Prescriptive Measures

1. High performance windows – U-factor 0.32 and SHGC 0.25 in all CZs
2. Quality Insulation Installation in CZs 1-5 and 11-16
3. Roof deck insulation – R4 above deck or R13 below deck in CZs 9-15
4. Improved wall insulation – R21/4 in CZs 1 and 11-16; R15/4 in all other CZs
5. Night Ventilation – in climate zones 8-14
6. Increase duct insulation to R-6 in CZs 6-8, no more R4.2 in the state
7. Requiring radiant barriers in all CZs including 3, and 5-7



2013 Standards

Residential Measures - Continued

Prescriptive Measures

8. For systems serving individual dwelling units, electric-resistance water heating may be installed as the main water heating source only if natural gas is unavailable and only if the water heater is located within the building envelope and a minimum of 50 percent of the annual energy for water heating is provided by a passive or active solar water-heating system.

9. Mini-splits and multi-splits that cannot meet HERS verification requirements for refrigerant charge - Add requirements for increased efficiency and weigh-in refrigerant charge installation certificate documentation for air conditioner and heat pump equipment that cannot meet either the standard charge verification procedure in RA3.2 or an alternative special case procedure from RA1. The higher minimum efficiency are not required to be met if the system is a ductless system.



2013 Standards

Residential Measures

Compliance Options

- Solar photovoltaic and high efficacy lighting to allow flexibility in compliance without sacrificing the envelope efficiency
- Compliance credit for all high efficacy lighting system

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2013 Standards

Residential Additions and Alterations

- Exception 1 to 150.2(a) Clarifies that for additions less than 1000 square feet, mechanical ventilation for whole-building ventilation airflow is not required; however, all other applicable requirements of ASHRAE 62.2 still apply to additions less than 1000 square feet.
- EXCEPTION to Section 150.2(b)1B;Glazing Properties. Replacement fenestration up to a total area of no more than 50 square feet with a U-factor no greater than 0.40 and in climate zones 2, 4, and 6-16, a SHGC value no greater than 0.40.
- Added the same requirements for systems such as mini-splits and multi-splits that cannot comply with refrigerant charge verification requirements as is required in prescriptive Section 150.1(c)7, including the weigh-in method requirements and the higher SEER and EER requirements

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Additions and Alterations – Performance Approach

1. For ceiling, roof, walls, and floors provide partial credits for altered components that exceed mandatory requirements. Provides full credit if 2013 prescriptive requirements are met.
2. For windows provide partial credits for altered components that exceed the 2008 prescriptive requirements for U-factor and SHGC. Provides full credit if 2013 prescriptive requirements are met.

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2013 Standards

Nonresidential Measures: § 120.2 (122)

REQUIRED CONTROLS FOR SPACE CONDITIONING SYSTEMS

(c) Operation and Control Requirements for Minimum Quantities of Outdoor Air

- Added occupant sensor ventilation control device as type of control suitable for demand control ventilation
- New requirements for functionality and installation of occupant sensor ventilation control devices

(e) Shut-off and Reset Controls for Space-conditioning Systems

- Added requirement to setup / setback temp setpoints by 2 deg F and reset ventilation rate to zero for unoccupied class, conference and multipurpose rooms

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2013 Standards

Nonresidential Measures: § 120.2 (122)

REQUIRED CONTROLS FOR SPACE CONDITIONING SYSTEMS

- (f) Economizer Fault Detection and Diagnostics (FDD) **NEW**
- All economizers for air-cooled, unitary DX units are required to have FDD system
 - FDD system requirements specified in NA9

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2013 Standards

§ 120.5 (125)

REQUIRED NONRESIDENTIAL MECHANICAL SYSTEM ACCEPTANCE

- Factory installed economizers do not need acceptance testing
- New acceptance tests for supply air temperature reset and condenser water reset controls

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2013 Standards

§ 120.6 (126) and 140.9

MANDATORY AND PRESCRIPTIVE REQUIREMENTS FOR COVERED PROCESSES

1. Updated requirements for refrigerated warehouses
2. New Mandatory Requirements for Commercial Refrigeration
3. New Mandatory Requirements for Commercial Refrigeration
4. New Mandatory Requirements for Enclosed Parking Garages
5. New Mandatory Requirements for Commercial and Process Boilers
6. New Mandatory Requirements for Compressed Air Systems > 25 hp



§ 120.7 (NEW)

Mandatory Insulation Requirements for Nonresidential Buildings

- “ Newly constructed building in a nonresidential, high-rise residential, and hotel/motel buildings shall meet the minimum requirements in this Section.
- “ Roof Insulation
 - . Metal buildings weighted average U-factor not exceeding 0.065
 - . Wood framed weighted average buildings U-factor not exceeding 0.075
- “ Wall Insulation
 - . Metal building weighted average U-factor not exceeding 0.113
 - . Metal framed weighted average U-factor not exceeding 0.098
 - . Mass wall U-factor not exceeding 0.44
 - . Wood framed weighted average buildings U-factor not exceeding 0.110
- “ Floor Insulation -assembly shall not exceed the U-factor of U-0.071



2013 Standards

§ 140.3 (143)

Nonresidential Prescriptive Envelope Requirements

Nonresidential Fenestration

1. Vertical Fenestration - For Nonresidential Buildings, Area-Weighted Performance Rating a U-factor (for fixed windows) no greater than 0.36, RSHG no greater than 0.25 and VT no less than 0.42 (partial listing, see Section 143(a) for other windows types and high-rise residential occupancy) Increased low-slope cool roof requirements
2. Skylights - For Nonresidential Buildings, Area-Weighted Performance Rating a U-factor (for glass curb mounted skylights) no greater than 0.58, RSHGC no greater than 0.25, and VT no less than 0.49 (partial listing, see Section 143(a) for other skylights types and high-rise residential occupancy)



2013 Standards

§ 140.3 (143)

Nonresidential Daylighting Requirements

- “ 8,000 ft² threshold changed to > 5,000 ft²
- ≥ 50% floor area in the skylit daylight area changed to:
- ≥ 75% floor area within one head height from windows or within 0.7 times average ceiling height from the edge of rough opening of skylights
- Minimum Skylight Area or Effective Aperture no longer needed

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2013 Standards

§ 140.3 (143)

Nonresidential Cool Roof Requirements

Section 140.3(a)1 -Roofs

- Nonresidential Steep-sloped roofs in climate zones 2 through 16 shall have a minimum aged solar reflectance of 0.20 and a minimum thermal emittance of 0.75, or a minimum SRI of 16.
- “ Low-sloped roofs in climate zones shall have a minimum aged solar reflectance of 0.67 and a minimum thermal emittance of 0.75, or a minimum SRI of 80.

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2013 Standards

140.6 (146)

Nonresidential Indoor Lighting Measures

- TABLE 140.6-A –Lighting Power Adjustment Factors (PAF)
- TABLE 140.6-B –Complete Building Method LPD Values W/ft²
- TABLE 140.6-C –Area Category Method LPD Values W/ft²
- TABLE 140.6-D –Tailored Method Lighting Power Allowances
- TABLE 140.6-E –Mounting Height Adjustments
- TABLE 140.6-F –Room Cavity Ratio (RCR) Equations
- TABLE 140.6-G –Illuminance Levels (LUX) LPD

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2013 Standards

140.7 (147)

Nonresidential Outdoor Lighting Measures

- “ Edited for clarity
- Some LPDs reduced
- Additional Lighting Power Allowance for local ordinance removed

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2013 Standards

Nonresidential Measures

Mechanical

- Packaged units down to 6 tons must be Variable Air Volume with the ability to modulate cooling capacity to 20% of max.
- Increased cooling tower energy and water efficiency
- Extended economizer requirements to smaller capacity cooling systems

Commissioning

- Required for installation of energy-related building components
- Design phase commissioning required

Solar Ready

- Mandatory requirements to establish a reserved solar zone for buildings 3 stories or less

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Reach Standards for Title 24

Paving the Road Through Voluntary Compliance

- Voluntary energy efficiency codes based on Title 24 (Part 6) for the California Green Building Standards (Title 24, Part 11)
- “Reach Standards” are more stringent codes developed to facilitate the transition to Zero Net Energy buildings
- “Reach standards” signal to the market how building standards will advance over time, allowing the industry to adapt and innovate to meet future requirements
- Consistent with the reduction targets for future Title 24 updates
- “Reach Standards” can be adopted by local jurisdictions



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Reach Standards for Title 24

Part 11 – Residential Voluntary

- Tier I: 15% beyond Title 24, Part 6
- Tier II: 30% beyond Title 24, Part 6
- Prerequisites:
 - HERS “Design Rating” - whole building HERS rating (only rating, no measure recommendations) without all requirements of HERS Whole House rating (for existing homes, which includes recommendations)
 - Quality Insulation Inspection
 - High Efficacy lighting – with hard wired lighting & occupancy controls in all functional areas, plus ENERGY STAR light kits in all ceiling fans
- Energy budget cap for electricity consumption equivalent to 10,000 kWh/yr

Part 11 – Nonresidential Voluntary

- Tier I: 10% beyond Title 24, Part 6
- Tier II: 20% beyond Title 24, Part 6



Reach Standards for Title 24

Early
Adopters

Daly City	San Francisco
San Jose	Fremont
Santa Rosa	Los Altos
Marin	Sebastopol
Simi Valley	Tiburon
Beverly Hills	Palo Alto
Portola Valley	W. Sacramento
Sonoma City	Mountain View
Stockton	San Anselmo
San Carlos	Petaluma
Pacifica	Goleta
Hayward	San Rafael
Santa Clara	San Mateo
Belmont	Morgan Hill
Oakland	Sonoma
Union City	Cotati
Malibu	Redwood City
Richmond	Manhattan Beach
Napa	Windsor

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Questions?

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