



CALIFORNIA ENERGY COMMISSION

Title 24

Building Energy Efficiency

Standards

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History of Building Standards

- California Legislature through the Warren-Alquist Act created CEC. Gov. Reagan signed the legislation that created the CEC in 1974. Gov. Brown funded it in 1975. WAA required Building Energy Efficiency Standards and updates to standards., and required building departments to enforce them through the permit process.



History of Building Standards

- First Building Standards were adopted in 1978
- Standards have been updated roughly every three to four years
- More recently, the Standards have been updated in 1992, 1998, 2001, and 2005
- The next update is scheduled for adoption in early 2008. The effective date is expected to be mid 2009.



How Standards Are Updated

- Standards operate under the Efficiency Committee, which currently consists of Chairman Jackalyne Pfannenstiel and Commissioner Arthur Rosenfeld
- Staff, its consultants, and the utility partners write Triennial Standards update
- The updates are presented to the public in staff workshops and committee hearings
- All public comments are processed and responded to



How Standards are Updated – Cont'd

- Input from the public, including designers, architects, energy consultants, builders, utilities, equipment manufacturers, building officials, environmentalists, scientists, engineers, and others
- Life cycle costing (LCC) must be done for items adopted



How Standards are Updated – Cont'd

- For the 2005 standards, 19 public workshops and hearings were held – hundreds participated
- 2008 Standards workshops got underway in October of 2005
- Staff has held public workshops in October 2005, February 2006, March 2006, May 2006, July 2006, February 2007, and July 2007, many were two-day events



Support and Outreach

- Residential and Nonresidential Compliance Manuals development and distribution which interpret the Standards
- Hotline for questions on Standards
- Facilitates training sponsored by utilities (usually starting about 3-6 months before the new effective date of Standards)



Training and Outreach – Cont'd

- Blueprint newsletter (now online and e-mailed only) – answers commonly asked questions about the Standards
- Videos at – <http://www.energyvideos.com> and <http://www.energy.ca.gov/title24/changeout/index.html>



Standards Compliance

- Building Standards are enforced by the local building officials
- Enforcement may involve third party verifiers such as HERS Raters for particular measures such as duct sealing and TXVs

Compliance Methods:

- Buildings must comply with mandatory measures and with either the prescriptive or performance compliance approaches (basically an energy “budget” for each building referenced to specific climate zone – 1 of 16 zones)



Standards Compliance – Cont'd

- Mandatory Measure – All buildings must comply with mandatory measure regardless of compliance path
- Prescriptive Compliance – Compliance through prescriptive packages which varies with climate zones – no tradeoffs allowed
- Performance Approach – Use an approved compliance software to demonstrate compliance for the entire building – allows tradeoffs
- Compliance Options – Measures that are not required prescriptively but can result in a compliance credit if installed, such as high EER air conditioning and gas cooling



Policy Goals

- Energy Action Plan / IEPR
 - Efficiency at the top of the Loading Order
 - Demand Response
 - Encourage PVs in the Standards
 - Combined Energy and Water Efficiency
- West Coast Governors' Global Warming Initiative
 - 15% efficiency savings through State Building Codes by 2015



Policy Goals

- Green Building Initiative
(Exec Order S-20-04)
 - 20% increase in Nonresidential Standards by 2015
- Climate Action Initiative
(Exec Order S-3-05)
 - Standards must help to meet Greenhouse Gas Emissions Reduction Goals
 - 2000 levels by 2010
 - 1990 levels by 2020



Major Collaboration

- PIER Focused Research
 - Views Standards as a primary delivery mechanism
 - Substantial Research for 08 Standards
- PGC-funded Codes and Standards
 - CASE Initiatives by PG&E, Edison, Sempra
- Public process with active stakeholder input



Updated Schedule for 2008 Standards

Public workshops on potential changes	Oct '05 to Jul '06
Reconcile comments in preparation for draft regulation workshops, including analysis rework and markup of the Standards documents	July '06 to Jan '07
Public workshops on marked-up draft Standards, ACM manuals, and Joint Appendices	Feb '07 to Jun '07
Incorporating the comments from workshops into the Standards documents, preparing rulemaking documents	Jul '07 to Sep '07
Formal rulemaking	Oct '07 to Dec '07
Adoption	January 2008



Updated Schedule for 2008 Standards – Cont'd

<p>Compliance manuals and compliance software developed and approved.</p> <p>Statute says Standards can go into effect no sooner than six months after certification of the compliance manuals (allow nine months for both the compliance manuals and compliance software).</p>	<p>Feb 08 to Nov 08</p>
<p>Tentative Effective date of the Standards.</p>	<p>April 09</p>



Changes Considered for 2008 Standards

[http://www.energy.ca.gov/
title24/
2008standards/
documents/
index.html](http://www.energy.ca.gov/title24/2008standards/documents/index.html)



Changes Considered for 2008 Standards Affecting Residential

- New Solar Home Partnership (NSHP) Compliance Option for buildings with PVs
- Better modeling of roofs and attics
- New window requirements
- Updated lighting requirements, including lighting controls and kitchen lighting
- Mechanical ventilation requirements and indoor air quality (IAQ) modeling
- Updated swimming pool and spa requirements



Changes Considered for 2008 Standards Affecting Residential

- New furnace fan efficiency, airflow, and fan watt draw
- Requirements for air conditioning refrigerant charge and revised airflow and TXV treatment
- Revisions to ACM Manual calculations for slab heat-flow and furnace fan modeling
- Updated requirements for duct leakage



Changes Considered for 2008 Standards Affecting Residential

- Improved controls for central hot water distribution systems in multifamily buildings
- Under-slab hot water pipe insulation requirements
- Revised modeling of Tankless gas water heaters
- Revised modeling of PEX parallel piping hot water distribution systems



Changes Considered for 2008 Standards Affecting Both Residential and Nonresidential

- Demand Response (programmable communicating thermostats - mostly residential)
- New Cool Roof requirements for steep-sloped roofs
- Changes to Joint Appendix 4 wall, roof, floor assemblies
- Updated Time Dependent Valuation (TDV)
- Refinements to additions and alterations



Changes Considered for 2008 Standards Affecting Nonresidential

- Updates to indoor lighting mandatory and prescriptive requirements including Tailored Method, display Lighting Power Densities (LPDs) based on metal halide
- Add new area categories for indoor lighting
- Demand response controls for indoor lighting
- Updates to outdoor lighting mandatory and prescriptive requirements



Changes Considered for 2008 Standards Affecting Nonresidential

- Updates to sign mandatory and prescriptive requirements
- Updates to lighting control schedules based on new TDV multipliers
- Add requirements for occupant sensors in new areas
- Updates for compliance for side-lighting and day-lit areas near windows
- Updates to skylights requirements including controls and ceiling heights
- Changes to site-built fenestration requirements including NFRC certification, default values, and modeling rules



Changes Considered for 2008 Standards Affecting Nonresidential

- Revised Cool Roof requirements for low-slope roofs
- Revised Roof, wall and floor insulation requirements
- Revised Overall building envelope requirements – simplified trade-offs for retrofits/alterations
- Refinement of the acceptance requirements for HVAC and indoor lighting
- New acceptance requirements for envelope and outdoor lighting
- New requirements for single-zone variable air volume (VAV) equipment
- New requirements for refrigerated warehouses



Changes Considered for 2008 Standards Affecting Nonresidential

- Expand direct digital control systems to zone level for HVAC systems, including demand shedding controls, hydronic pressure reset, VAV zone minimums, demand control ventilation, and supply air temperature reset
- New Global temperature adjustment requirement (demand response)



Changes Considered for 2008 Standards Additional Compliance Options

Residential Compliance Options

- Evaporative Coolers

Nonresidential Compliance Options

- Under Floor Air Distribution Systems
- Fault detection and diagnostics for air handler units, VAV, and rooftop units
- Displacement Ventilation



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Thank You