

CALIFORNIA ENERGY COMMISSION

1516 Ninth Street Sacramento, California 95814

Main website: www.energy.ca.gov**NOTICE OF PROPOSED ACTION****REVISIONS TO THE CALIFORNIA BUILDING
ENERGY EFFICIENCY STANDARDS
CALIFORNIA CODE OF REGULATIONS, TITLE 24, PART 1 and PART 6
(CALIFORNIA ENERGY CODE)****2013 BUILDING ENERGY EFFICIENCY STANDARDS
California Energy Commission
DOCKET NO. 12-BSTD-1
FEBRUARY 7, 2012**

Notice is hereby given that the California Energy Commission proposes to adopt changes to the Building Energy Efficiency Standards contained in the California Code of Regulations (CCR), Title 24, Part 6 (also known as the California Energy Code) and associated administrative regulations in Part 1. The proposed amended standards are called the "2013 Building Energy Efficiency Standards" and will go into effect in 2014.

The Energy Commission has prepared this Notice of Proposed Action (NOPA) and an Initial Statement of Reasons (ISOR) regarding the need for the proposed revisions. The Energy Commission has also published the Express Terms (45-Day Language) of the proposed amendment language. These documents can be obtained from the contact persons designated below or from the Energy Commission website at: www.energy.ca.gov/title24/2013standards/rulemaking/.

PUBLIC COMMENT PERIOD AND HEARINGS

The Energy Commission's Energy Efficiency Commissioner will hold public hearings to receive public comments on the proposed action. At these hearings, any person may present statements or arguments relevant to the proposed regulatory action summarized below. The proposed language (45 Day Language Express Terms) is posted on the Energy Commission's website at: www.energy.ca.gov/title24/2013standards/rulemaking/.

The 45 Day Language Express Terms are also available from the Energy Commission's High Performance Buildings and Standards Development Office (contact persons are listed later in this NOPA). The Commissioner Hearings to discuss the 45-Day Language are scheduled as follows:

MONDAY, MARCH 12, 2012
TUESDAY, MARCH 13, 2012 (if needed)
THURSDAY, MARCH 15, 2012 (If needed)

9:00 a.m.

CALIFORNIA ENERGY COMMISSION
Hearing Room A
1516 Ninth Street
Sacramento, California
(Wheelchair Accessible)

The Commissioner Hearing will definitely be held on the first date listed. The Commissioner Hearings may continue on the second and third dates listed, as necessary.

Audio for the Energy Efficiency Commissioner Hearings will be broadcast over the Internet. For details, please go to: www.energy.ca.gov/webcast.

If you have a disability and require assistance to participate in these hearings, please contact Lou Quiroz at (916) 654-5146 at least 5 days in advance.

A hearing before the full Energy Commission, for possible final adoption of the 45 Day Language Express Terms will be held on the date below; however, if the Energy Commission decides to make substantive changes to the Express Terms through 15 Day Language, the public hearing may be continued to a later noticed date.

PROPOSED ADOPTION DATE – FULL ENERGY COMMISSION HEARING

WEDNESDAY, APRIL 11, 2012

10 a.m.

CALIFORNIA ENERGY COMMISSION
Hearing Room A
1516 Ninth Street
Sacramento, California
(Wheelchair Accessible)

Audio for the April 11, 2012 ENERGY COMMISSION HEARING will be broadcast over the Internet. For details, please go to: www.energy.ca.gov/webcast.

If you have a disability and require assistance to participate in these hearings, please contact Lou Quiroz at (916) 654-5146 at least 5 days in advance.

If the Energy Commission decides to propose 15 Day Language modifications to the Express Terms, a separate notice of the adoption hearing for the 15 Day Language will be provided.

The public comment period for this NOPA will be from February 24, 2012, through 10:00 a.m. on April 11, 2012. Any interested person may submit written comments on

the proposed amendments. Regarding the Energy Efficiency Commissioner and Adoption Hearings, the Energy Commission appreciates receiving written comments at the earliest possible date: for the March 12, 2012 hearing, please provide written comments by March 6, 2012; for the April 11, 2012 Adoption Hearing, please provide written comments by April 4, 2012. However, written comments will still be accepted at the adoption hearing if they are received by 10:00 a.m. on April 11, 2012. Written comments must be emailed to Docket@energy.ca.gov or mailed or delivered to the following address (emailing is preferred):

CALIFORNIA ENERGY COMMISSION
Attention: Docket No. 12-BSTD-1
Dockets Office
1516 Ninth Street, MS-4
Sacramento, CA 95814

All written comments must contain the official number of the proceeding “Docket No. 12-BSTD-1,” prominently displayed on the first page. When comments are emailed on behalf of an organization, the comments should be a scanned copy of the original on the organization’s letterhead and include a signature of an authorized representative.

Written Comments may also be filed electronically by emailing ryasny@energy.ca.gov or FAXing them to (916) 654-4304, as long as they are received no later than April 11, 2012 at 10:00 a.m.

Oral comments may be made at the Energy Efficiency Commissioner hearing(s) (March 12, and March 13 and 15 if necessary). In addition, oral comments may be made at the April 11 Full Commission Adoption Hearing. **The Commission requests that oral comments be limited to summaries of previously-submitted written comments.**

POTENTIAL POST-HEARING MODIFICATIONS TO THE TEXT OF THE REGULATIONS

Interested persons should be aware that any of the provisions of the amendments under consideration by the Energy Commission could be substantively changed as a result of public comment, staff recommendations, or discussions at the Energy Efficiency Commissioner or Full Commission Hearings. If the Energy Commission makes substantive changes to the 45 Day Language Express Terms that a reasonable person could have anticipated could be made as within the scope of this NOPA, it will make the full text of the modified amendments available to the public at least 15 days before adoption, as required by Government Code 11346.8. (Changes outside the scope of the NOPA must be made in new 45 day language.)

To be notified of any modifications, you must submit written oral comments in accordance with the instructions above, or request that you be notified of any modifications, by submitting a request, no later than April 9th, to:
ryasny@energy.ca.gov.

AUTHORITY AND REFERENCE

The Energy Commission proposes to adopt the Express Terms under the authority granted by Public Resources Code Sections 25213, 25402(a)-(b), 25402.1, 25402.4, 25402.5, 25402.8 and 25910.

INFORMATIVE DIGEST

A. Summary of Existing Laws and Regulations; Policy Overview

Public Resources Code Sections 25402 and 25402.1 were enacted in the 1970s as part of the enabling legislation establishing the Energy Commission and its basic mandates. These sections require the Energy Commission to adopt, implement, and periodically update energy efficiency standards for both residential and nonresidential buildings. In addition, Public Resources Code Section 25910 directs the Commission to adopt standards for the minimum amount of additional insulation installed in existing buildings. Senate Bill (SB) 639 (Statutes of 1993) added Section 25402.5, which expressly directs the Commission to consider both new and replacement, and both interior and exterior, lighting devices when adopting building standards. SB 5X (Statutes of 2001) added subsection (c) to Section 25402.5 to clarify and expand the Commission's authority to adopt standards for outdoor lighting.

The Global Warming Solutions Act (Assembly Bill (AB) 32, Núñez, Chapter 488, Statutes of 2006) has been the foundation of California's efforts over the past five years to reduce greenhouse gas emissions (GHG); AB 32 requires that by 2020 the state reduce its GHG emissions to the level that existed in 1990. *Improving the energy efficiency of existing residential and commercial buildings is the single most important activity to reduce greenhouse gas emissions that result from electricity and natural gas use.* The Energy Commission's 2007 Integrated Energy Policy Report (IEPR), which is California's official statement of the state's energy policy, concludes that climate change is the single most important environmental and economic challenge of the century, that greenhouse gas emissions are the largest contributors to climate change, and that and California's ability to slow the rate of greenhouse gas emissions will depend first on energy efficiency.

Similarly, the California Long-Term Energy Efficiency Strategic Plan (2008) adopted by the California Public Utilities Commission (CPUC) identifies the importance of the Energy Commission's building energy efficiency standards in reaching the State's goal of having new homes be "zero net energy" by 2020 and of having commercial buildings be "zero net energy" buildings by 2030. ("Zero net energy" means that the buildings would be so energy efficiency, and would where necessary have on-site energy production facilities (such as solar photovoltaic electricity-generating panels on rooftops), that the buildings would produce as least as much energy as they consumed from electricity and natural gas utility service.) The CPUC's Strategic Plan also discusses the Energy Commission's development of voluntary "Reach Standards" as a critical component of the Building Energy Efficiency Standards. In each update of the mandatory standards, the Reach Standards establish a "market

pull strategy” to encourage the building industry to anticipate that additional standards improvements will be coming in the following cycle, and for a substantial portion of newly constructed buildings to build to meet higher levels of efficiency than just what the mandatory standards require. This is accomplished by the Energy Commission’s collaboration with the CPUC and with utility programs that provide incentives to builders who meet the Reach Standards. The voluntary Reach Standards appear in the State’s California Green Building Standards Code (California Code of Regulations, Title 24, Part 11) and in other agencies’ regulations and programs.

Governor Brown’s Clean Energy Jobs Plan (2010) combines existing state energy policy with economic recovery and growth goals by focusing on developing renewable energy and energy efficiency technologies and creating more than half a million green jobs. In the area of building efficiency, the Governor’s Plan calls for:

- Adopting stronger appliance standards for lighting, consumer electronics, and other products;
- Creating new efficiency standards for new buildings;
- Increasing public education and enforcement efforts so that the gains promised by California’s efficiency standards are realized;
- Adopting a plan for achieving “zero-net-energy” homes and businesses;
- Making existing buildings more efficient, especially the half of California homes that were built before the advent of modern building standards; and
- Providing information to commercial investors and homebuyers by disclosing building energy consumption prior to building sale.

The Energy Commission’s draft Integrated Energy Policy Report (2011) includes an energy efficiency chapter that emphasizes the zero net energy policy goals for the state’s residential and nonresidential buildings. It articulates how the Building Energy Efficiency Standards, including Reach Standards, will be updated periodically to attain the aggressive levels of energy efficiency required to make zero net energy buildings cost-effective for consumers.

The 45 Day Language Express Terms described in this NOPA are designed to comply with and meet all of these state laws and policies. To summarize:

As required by law, the proposed standards are cost-effective to consumers (that is, the energy bill savings over the life of the building will be much greater than any increased construction costs that will result from the standards).

The proposed standards take a crucial step in meeting the 2020 and 2030 net energy goals; if adopted, they will advance new buildings by about 30% of the way between current practice and zero net energy. A key element is the requirement that most new buildings be “solar ready” so that consumers choosing to do so will be able to install solar equipment as cheaply and easily as possible. Moreover, the standards offer solar as builder-chosen alternatives for many building types.

By saving large amounts of energy, the standards will made a major contribution in meeting the state's goals for reductions in greenhouse gas emissions.

By making buildings cheaper to own and operate, the standards will encourage investment in new construction and will also make more capital available for other investments, thereby stimulating economic growth and the creation of new jobs.

B. Summary of Existing Regulations

The Building Energy Efficiency Standards were first adopted in 1976 and have been updated periodically since then as directed by statute. In 1975 the Department of Housing and Community Development had adopted rudimentary energy conservation standards, under their State Housing Law authority, that were a precursor to the first generation of the Building Energy Efficiency Standards. However, the Warren-Alquist Act was passed that year with explicit direction to the Commission to adopt and implement the Building Energy Efficiency Standards (Standards). The Commission's statute created separate authority and specific direction to the Commission regarding what the Standards are to address, what criteria are to be met in developing standards, and what implementation tools, aids, and technical assistance are to be provided.

The Standards contain energy efficiency (and indoor air quality requirements) for newly constructed buildings, additions to existing buildings, alterations to existing buildings, and, in the case of nonresidential buildings, repairs to existing buildings. Public Resources Code sections 25402(a)-(b) and 25402.1 emphasize the importance of building design and construction flexibility by requiring the Commission to establish performance standards, in the form of an "energy budget" in terms of the energy consumption per square foot of floor space. The Standards have done so since 1976 and the 45 Day Language Express Terms described in this NOPA will do the same if adopted.

Public Resources Code section 25402.1 also requires the Energy Commission to support the performance standards with compliance tools for builders and building designers. Thus in its Alternative Calculation Method (ACM) Approval Manuals, which are adopted by regulation in support of the Standards, and which are described in more detail below, the Commission establishes requirements for input, output and calculational uniformity in computer programs that are used to demonstrate compliance with the Standards. The ACM Manuals thereby allow private firms to develop compliance software for approval by the Commission, which further encourages flexibility and innovation.

The Commission also adopts Reference Appendices that contain data and other information that help builders comply with the Standards.

The Standards are divided into three basic sets. First, there is a basic set of mandatory requirements that apply to all buildings. Second, there is a set of performance standards – the energy budgets -- that vary by climate zone (of which there are 16 in California) and building type; thus the Standards are tailored to local

conditions. Finally, there third set is constitutes an alternative to the performance standards, which is a set of prescriptive “packages” that are basically a “checklist” compliance approach. A summary outline of the standards is as follows:

- Mandatory requirements that apply to all building types are in Sections 110.0 – 110.9.
- The requirements for nonresidential buildings, high-rise residential buildings, and hotels/motels are in Sections 120.0 to 120.9 and 130.0 to 141.0. Specialized mandatory requirements for such buildings are in Sections 120.120.9; the performance compliance approach is explained in Section 140.1; nonresidential prescriptive packages are in Sections 140.2 to 140.9; and requirements for additions, alterations, and repairs to existing nonresidential buildings are in Section 141.
- The requirements for low-rise residential buildings are in Sections 150.0 to 150.2. Specialized mandatory requirements for these buildings are in Section 150.0; the performance compliance approach is explained in Section 150.1; prescriptive packages are in Section 150.1; and requirements for additions and alterations to existing buildings are in Section 150.2.
- The administrative regulations for the Standards are in Part I, Chapter 10.
- The voluntary Reach Standards are in Part 11, the Green Building Standards.

C. Summary of the Proposed Regulations

Overview

The 2013 Standards focus on several key areas to (1) improve the energy efficiency of newly constructed buildings (and additions and alterations to existing buildings), (2) help reduce electricity demand reductions during critical peak periods, and (3) enable simple and efficient future solar system installations.

The most significant efficiency improvements to the residential Standards are proposed for windows, envelope (wall, ceiling, and floor) insulation, and testing of heating, ventilating, and air-conditioning (HVAC, basically furnaces, air conditioners, and ducts) systems; for the first time, HVAC duct sealing will be a mandatory requirement for all residential building projects.

New efficiency requirements for “process loads” such as commercial refrigeration, data centers, kitchen exhaust systems, and compressed air systems are included in the nonresidential Standards, as are expanded criteria for acceptance testing of mechanical and lighting systems. Finally, there are new requirements for compliance data to be collected in a Commission-managed repository.

The proposed standards will help residential and small commercial buildings to respond to critical electricity peak demand events by reducing air conditioning loads.

This is accomplished through requirements for capabilities that enable utilities to communicate remotely with building controls, and for those controls to respond by reducing air conditioning use.

Facilitating future solar electric and solar thermal system installations is another new element of the 2013 Standards. This is accomplished by ensuring that necessary space and equipment connections will be available.

The 2013 Standards also include updates to the voluntary “Reach” standards in Part 11. In order for buildings to be able to advertise that they meet those standards, a set of prerequisites has been established. The residential Reach Standards have also been updated to require additional energy efficiency or on-site renewable electricity generation to meet a specific threshold of expected electricity use. Both the residential and nonresidential Reach Standards include requirements for building additions and alterations as well as new construction.

Specific Benefits anticipated from the Proposed Standards

The proposed Standards are expected to save California residents and businesses hundreds of millions of dollars in energy costs over the next decade. These energy cost savings also benefit the environment, due to the reductions in natural resource utilization and the greenhouse gas emissions that energy production, distribution and consumption generate. The nonmonetary benefits of the proposed Standards include more reliable outdoor air ventilation and better thermal comfort for the health and welfare of building occupants in homes and buildings, by increasing and improving the field verification requirements of energy-related equipment and controls. The proposed Standards also provide a nonmonetary benefit of increased transparency in government by improving the clarity and increasing the simplicity of the energy efficiency requirements. There is no effect on worker safety, the prevention of discrimination, or the promotion of fairness or social equity anticipated from the proposed Standards.

A summary of the specific changes to current Building Energy Efficiency Standards that are proposed under this rulemaking are as follows. ***These proposed changes are discussed in more detail in the Initial Statement of Reasons that is being published simultaneously with this NOPA.***

1. PART 6

In addition to the substantive changes described below, all numbering of Part 6 sections has been modified to accommodate additions to the Standards language. For example, Section 100 has been changed to Section 100.0 and Section 102 has been changed to Section 100.2. Due to this renumbering, it is no longer necessary to reserve code sections for future use, since the new numbering scheme accommodates a vast number of section and subsection divisions.

a. STANDARDS CHANGES FOR ALL BUILDING TYPES

Scope (§100.0): Added requirements for covered processes. Added an exception for the Mixed Occupancy lighting requirements. Clarified the certification requirements for manufactured devices.

Application of Standards (§100.0, Table 100.0-A): Edited table to be consistent with other proposed.

Definitions (§101): Added new definitions, deleted obsolete definitions, and modified existing definitions to reflect the updated Standards language.

Mandatory Requirements for Appliances (§110.1): Edited for clarity.

Mandatory Requirements for Space Conditioning Equipment (§110.2): Updated the requirements for chillers to match federal appliance efficiency standards (ASHRAE 90.1). Added requirements for programmable setback thermostats to be upgradeable to communicating setback thermostats. Added requirements for evaporative or open cooling towers to include water saving features.

Mandatory Requirements for Service Water Heating Systems (§110.3): Removed an exception for hot water distribution system controls on water heating systems serving single dwelling units. Added requirements for each shower head to be controlled by a dedicated mixing valve and to set minimum limits on shower head spacing.

Mandatory Requirements for Fenestration Products (§110.6): Added an exception that states that neither fenestration products (basically, windows and skylights) nor exterior doors are subject to air leakage requirements if they are field fabricated (constructed at the building site rather than in a manufacturer's factory). Reduced the building floor area threshold for when National Fenestration Rating Council (NFRC) ratings are required for field fabricated fenestration products. Added a provision to the existing requirement that fenestration products be rated according to NFRC procedures; the new provision requires that visual transmittance be included among the product characteristics that must be tested and labeled.

Mandatory Requirements to Limit Air Leakage (§110.7): Added air barrier design and construction requirements and included specifications for materials deemed to comply as air barriers.

Mandatory Requirements for Insulation, Roofing Products and Radiant Barriers (§110.8): Edited for clarity. Added a prohibition of insulation placement on top of suspended ceilings. Added an emittance requirement for radiant barriers.

Mandatory Requirements for Lighting Control Devices and Systems, Ballasts and Luminaires (§110.9): Edited for clarity and to reflect changes to the prescriptive lighting requirements. Updated to be consistent with recent changes to the Energy Commission's Title 20 Appliance Efficiency Regulations. (Self contained lighting

controls are now regulated by Title 20 and lighting controls systems continue to be regulated by this section.) Added lighting control acceptance requirements. Moved requirements for supplementary overcurrent protection panels from the prescriptive package section to this mandatory section.

Mandatory Requirements for Solar Ready Buildings (§110.10): Added requirements for building designs to provide for the future installation of solar electric or solar thermal systems.

b. STANDARDS CHANGES FOR NONRESIDENTIAL, HIGH-RISE RESIDENTIAL, AND HOTEL/MOTEL BUILDINGS

MANDATORY REQUIREMENTS

General (§120.0): Modified Subchapter and Section headings to include all mandatory requirements for nonresidential buildings other than the lighting requirements that remain in Section 130.0.

Ventilation (§120.1): Edited for clarity. Added ventilation control by an occupant sensor ventilation control device (a device that senses human occupancy based on motion detection technology, then controls ventilation air flow rates accordingly) as an acceptable approach to meet the outdoor air control requirements. Added a requirement for ventilation air to be measured and controlled within 10% of the required air flow rates.

Controls for Space Conditioning Systems (§120.2): Edited for clarity. Added requirements for multipurpose rooms, classrooms, and conference rooms: they must (1) have shutoff and reset controls; (2) be equipped with occupant sensors; and (3) and provide for automatically setup cooling temperature setpoints, setback heating temperature setpoints, and reduced ventilation rates during unoccupied periods. Added a requirement for air-cooled unitary direct-expansion equipment to include an economizer fault detection and diagnostics system.

Pipe Insulation (§120.3): Edited for clarity. Increased required levels of pipe insulation; summarized in Table 120.3-A.

Mechanical System Acceptance (§120.5): Edited for clarity. Added system acceptance requirements for supply air temperature reset controls, condenser water temperature reset controls, and Energy Management Control Systems.

Covered Processes (§120.6): Renamed Section to include all Covered Processes. Added subsections for Commercial Refrigeration, Enclosed Parking Garages, Process Boilers, and Compressed Air Systems.

Refrigerated Warehouses (§120.6(a)): Edited for clarity. Added an exception to exclude quick chilling and quick freezing compressors and condensers from meeting the requirements of this section. Increased the refrigerated warehouse insulation requirements. Modified the exception for variable speed evaporators to

accommodate long term storage facilities that are designed for constant airflow. Removed the requirement for condensers utilizing ammonia to be evaporatively cooled. Added condensing temperature reset control requirements. Added fan-powered condenser efficiency requirements. Added requirements for infiltration barriers. Added system acceptance requirements for electric resistance underslab heating systems, evaporators, evaporative condensers, air-cooled condensers, and variable speed compressors.

Commercial Refrigeration (§120.6(b)): Added entire subsection, with new requirements for condenser speed controls, fan-powered condenser efficiency, compressor system controls, display case lighting controls, and refrigeration heat recovery.

Enclosed Parking Garages (§120.6(c)): Added entire subsection, with new requirements for mechanical ventilation systems to modulate ventilation rates in response to the automatic detection of contaminant levels.

Process Boilers (§120.6(d)): Added entire subsection, with new requirements for boilers to be equipped with a combustion air positive shut-off device, for fan motors to be variable speed or to limit demand based on airflow rate, and to limit the amount of excess oxygen used in the combustion process.

Compressed Air Systems (§120.6(e)): Added entire subsection, with new requirements for trim compressors and for , compressed air storage, compressed air system controls, and acceptance testing of compressed air systems.

Insulation (§120.7): Added entire section, with new minimum requirements for roof, wall, and floor insulation.

Building Commissioning (§120.8): Added entire section, with new requirements for design-phase commissioning. Relocated some current building commissioning requirements, which are in Title 24, Part 11 and which pertain to energy systems that are covered in Part 6, to this section.

Commercial Boilers (§120.9): Added entire section, with new requirements for boilers to be equipped with a combustion air positive shut-off device, for fan motors to be variable speed or limit demand based on airflow rate, and to limit the amount of excess oxygen used in the combustion process.

Lighting Controls and Building Power Subchapter (§§130.0 to 130.5): Added Building Power into the scope of Subchapter 4.

Lighting Controls and Equipment (§130.0): Edited for clarity and to improve organization. Added fire station dwelling accommodations as a residential building space type that must meet the residential lighting requirements. Simplified the criteria used to determine luminaire power and added a new scheme to classify luminaires. Added a requirement for installation inspections of track lighting integral current limiters (current limiters that are built directly into the track lighting fixture).

Modified the test requirement for light-emitting diode (LED) lamps, such that LEDs must now adhere to a nationally recognized test standard.

Indoor Lighting Controls (§130.1): Edited for clarity, removed redundant code language, and improved organization. Reduced the amount of lighting allowed to be installed in a building area without controls. Reduced the general lighting threshold (measured in watts per square foot), which means that the multi-level lighting control requirements of this section now apply to more spaces in more buildings. Modified the requirements for multi-level control steps and light uniformity to be appropriate to specific lighting technologies. Added a requirement for multi-level lighting controls to meet at least one of five listed control types. Added a requirement for daylighting controls in parking garages. Reduced the building size threshold (measured in square feet) for when demand responsive lighting controls are required.

Outdoor Lighting Controls and Equipment (§130.2): Edited for clarity. Removed exceptions to the outdoor lighting equipment and control requirements in this section. Replaced cutoff requirements with requirements for Backlight (light applied to the back of a subject being lit), Uplight (light applied from below a subject being lit), and Glare ratings. Reduced the threshold luminaire wattage for when light distribution requirements apply. Added requirements for outdoor lighting to be switched independently from other electrical loads, and for certain outdoor luminaires to be controlled by multi-level motion sensors (where light fixtures have a low light level for periods when no motion is detected, and a higher light level for when motion is detected), part-night lighting control devices (controls that reduce or turn off outdoor lighting for a portion of the night), or centralized time-based zone lighting controls (where lighting in multiple zones can be scheduled to turn on and off from a central location).

Sign Lighting Controls (§130.3): Edited for clarity.

Lighting Control Acceptance (§130.4): Edited for clarity. Added lighting control certification requirements.

Electrical Power Distribution Systems (§130.5): Added entire section, with new requirements for service metering, disaggregation of electrical circuits, maximum voltage drop, receptacle circuit controls, demand response signals, and energy management control systems; added Table 130.5-A to summarize the minimum requirements for metering electrical loads.

PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES

Performance and Prescriptive Compliance Approaches (§140.0): Edited for clarity. Modified the basis of all climate zone descriptions from metes and bounds to zip codes.

Performance Compliance Approach: Energy Budgets (§140.1): Edited for clarity. Added explanation that the requirements for Compliance Software certification by

the Energy Commission are documented in the Nonresidential ACM Approval Manual.

Prescriptive Approach (§140.2): Clarified that buildings must be designed, constructed and installed to meet the new prescriptive requirements for Covered Processes.

PRESCRIPTIVE STANDARDS

Building Envelopes (§140.3): Edited for clarity. Updated the prescriptive envelope criteria in Table 140.3-A to reflect the revised cool roof requirements and to revise and simplify the fenestration requirements. In addition:

Exterior Roofs and Ceilings (§140.3(a)1): Removed climate zone specific exceptions to roof reflectance and emittance requirements. Increased minimum roof reflectance requirements. Added steep-sloped roof reflectance and emittance requirements for high-rise residential and hotel/motel occupancies.

Fenestration (§140.3(a)5): Revised fenestration heat transfer criteria and added new requirements for visual transmittance and use of area-weighted performance ratings for U-factors, relative solar heat gain coefficients, and visual transmittance.

Air Barrier (§140.3(a)9): Added air barrier requirements for buildings in climate zones 10-16.

Other Envelope Trade Off Approaches (§140.3(b)): Eliminated the Overall Envelope Energy Approach as a prescriptive compliance option.

Daylighting (§140.3(c)): Modified daylighting requirements for large enclosed spaces in low-rise buildings, including increases in the percent of floor area that must be daylit.

Space Conditioning Systems (§140.4): Edited for clarity. In addition:

Fan Power (§140.4(c)): Replaced requirements for variable air volume capability in only large fans and motors with requirements for variable airflow capability in various sizes of multiple zone and single zone HVAC systems (See also §140.4(m)). Added requirement for fractional fan and pump motors to be electronically-commutated or to have a minimum efficiency.

Zone Controls (§140.4(d)): Removed the variable air volume exception to the requirement for controls that prevent simultaneous heating and cooling. Added requirement for direct digital control systems to include two stage heating controls. Removed an exception from the economizer requirements. Expanded the requirements for direct expansion systems to stage or modulate cooling capacity and to use economized air to the greatest extent possible.

Economizers (§140.4(e)): Added requirements for air economizers and return air dampers in the areas of warranty, drive mechanism, damper reliability testing, damper leakage, adjustable setpoint controls, relief air system and damper control sensor location, accuracy, and calibration. Updated the economizer and efficiency trade-offs in Tables 140.4(e)-A, and B, and the air economizer high air shut-off control requirements in Table 140.4(e)-C. Added requirements for all space conditioning systems to use integrated economizer controls (economizer controls that are interlocked with mechanical cooling controls, such that the economizer is used to the greatest extent possible, when appropriate, before mechanical cooling is used). Added requirements for direct expansion systems to stage or modulate cooling capacity, such that reduced cooling capacity must be delivered with a corresponding reduction in electrical power demand.

Chillers (§140.4(i)): Added requirement for chillers to adhere to ASHRAE 90.1 Path B efficiency levels (See Section 110.2 for chilling equipment efficiency requirements, including Path B).

Limitation on Air-Chillers (§140.4(j)): Changed the limitation on air-cooled chillers from 100 tons (when the chiller plant capacity exceeds 300 tons) to 300 tons (regardless of chiller plant capacity).

Fan Control (§140.4(m)): Added this subsection to describe the requirements for variable airflow capability in multiple zone and single zone HVAC systems.

Indoor Lighting (§140.6): Edited for clarity. In addition:

Actual Lighting Power Density (§140.6(a)): Raised the threshold for exempt portable lighting in conjunction with lowering of allowable watts per square foot for office lighting. Removed Power Adjustment Factors (PAFs, used in the Standards to provide prescriptive compliance credit for specific lighting controls within the calculation of allowable lighting power densities) for daylighting where controls have been changed from prescriptive to mandatory requirements; simplified the applications of PAFs for other lighting controls. Expanded the explanations of PAFs available in Table 140.6-A to include the available credits for all lighting control applications recognized in the Standards. Because PAFs only apply to permanent lighting installations, criteria have been added for when furniture mounted general lighting can be considered permanently installed. Added installation inspection requirements to verify that the PAFs shown in building permits match the PAFs for the lighting controls actually installed. Revised the requirements for refrigerated cases to be consistent with the Title 20 Appliance Efficiency Regulations. Removed elevator lighting from the building lighting budget, in order to be consistent with national standards.

Allowed Lighting Power Density (§140.6(c)): Reduced the allowed lighting power for specific building types and function areas. The additional power credit provided to display lighting has been modified to account for different light fixture mounting heights; more credit is now allowed for display lighting mounted high on a side wall rather than display lighting mounted low on a side wall, since a light fixture mounted

high on a wall will also provides some general lighting to the space. The term used for the lighting parameter that is a measure of the light falling on a horizontal surface, which is used to determine the allowable lighting power in a prescriptive compliance option, has been updated from “illuminance” to “illuminance level”, or “LUX” (the parameter has not changed, but the term used for this parameter has changed in order to be consistent with the new 10th Edition of the Illuminating Engineering Society’s Lighting Handbook). Added requirements for automatic daylight controls in secondary daylit zones.

Automatic Daylighting Controls (§140.6(d)): Added this subsection to describe a requirement for the installation of automatic daylight controls in secondary daylit zones. (Automatic daylight controls have sensors that measure how much light is entering a building space from windows or skylights and reduce the amount of electrical lighting accordingly. The secondary daylit zone is the area of the building located a horizontal distance from the window equal to twice the vertical distance between the floor and the top of the window.)

Outdoor Lighting (§140.7): Edited for clarity. Removed all language specific to local building standards (which local agencies can adopt if their ordinances save more energy than the Energy Commission’s building standards), most notably the additional amount of outdoor lighting power that was allowable in local ordinances. Removed additional lighting power allowances for water feature lighting. Reduced additional lighting power allowances for general hardscape (paved areas like streets and sidewalks) and for building entrances and exits, vehicle service station canopies, and outdoor dining areas.

Signs (§140.8): Edited for clarity. Added an electronic ballast option to the requirement that fluorescent lighting systems use lamps with a minimum color rendering index.

Covered Processes (§140.9): Added entire section. Added subsections for Computer Rooms, Commercial Kitchens, and Laboratory Exhaust Systems.

Computer Rooms (§140.9(a)): Added entire subsection, with new requirements for economizers, prevention of reheat, humidification, fan power consumption, fan control and air containment.

Commercial Kitchens (§140.9(b)): Added entire subsection, with new requirements for replacement air, exhaust airflow rates, kitchen ventilation, and kitchen exhaust system acceptance.

Laboratory Exhaust Systems (§140.9(c)): Added entire subsection, with new requirement for spaces with laboratory exhaust hoods to be capable of reducing zone exhaust and makeup airflow rates to regulated minimums when the exhaust hoods are not operating.

ADDITIONS, ALTERATIONS AND REPAIRS

Additions (§141.0): Edited for clarity, including new explanations of when new solar zone requirements (see Section 110.10) apply.

Alterations (§141.0): Edited for clarity, including new explanations of when new solar zone requirements in Section 110.10 apply, and a simplification of the fenestration prescriptive requirements. Updated roof reflectance criteria and added a reflectance and insulation trade-off option. Removed an exception to replacement roof requirements for specific roof and recoating types. Added a requirement for space conditioning systems with economizers to have control systems that integrate economizer and cooling operations. Updated indoor lighting requirements, including two new tables that summarize luminaire alteration and modifications-in-place requirements (Table 141.0-C and D); reduced the altered-luminaires-per-space threshold for when lighting alterations must comply with these requirements. Added requirements for outdoor lighting systems to meet the applicable prescriptive requirements of outdoor lighting systems for new construction, depending on connected lighting load and percent of replacement luminaires.

c. STANDARDS CHANGES FOR LOW-RISE RESIDENTIAL BUILDINGS

MANDATORY REQUIREMENTS

Insulation (§150.0(a-d)): Edited for clarity. Increased minimum ceiling, wall and floor insulation levels.

Hotel and Motel Guest Rooms (§150.0(g)): Removed language for air retarder wraps in this subsection because it is duplicative with the revised subsection (§150.0(g)) for vapor retarders. This subsection is now used to explain new requirements for hotel and motel guest room lighting and space-conditioning system controls. The lighting system controls must be capable of turning off luminaires and half of the plug-in receptacles when the hotel room is not occupied. The space conditioning controls must be capable of resetting the room thermostat setpoint temperature either up (during cooling) or down (during heating) when the room is not occupied.

Vapor Retarders (§150.0(g)): Clarified requirements for vapor retarders in exterior walls by adding specific references to Class I and Class II vapor retarders (each vapor retarder “class” refers to a specific level of vapor resistance; these class differentiations are used in the California Building Code, as well as other national and international building codes).

Space Conditioning Equipment (§150.0(h)): Added requirements for the location of outdoor condensing units and the installation of central forced-air furnaces to ensure proper operations. (Condensing units must now be located five feet or more from a dryer vent and forced-air furnaces must be designed and installed to meet the manufacturer’s maximum temperature rise (the temperature increase from the furnace inlet to the furnace outlet) specifications.)

Hot Water Piping (§150.0(j)): Edited for clarity. Added requirement for all nonrecirculating piping $\frac{3}{4}$ inch in diameter or larger to be thermally insulated. Increased maximum length of 1 inch pipe allowed for nonrecirculating piping. Added requirements for all below grade hot water piping to be insulated.

Residential Lighting (§150.0(k)): Edited for clarity. Modified the method used to classify a luminaire as high efficacy. Added requirements for energy management controls systems (EMCS) and multi-scene programmable controllers to be capable of complying with the dimming lighting control requirements; EMCS must also be capable of complying with the vacancy sensing lighting control requirements. Added requirements for one high efficacy luminaire to be installed in each bathroom and for vacancy sensors to be installed in garages. Installation requirements for exhaust fans have been moved to Section 110.7 - these requirements belong in the section of the Standards that explains the mandatory features of all mechanical equipment, regardless of building type. Added new lighting control installation verification requirements.

HVAC Ducts, Plenums and Fans (§150.0(m)): Edited for clarity. Added requirement for all conditioned air ducts to be sealed and field tested for duct leakage compliance. Added requirements for the configuration, efficiency, pressure drop, and product labeling of air filtration devices. Added requirements for duct system and air filter grille sizing, with an option to meet airflow and fan watt draw test requirements instead of meeting these sizing requirements. Added a prohibition on the use of bypass ducts to deliver conditioned supply air directly to the return air duct system. Changed criteria – that zonally controlled forced air systems meet minimum airflow and maximum fan watt draw requirements in every zonal control mode – from a prescriptive to a mandatory requirement. Added requirement for field verification when using the option to put space conditioning ducts within the living space of a house (instead of insulating and sealing ducts typically located in the attic).

Water Heating Systems (§150.0(n)): Edited for clarity. Added requirements for gas or propane water heating systems serving individual dwelling units to be designed to allow for future installations of high efficiency water heaters (requirements were added for electrical receptacle proximity, venting, drainage, and fuel supply pipe sizing).

Ventilation for Indoor Air Quality (§150.0(o)): Edited for clarity. Added requirement for ventilation system performance to be field verified.

Fenestration Products (§150.0(q)): New subsection that places a maximum conductive heat transfer (U-factor) requirement on all fenestration products separating conditioned space from unconditioned space.

Solar Ready (§150.0(r)): Added subsection to refer to the mandatory requirements for solar ready buildings that are contained in Section 110.10.

PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES

Performance and Prescriptive Compliance Approaches (§150.1(a)): Edited for clarity. Modified the basis of all climate zone descriptions from metes and bounds to zip codes.

Performance Standards (§150.1(b)): Edited for clarity. Added the explanation that the requirements for Compliance Software certification by the Energy Commission are documented in the Nonresidential ACM Approval Manual.

PRESCRIPTIVE STANDARDS

Component Packages (§150.1(c)): Removed alternative prescriptive component packages; Package A is now the only component package contained in the residential prescriptive standard. Updated footnotes in Table 150.1-C.

Insulation (§150.1(c)1): Edited for clarity. Added requirement for roof deck insulation. Increased the insulation requirements in Table 150.1-C. Removed exception to perimeter insulation for slab edges between conditioned space and concrete slabs of unconditioned spaces.

Radiant Barrier (§150.1(c)2): Added exception to radiant barrier requirement when roof deck insulation is installed below the roof deck.

Fenestration (§150.1(c)3): Edited for clarity. Reduced the maximum conductive heat transfer and relative solar heat gain requirements of vertical fenestration products.

Shading (§150.1(c)4): Edited for clarity.

Thermal Mass(§150.1(c)5): Removed interior mass capacity requirements that were specific to a prescriptive component package that has been eliminated.

Space Heating and Cooling (§150.1(c)7): Edited for clarity. Installing whole house fans (a fan, typically installed in the attic, that pulls cooler outside air through open windows, into the house, and forces warmer air out through attic vents), inspecting the quality of the insulation installation, verifying the proper refrigerant charge within the space conditioning system, and verifying the mechanical ventilation system performance are all added to the list of measures required in the prescriptive compliance approach.

Water Heating Systems (§150.1(c)8): Added requirements for water heating systems serving multiple dwelling units to be equipped with a demand control system, to split the recirculation system into two loops, and to provide a specific percentage of the annual water heating energy with a solar thermal system, depending on climate zone. Added requirements for electric resistance water heating systems serving single dwelling units: they may be installed only if gas service is unavailable, and if they are installed then they must be installed within the building envelope and there must also be a solar system that provides at least half of

the annual water heating energy.

Thermostats (§150.1(c)10): Removed this subsection; all thermostat requirements are now mandatory and contained in Section 110.2.

Space Conditioning Ducts (§150.1(c)10): Edited to be consistent with the new mandatory requirements for duct sealing in Section 150.0(m).

Central Fan Integrated Ventilation Systems (§150.1(c)11): Added requirement for ventilation system performance to be field verified.

Roofing Products (§150.1(c)12): Increased the minimum aged solar reflectance requirements for low-sloped roofs in specific climate zones.

Quality Insulation Installation (§150.1(c)13): Added new subsection to require field verification of insulation installation.

ADDITIONS AND ALTERATIONS

Additions (§150.2(a)): Relocated the exception for indoor air quality ventilation. Clarified that only the whole-building ventilation component of the indoor air quality ventilation requirements of subsection 150.0(o) do not need to be met by additions. Added exceptions to the mandatory ceiling insulation and solar zone requirements for additions.

Prescriptive Compliance Approach (§150.2(a)1): Edited for clarity. Increased the minimum wall insulation level for additions 1000 square feet or less.

Performance Compliance Approach (§150.2(a)2): Edited for clarity. Increased the minimum wall insulation level required in existing structures. Electric resistance water heaters used in the performance compliance approach must now comply with the Appliance Regulations in Title 20.

Alterations

Prescriptive Compliance Approach (§150.2(b)1): Edited for clarity. Added an exception to the solar ready requirements.

Fenestration (§150.2(b)1.A): Added an exception to the replacement fenestration requirements, such that if an alteration project has a limited amount of glazing area with acceptable thermal and solar gain performance, then the alteration project does not need to meet the replacement fenestration requirements.

Duct Replacement (§150.2(b)1.D): Edited to clarify that the requirements specified for duct systems in 150.0(m) also apply to duct replacements.

Duct Sealing (§150.2(b)1.E): Edited for clarity. Modified subsection to require duct sealing in all climate zones.

Space Conditioning System (§150.2(b)1.F): Edited for clarity. Added language that explains how non-standard space conditioning systems (systems other than ducted split system central air conditioners and ducted split system heat pumps) can comply with the refrigerant verification requirements (this is necessary because the verification tests included in the Reference Appendix will not work for non-standard systems).

Roofs (§150.2(b)1.H): Edited for clarity. Increased the minimum aged solar reflectance for steep-sloped roofs in specific climate zones. Increased the minimum aged solar reflectance and thermal emittance requirements for low-sloped roofs in specific climate zones. Added an exception that allows solar reflectance and insulation trade-offs.

Performance Compliance Approach (§150.2(b)2): Edited for clarity. Added an exception to the solar ready requirements. Modified the criteria for when the performance approach can be used for alteration projects. Modified the criteria for when the performance approach uses the building project existing conditions rather than the prescriptive requirements to generate the standard design used to generate the energy budget that the proposed alteration must meet.

2. PART 1, CHAPTER 10

ADMINISTRATIVE REGULATIONS CHANGES

Definitions (§10-102): Added new definitions, deleted obsolete definitions, and modified existing definitions for clarification and to support changes to the Standards language.

Compliance Documentation (§10-103(a) ,(b)): Added documentation requirements for nonresidential building commissioning. Clarified the format, content, informational order, and signature authority for the Certificate of Compliance. Added requirements for submission of compliance documentation to the Commission Compliance Data repository. Clarified the building permit application processes and enforcement agency authority. Clarified the content, signature authority, and submittal requirements for the Installation Certificate, Certificate of Acceptance, and Certificate of Field Verification and Diagnostic Testing. Clarified the requirement for builders to provide compliance documentation to building owners.

Enforcement Agency Requirements (§10-103(d)): Edited for clarity.

Locally Adopted Energy Standards (§10-106): Edited for clarity.

Compliance Software, Alternative Component Packages, Exceptional Methods, and Data Registries (§10-109): Edited for clarity and reorganized into subsections.

Certification and Labeling of Fenestration Products (§10-111): Edited for clarity. Added requirement to include visual transmittance data on all fenestration labels.

Certification and Labeling of Roofing Products (§10-113): Edited for clarity.

Outdoor Lighting Zones (§10-114): Removed all language on local outdoor lighting ordinances.

Data Registries and Repositories (§10-115): Added this section on the submittal requirements for data registries, which explains how data registries and electronic data repositories will be approved by the Energy Commission. A “data registry” is a web service hosted by an entity that is approved by the Energy Commission and that receives and stores the official versions of Standards compliance documents. A “data repository” is an electronic database that stores code compliance documentation at the Energy Commission.

3. CHANGES TO THE ALTERNATIVE CALCULATION METHOD APPROVAL MANUALS

The Residential and Nonresidential Alternative Calculation Method (ACM) Approval Manuals are adopted by regulation to support the Standards in Part 6. The ACM Approval Manuals contain requirements that developers of computer software must meet for the Energy Commission to approve their software for showing compliance with the Standards, including how compliance software programs are certified and decertified by the Energy Commission, and what needs to be included in the application package provided to the Energy Commission for software certification.

Residential Alternative Calculation Methods Approval Manual

The most significant change for the Residential ACM Approval Manual is the new requirement for all compliance software to include the Compliance Manager software, which developed by the Energy Commission, to perform compliance calculations and to produce compliance reports. The Compliance Manager software (1) develops a standard building design that meets the applicable energy budget, (2) compares the proposed building design to it, and, if the proposed building complies, generates compliance reports. Vendors interested in including the Compliance Manager into third-party compliance software must meet the criteria documented in the Residential ACM Approval Manual.

The other major change to the Residential ACM Approval Manual is elimination of all the accuracy tests that were previously required for third-party compliance software certification. Since the Compliance Manager software will separately be tested by the Energy Commission during the development process, the accuracy of the Compliance Manager does not need to be retested when it is included in a third-party compliance software program. The remaining accuracy tests ensure that the interfaces between each Commission-approved third-party tool and the Compliance Manager software are functioning appropriately.

Nonresidential Alternative Calculation Methods Approval Manual

The most significant changes to the Nonresidential ACM Approval Manual are those indicated above.

4. CHANGES TO THE REFERENCE APPENDICES

The Reference Appendices are organized into three sections, the Joint Appendices, Residential Appendices, and the Nonresidential Appendices. The 2013 Standards changes to the Reference Appendices are indicated below:

JOINT APPENDICES

JA1 – Glossary: Added, modified, and deleted terms to reflect the updated Standards language.

JA2 - Reference Weather/Climate Data: Added zip codes to the city and county climate zone table. Removed an explanation of a weather data format that is no longer used in the Standards.

JA3 - Time Dependent Valuation (TDV) Data: Updated all Time Dependent energy Valuation (TDV) data. TDV data is used in the performance compliance approach to incorporate the time-varying costs of energy into the energy budgets.

JA4 - U-factor, C-factor, and Thermal Mass Data: Added, modified, and deleted data to reflect the updated Standards language. JA4 is no longer used by either the residential or nonresidential compliance software so many of the existing entries are eliminated. Only the heat transfer data for assemblies relevant to the prescriptive compliance approach are now included in this appendix.

JA5 – Reference Design For Upgradeable Setback Thermostats: Added this appendix to support the new mandatory requirements for thermostats.

JA6 – HVAC Fault Detection and Diagnostic Technology: Expanded this appendix to include both charge indicator display and saturation pressure measurement sensor specifications. The new title of this appendix reflects this scope expansion. Specifications for Saturation Pressure Measurement Sensors (SPMS) are provided as a substitution for the existing refrigerant pressure diagnostic technology, such that a non-intrusive procedure for a HERS rater to access the refrigerant pressure measurements during the refrigerant charge verification procedure is available.

JA7 – Data Registry Requirements: Added this appendix to reflect updates to the Standards language. This appendix covers the roles and responsibilities of authorized registry users, document registration requirements, electronic and digital signature requirements, data exchange requirements, and data registry approval.

JA8 – Qualification Requirements for Residential Luminaires Using LED Light Sources: Modified this appendix to reflect the changes to the lighting Standards. Existing test protocols are replaced with references to nationally recognized test standards. Existing language from the mandatory and prescriptive code sections for residential lighting are restated here to organize all qualification requirements into one reference appendix.

JA9 – Qualification Requirements for Low Leakage Air Handling Units: Added this appendix to reflect updates to the Standards language.

Residential Appendices

RA1 – Special Case Residential Field Verification and Diagnostic Test Protocols: Replaced the existing RA1 appendix with explanations of residential field test protocols to reflect updates to the Standards language. The HVAC sizing methodology is removed because it is relevant only as documentation of the residential ACM reference method and will therefore be documented in the Energy Commission’s Residential ACM Reference Manual. A new process for special case test protocol approval is documented. Field verification and diagnostic test protocols are added for measuring HVAC system refrigerant charge.

RA2 – Residential HERS Verification, Testing and Documentation Procedures: Modified this appendix for clarity and to reflect updates to the Standards language. References are added to the Compliance new JA7 for data registry requirements and the revised RA1 for special case verification protocols. Roles are explained for the documentation author, installing contractor, and Home Energy Rating Service (HERS) rater in the document registration procedures.

RA3 – Residential Field Verification and Diagnostic Test Protocols: Modified this appendix to clarify existing test protocols and reflect updates to the Standards language. Significant revisions are made to the refrigerant charge and quality insulation installation test protocols. The verified duct design compliance description and the duct surface area, R-value and leakage verification protocols are reorganized and rewritten for clarity. A reference to the new JA9 appendix is added for low leakage air handler testing. New field verification protocols are added for duct designs, air filter devices, zonally controlled HVAC systems and mechanical ventilation. Specifications are updated or added for sensor accuracy and response times, flow capture hood airflow measurements, digital revenue meter measurements, and charge indicator display devices.

RA4 – Eligibility Criteria for Energy Efficiency Measures: Modified this appendix for clarity. Expanded the solar water heating system eligibility criteria.

RA5 – Interior Mass Capacity: Removed this entire appendix. Interior mass capacity is no longer used in the Standards as a performance metric that requirements are based on.

Nonresidential Appendices

NA1 – Nonresidential HERS Required Verification, Testing and Documentation Procedures: Modified this appendix to reflect updates to the Standards language. The document registration procedures are updated and references to new appendices JA7 for registry requirements and RA1 for special case verification protocols are added.

NA2 – Nonresidential Field Verification and Diagnostic Test Procedures: Modified the duct leakage protocols in this appendix to improve clarity and enforceability.

NA3 - Fan Motor Efficiencies: Updated the efficiency data in this appendix to reflect updates to the Standards language.

NA4 - Compliance Procedures for Relocatable Public School Buildings: The proposed regulations make no substantive changes to this appendix.

NA5 - Envelope Tradeoff Procedure: Removed this entire appendix to reflect updates to the Standards language. The envelope tradeoff procedure is no longer specified as a prescriptive compliance option for nonresidential buildings.

NA6 - Alternate Default Fenestration Procedure to Calculate Thermal Performance: Modified this appendix, including a new calculation for the default visual transmittance.

NA7 – Acceptance Requirements for Nonresidential Buildings: Modified this appendix to reflect updates to the Standards language. Construction inspection and functional testing requirements are added and expanded for HVAC, lighting, and process equipment and controls.

NA8 - Luminaire Power: The title is changed to accurately represent the content. Many older lighting technologies are deleted because they are no longer commonly used. Updates are made to the description of several technologies to reflect changes to current practices for lamp and ballast combinations.

NA9 – Nonresidential Fault Detection and Diagnostics: Added this new appendix to reflect updates to the Standards language. This appendix describes the system requirements of air-cooled unitary direct-expansion equipment related to unit controls, including the fault detection capabilities required for this equipment type.

NA10 – Nonresidential Documentation procedures: Added this new appendix to reflect updates to the Standards language.

5. CHANGES TO THE VOLUNTARY Green Building Standards (TITLE 24, PART 11)

The existing text has been entirely replaced by proposed language that includes a

performance standard and a limited number of prerequisites.

COMPARABLE FEDERAL STATUTES OR REGULATIONS

There are no federal energy standards applicable to nonfederal buildings. (The current and proposed California building standards do, however, reference federal energy standards for particular *appliances*.)

CONSISTENCY AND COMPATIBILITY WITH EXISTING STATE REGULATIONS

There is no inconsistency or incompatibility with existing state regulations.

OTHER MATTERS PRESCRIBED BY STATUTE APPLICABLE TO THE ENERGY COMMISSION, OR TO ANY SPECIFIC REGULATION OR CLASS OF REGULATIONS PROPOSED FOR ADOPTION

All of the laws applicable to the proposed Standards, primarily Public Resources Code 25402 and 25402.1, are discussed above.

POTENTIAL MANDATES ON LOCAL AGENCIES OR SCHOOL DISTRICTS

The Energy Commission has determined that the proposed regulatory action would not impose a new mandate on local agencies. Existing law already obligates local building departments to serve as enforcement agencies for the Standards (see Public Resources Code sections 25402(a)-(b), 25402.1). Existing law also already requires compliance with the Standards as they apply to school buildings, and all other buildings, owned by local agencies (see California Code of Regulations, Title 24, Part I, Administrative Regulations of Department of School Administration (DSA)). While the proposed Standards add requirements for schools and other building types owned by local agencies, those requirements are the same as those applicable to all nonresidential buildings regardless of owner. Moreover, the proposed Standards recognize the unique characteristics of relocatable public school buildings, and they establish procedures to facilitate compliance by relocatables. Finally, the Standards for schools, and for all other buildings, are cost effective, and they will thereby reduce the costs of building and operating school buildings over their useful life.

ESTIMATE OF COSTS OR SAVINGS

See the Economic and Fiscal Analysis (Form 399), published simultaneously with this NOPA, for complete details. In sum:

- A. ***Total Statewide costs and benefits:*** The Standards are estimated to deliver \$1,684 million in benefits at a cost of \$1,212 million, for a cost-effectiveness ratio of 1.4 to 1.

- B. **Cost or Savings to any state agency:** Buildings owned and occupied by State agencies are required to comply with the Standards, as are all other nonresidential buildings. State agencies will benefit from reduced energy bills that more than pay for the costs of the Standards.
- C. **Cost to any local agency required to be reimbursed under Part 7 (commencing with Section 17500) of Division 4 of Title 2 of the Government Code:** The Standards do not result in new mandates to local agencies. Buildings owned and occupied by local agencies are required to comply with the Standards as any other nonresidential building. Local agencies will benefit from reduced energy bills that more than pay for the costs of the Standards.
- D. **Cost to any school district required to be reimbursed under Part 7 (commencing with Section 17500) of Division 4 of Title 2 of the Government Code:** School buildings are covered by the Standards and the Administrative regulations of the DSA require public school buildings to comply. Costs are not required to be reimbursed. Furthermore, schools will benefit from reduced energy bills that more than pay for the costs of the Standards.
- E. **Other nondiscretionary cost or savings imposed on local agencies:** No.
- F. **Cost or savings in federal funding to the state:** No.

INITIAL DETERMINATION OF NO SIGNIFICANT STATEWIDE ADVERSE ECONOMIC IMPACT ON BUSINESSES

The Energy Commission has made an initial determination that the adoption of the proposed Standards will not have a significant statewide adverse economic impact on businesses, including the ability of California businesses to compete with business in other states, as is described in more detail below. Comments on this determination (as on everything in this NOPA) are welcome.

- A. Identification of the types of businesses that would be affected.

The Standards will require energy efficiency measures for all new nonresidential construction, but those measures are cost-effective, so businesses will experience a positive economic impact. Indirectly, the Standards will require changes in practice, and the retraining of employees, in businesses that are involved in the design and construction of buildings, in compliance analysis and documentation, and in field verification. Any costs attributable to such changes and retraining would be short-term in nature, since the incremental cost increases for new technologies will not persist once these technologies become mainstream, and building practice changes requiring retraining will not result in ongoing cost increases. In any case, these incremental construction cost increases would ultimately be borne by the beneficiary of the Standards, the entity paying reduced energy bills.

- B. A description of the projected reporting, record keeping, and other compliance requirements that would result from the proposed action.

Most reporting, record keeping, and compliance duties associated with the Standards do not change. New acceptance requirements for nonresidential buildings will formalize and standardize documentation, but these requirements exist in a less structured way in the current Standards. Documentation authors who specify measures requiring field verification will need to notify a professional who will perform the acceptance tests, but this notification can be done by phone or electronically in very little time. Any such costs would, therefore, be insignificant, and to the extent they exist, would ultimately be borne by the beneficiary of the Standards, the entity paying reduced energy bills. It is necessary for the health, safety, or welfare of the people of the state that the business-report regulations in the proposed Standards apply to businesses.

C. Evidence relevant to economic impacts

The basis for the Commission’s findings on economic impacts is that the Standards are cost effective, and therefore will have a beneficial economic impact on the owners and occupants of buildings built to comply with the Standards. Evidence for the cost effectiveness of the Standards requirements are contained in the “Documents Relied Upon” listed in the Initial Statement of Reasons and on the Commission’s website.

COST IMPACT ON REPRESENTATIVE PRIVATE PERSONS OR BUSINESSES

The Energy Commission has determined that energy bill savings substantially in excess of compliance costs will be received by all private persons and businesses directly affected by the proposed Standards. The Energy Commission estimates that an average of \$3,300 additional single family residential construction costs may result from the proposed Standards. This estimate is likely more than what will be realized, since it does not account for volume pricing or reductions in technology costs once these technologies are provided to a mass market. The Energy Commission estimates that the nonresidential Standards may result in an incremental construction cost of \$45,000 for a 15,000 square foot building, less than 2% of typical construction costs for this building size. This estimate is also substantially higher than what will likely be realized, due to the fact that this cost estimate includes all proposed changes to the nonresidential Standards, but an individual building built under these Standards will not need to include every new efficiency measure in the proposed Standards. Table 1 below summarizes the expected costs and net present value energy bill savings for all new homes and buildings expected to be permitted in 2014.

Table 1. Summary of Statewide Costs and Energy Bill Savings

Sector	Statewide Measure Costs	Statewide Energy Bill Savings	Statewide Net Savings
Residential	\$132.46 Million	\$319.77 Million	\$187.31 Million
Nonresidential	\$1.08 Billion	\$1.37 Billion	\$285.29 Million
Total	\$1.21 Billion	\$1.68 Billion	\$472.60 Million

ASSESSMENT OF THE EFFECTS OF THE PROPOSED STANDARDS ON JOBS AND BUSINESS EXPANSION, ELIMINATION, OR CREATION

The Energy Commission has made a preliminary assessment on whether, and if so to what extent, the proposed Standards will affect the following:

- A. The creation or elimination of jobs within the State of California.

Jobs will not be eliminated. It is possible that new jobs may be created as a result of the new compliance procedures. In addition, because the Standards will save hundreds of millions of dollars in energy costs, there will be more money in the economy that can be used for job creation.

- B. The creation of new businesses or the elimination of existing businesses within the State of California.

Businesses will not be eliminated. It is possible that new businesses will be created to provide field verification and other compliance services, and to supply energy efficiency products.

- C. The expansion of businesses currently doing business with the State of California.

It is likely that businesses currently doing business in California to provide compliance-related services and energy-efficiency products will be expanded.

- D. Benefits of the proposed standards to the health and welfare of California residents, to worker safety, and to the state's environment.

The proposed Standards modify existing field verification tests, add new verification tests, and add new equipment specifications that will improve ventilation system installations and operations. This will benefit the health and welfare of building occupants, who are typically California residents, as well as workers in these buildings. The proposed Standards should have no effect on worker safety. The increases in energy and water efficiency stringency in the proposed Standards will benefit California's environment by reducing the consumption of natural resources and the greenhouse gas emissions that the use of these resources generate.

INITIAL DETERMINATION OF SIGNIFICANT EFFECT ON HOUSING COSTS

The Energy Commission has made an initial determination that the proposed Standards would have a significant effect on housing costs. The initial costs of housing construction will rise, but homeowners and occupants will be the beneficiaries of energy bill savings substantially in excess of the initial costs, so the net result will be making housing more affordable.

CONSIDERATION OF ALTERNATIVES

The Energy Commission has made a preliminary determination that no reasonable alternative considered by it, or that has otherwise been identified and brought to its attention, would be more effective in carrying out the purpose of the proposed Standards or would be effective (and cost-effective) as, and less burdensome to affected private persons than, the proposed Standards.

A rulemaking agency must determine in the Final Statement of Reasons that no reasonable alternative considered by the agency or that has otherwise been identified and brought to the attention of the agency would be more effective in carrying out the purpose for which the action is proposed, would be as effective and less burdensome to affected private persons than the proposed action, or would be more cost-effective to affected private persons and equally effective in implementing the statutory policy or other provision of law.

AVAILABILITY OF RULEMAKING DOCUMENTS

All of the information on which the proposed Standards are based is contained in the rulemaking file, which is available for public review at the Commission's Dockets Office, by contacting the persons named below, or on this website:

www.energy.ca.gov/title24/2013standards/rulemaking

If the proposed Standards are adopted, then interested parties may obtain a copy of the Final Statement of Reasons once it has been prepared by going to this website, or by making a written request to the contact person named below.

ENERGY COMMISSION CONTACT PERSON FOR PROCEDURAL AND ADMINISTRATIVE QUESTIONS

Questions on procedural and administrative issues should be addressed to:

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If Mr. Shirakh is not available, contact:

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PUBLIC PARTICIPATION

For assistance in participating in the rulemaking proceeding, please contact the Energy Commission's Public Adviser's Office, at (916) 654-4489, toll free at (800) 822-6228, or by email at pao@energy.ca.gov.

If you have a disability and require special accommodations to attend or participate in a hearing, please contact Lou Quiroz at (916) 654-5146 five days before the hearing.

FINAL STATEMENT OF REASONS

If the proposed amendments are adopted, the Energy Commission will prepare a Final Statement of Reasons. This document will update the Initial Statement of Reasons and respond to public comments. This document can be obtained after the conclusion of the rulemaking by contacting Ron Yasny at (916) 651-2915 or by email at ryasny@energy.ca.gov.

WEBSITE INFORMATION

This NOPA, the Initial Statement of Reasons, the Express Terms, any 15-day language issued subsequently, and all other relevant rulemaking documents can be accessed at the Energy Commission's website at:
www.energy.ca.gov/title24/2013standards/rulemaking/

Mail Lists: 50, 52, 53, and 480

Mailing Date: February 24, 2012