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BLUEPRINT

California Energy Commission
Efficiency Division

In This Issue

2016 Energy Standards Approved

The California Energy Commission (Energy Commission) unanimously approved the 2016 Building Energy Efficiency Standards (Energy Standards), except the nonresidential lighting alterations language, at the June 10, 2015 Business Meeting. The 2016 Energy Standards will reduce energy costs, save consumers money, and increase comfort in new and upgraded homes and other buildings.

Single family homes built with the Energy Commission's 2016 Energy Standards will use about 28 percent less energy for lighting, heating, cooling, ventilation, and water heating than those built to the 2013 Energy Standards.

The 2016 Energy Standards, which take effect on January 1, 2017, focus on three key areas: updating residential requirements to move closer to California's zero net energy goals; updating nonresidential and high-rise residential requirements; and improving the clarity and consistency of existing regulations. Based on a 30-year mortgage, the Energy Commission estimates the 2016 Energy Standards will add about $11 per month for the average home, but will save consumers $31 on monthly heating, cooling, and lighting bills.

In addition to simplifying the language, other major improvements include:

Residential

- High performance attics: extra insulation at the roof deck in addition to ceiling insulation will reduce the attic temperature by 35 degrees or more on hot summer days.
- High performance walls: builders can choose from different wall assemblies to reduce heating and cooling needs in the home year round.
- Lighting: installation of high quality lighting with controls that nearly halve the energy required for lights in new homes.
- Water heating: installation of tankless water heaters that reduce energy use by about 35 percent.

Nonresidential

- Envelope: revision of envelope requirements for all nonresidential and high-rise residential buildings.
- Lighting: update power for lights to align with the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) standards. This allows for the installation of newer, more efficient luminaires which are widely available and commonly used for outdoor lighting applications.
- Elevators: require controls to shut off lights and fans when an elevator is empty. Installation of these controls enables communication with building energy management systems, allowing managers to tailor the building's energy demands and prevent waste.
- Escalators and moving walkways: require controls on escalators and moving walkways in transit areas to run at a lower, less energy-consuming speed when not in use.
- Windows and doors: require interlock controls that turn off cooling and heating systems if a door or window is left open for more than five minutes. This allows occupants to take advantage of outside temperatures and save on heating and cooling costs.

For more information about the 2016 Energy Standards, view the **frequently asked questions** and **infographic**.

Please note that Sections 141.0(b)2I, J, K, and L, related to nonresidential lighting alterations, were not adopted at the June 10, 2015 Business Meeting. Adoption of these sec-

tions is scheduled for consideration at the August 12, 2015 Business Meeting. For additional information on the adoption of these sections, please visit: **http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/#15day**.

Alpha Versions of CBECC 2016 Now Available

Alpha versions of both **CBECC-Res 2016** and **CBECC-Com 2016** are now available for download from their respective project websites. These versions incorporate the 2016 Energy Standards that were adopted at the June 10, 2015 Business Meeting.

These versions were released for research purposes only and allow interested parties to review the implementation of the 2016 Alternative Calculation Method (ACM) Residential and Nonresidential Reference Manuals for newly constructed buildings only. These alpha versions may not be used for compliance, and do not include analysis for existing, addition, or altered components.

CBECC-Res 2016

CBECC-Res 2016 includes the following features:

» 2016 time dependent value (TDV) energy use adjustment factors

» 2016 energy efficiency measures (opaque surfaces; windows; heating, ventilation, and air conditioning (HVAC) systems; and domestic hot water equipment)

» 2016 photovoltaic (PV) credit

If you need general help with the alpha version of CBECC-Res, please check the CBECC-Res **FAQ**, **Quick Start Guide** and **User Manual**. The Quick Start Guide and User Manual can also be accessed by clicking on the program's Help menu.

For technical assistance with the software, please email CBECC-Res support at: **cbecc.res@gmail.com**.

CBECC-Com

CBECC-Com 2016 includes the following features:

» 2016 time dependent value (TDV) energy use adjustment factors

» 2016 opaque envelope U-factor requirements

» 2016 lighting power densities to the space function data table

» 2016 changes to HVAC equipment design efficiency

» Changed baseline for non-recirculating residential water heating systems to instantaneous gas water heaters

» Correction of metal building roof U-factor based on changes to Reference Joint Appendix 4

For general help with the alpha version of CBECC-Com, please check the CBECC-Com **FAQ**. The Quick Start Guide and User Manual can be accessed by clicking on the program's Help menu.

For technical assistance with the software, please email CBECC-Com support at: **cbecc.com@gmail.com**.

CBECC-Com Version 3c

CBECC-Com Version 3c, with more than 40 updates, is now available for download. CBECC-Com is the public domain modeling software used by architects, building designers, energy consultants, and engineers to demonstrate performance compliance with the nonresidential requirements of the 2013 Energy Standards. In response to feedback from the building industry, Version 3c offers increased functionality. Some of the most important changes include:

» Updates to the minimum equipment efficiencies used to calculate the standard budget for certain A/C and heat pumps.

» New HVAC systems allow the fan to be cycled based on space temperature for high rise residential buildings with naturally ventilated spaces.

» Water heating calculations in high-rise residential designs allow for one system for each dwelling unit.

» Removed the mandatory U-factor check for existing assemblies.

» Revised PRF-01 report signature block to improve usability.

Options For Demonstrating Compliance

All permit applications submitted on or after August 17, 2015, which are modeled using CBECC-Com, must use Version 3b or Version 3c. Versions 3 and 3a of CBECC-Com will expire and may not be used for permit applications submitted on or after August 17, 2015.

Additional information regarding approved computer compliance programs can be viewed at: **http://www.energy.ca.gov/title24/2013standards/2013_computer_prog_list.html**.

Water Heater Energy Factor Reference Guide

The Energy Commission has developed a Minimum Water Heater Energy Factor Reference Guide. This guide serves as a tool to help quickly identify the minimum energy factor (EF) required for water heaters. This guide also includes the minimum EFs and other important information regarding the installation of heat pump water heaters for residential prescriptive alterations. The Minimum Water Heater Energy Factor Reference Guide is available at: **http://www.energy.ca.gov/title24/2013standards/documents/water_heater_efficiency_guide.pdf**.

CALCTP Lighting Controls Certificates of Acceptance

On June 10, 2015, the executive director of the Energy Commission approved the use of four third-party Certificates of Acceptance: NRCA-LTI-02-A; NRCA-LTI-03-A; NRCA-LTI-04-A; and NRCA-LTO-02-A. These Certificates of Acceptance were developed by the California Advance Lighting Controls Training Program (CALCTP), a Commission-approved Lighting Controls Acceptance Test Technician Certification Provider (ATTCP).

All enforcement agencies with the authority to issue building permits may accept these Certificates of Acceptance to verify compliance with the lighting control acceptance testing requirements of **Section 130.4** of the Energy Standards.

For more information on the ATTCP program, please visit the Energy Commission's website at: **http://energy.ca.gov/title24/attcp/**.

Q&A

Natural Ventilation

If a high-rise residential building has a space that is too large to comply with the natural ventilation outdoor air requirements, can the naturally ventilated area be deducted from the total area of the space, and the remaining space ventilation outdoor air requirements be fulfilled using mechanical ventilation?

It depends. Please see the two examples below.

Example 1: Given a 30'x30' high-rise residential dwelling space (Figure 1), if an operable wall opening to the outdoors (window) is used to comply with natural ventilation's 25' requirement, can the remaining space's outdoor air ventilation compliance requirement be fulfilled by mechanically ventilating the remaining 5'x30' space?

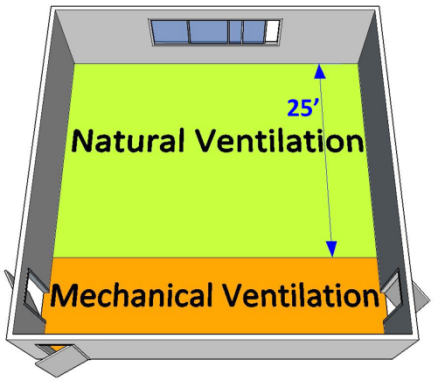

Figure 1 - 30'x30' space, no dividing wall

No. In this case, mechanical ventilation is required for the entire 30'x30' space.

Example 2: Continuing from the previous example, if the total space contains a room that can be closed off from the remainder of the space and there is a wall located at a maximum of 25' from the window, (Figure 2) can the remaining space be mechanically ventilated?

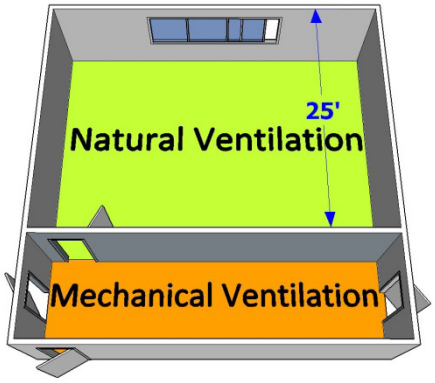

Figure 2 - 30'x30' space, with dividing wall

Yes. Two spaces exist, so two ventilation methods are not being used to ventilate the same space. One enclosed space is within the natural ventilation 25' compliance requirement for outdoor air. In the other space, mechanical ventilation can be used to fulfill the outdoor air compliance requirements.

Bypass Ducts

I am designing a zonally controlled central forced air system. Can the system include bypass ducts?

Yes. However, the performance compliance approach must be used to comply with **Section 150.1(c)13**.

When using performance compliance software, if I report that bypass ducts are used in a zonally controlled central forced air system, is there a compliance budget penalty?

Systems that use bypass ducts usually cannot meet the 350 cfm/ton requirement at the return grille in all zonal control modes, thus for single speed outdoor condensing unit systems, the compliance software makes available input values for system airflow rates of 150 cfm/ton or greater. When less than 350 cfm/ton is modeled, there is a compliance budget penalty applied that increases as the modeled airflow rate value decreases. There is no compliance budget penalty applied for a system that models at least 350 cfm/ton in all zonal control modes.

Heat Pump Water Heating Systems

I want to replace the storage gas water heater at my residence with a heat pump water heating system. Can I do this without having to use the performance compliance approach?

Yes. Heat pump water heating systems can be installed prescriptively for residential single dwelling unit alterations. Per **Section 150.2(b)1Giv**, the Energy Commission used the performance compliance approach to determine the minimum EF needed to be able to prescriptively replace an existing water heater with a heat pump water heating system. Because the performance compliance approach was used, the EF is climate zone dependent. Heat pump water heating systems that meet the minimum required EFs can replace an existing water heater regardless of the original fuel type (natural gas, liquefied petroleum gas, or electric).

Please view the **Minimum Water Heater Energy Factor Reference Guide** to determine the minimum EF needed for each climate zone.

For More Information

Acceptance Test Technician Certification Provider Program:
http://www.energy.ca.gov/title24/attcp/

Approved Computer Compliance Programs:
http://www.energy.ca.gov/title24/2013standards/2013_computer_prog_list.html

Home Energy Rating System:
http://www.energy.ca.gov/HERS/

The California Energy Commission welcomes your feedback on Blueprint. Please contact Andrea Bailey at: Title24@energy.ca.gov.

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Need Help? Energy Standards Hotline
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