

Energy Code for ADUs

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Presenter



Christopher Olvera is the supervisor of the California Energy Commission's Outreach and Education Unit. He has over 15 years of experience working at the Energy Commission. He began work as a student on the Energy Standards Hotline, and has served in several other positions supporting a variety of programs, including: Home Energy Rating System (HERS), Acceptance Test Technician Certification Provider (ATTCP), low interest Energy Conservation Assistance Act (ECAA) loans, Bright Schools, and Clean Energy Jobs Act (Proposition 39).



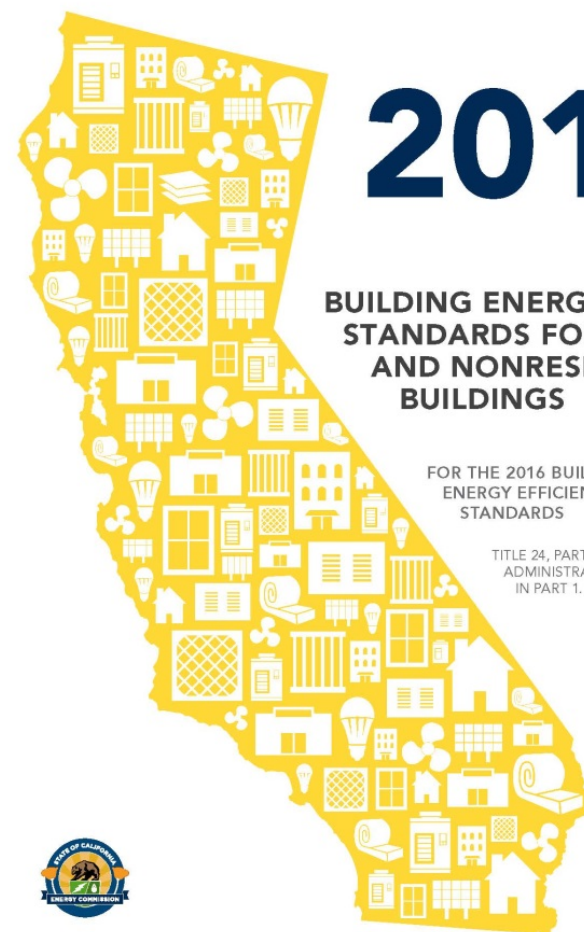
Goals

- Define additions vs. newly constructed buildings per the Energy Code
- Clarify when an ADU is an addition or a newly constructed building
- Specify the prescriptive requirements for additions
- Identify workarounds for modeling additions under the performance approach



Current Energy Code

- **2016 Building Energy Efficiency Standards**
 - Title 24, Part 6 (Energy Code)
 - In effect since January 1, 2017
- **ADUs:**
 - Within the scope of Part 6
 - Requirements will depend on construction/project type





What is an ADU?

- **Accessory Dwelling Unit**

- A secondary dwelling unit on a residential lot
- Can be attached, detached, a conversion
- Living space for another “family”

- **Also referred to as:**

- In-Law unit
- Granny unit/flat





Other ADUs

- **Covered by Part 6**
 - JADUs
 - Efficiency units
- **NOT covered by Part 6**
 - HUD labeled/HCD regulated housing
 - Manufactured/factory-built homes
 - Mobile homes





Energy Code Definitions

- **Newly constructed building**
 - A building that has never been used or occupied for any purpose
- **Addition**
 - Any change to a building that increases conditioned floor area and conditioned volume
 - **Newly conditioned space** – any space being converted from unconditioned to directly or indirectly conditioned space. Newly conditioned spaces must comply with the requirements for an addition.
- **Alterations**
 - Any change to a building's water-heating, space-conditioning, lighting, or electrical power distribution systems, or envelope that is not an addition.



Defining ADUs

- **Detached** – separate from the existing dwelling, no common wall shared
 - Newly constructed building, or an addition (newly conditioned space)
- **Attached** – connected to the existing dwelling by a common wall
 - Addition (traditional) or as newly conditioned space
- **Conversion of existing space**
 - Addition (as newly conditioned space), or an alteration



Scenario I



- Converting an existing attached unconditioned structure (like a garage) to an ADU
- Is this ADU an addition or a newly constructed building?
 - This is an addition (as newly conditioned space)



Scenario II

- A new ADU is built sharing a common wall with an existing home
- Is this ADU an addition or a newly constructed building?
 - This is an addition (traditional)





Scenario III

- Converting an existing detached unconditioned structure to an ADU
- Is this ADU an addition or a newly constructed building?
 - This is an addition (as newly conditioned space)





Scenario IV

- An ADU is built new and is detached from the existing home
- Is this ADU an addition or a newly constructed building?
 - This is a newly constructed building





Scenario V

- Converting existing conditioned space (i.e. a conditioned basement) into an ADU
- Is this ADU an addition or a newly constructed building?
 - Neither! This is an alteration.
 - Compliance may be triggered only if altering water-heating, space-conditioning, or lighting systems, or envelope



Addition Requirements

Envelope

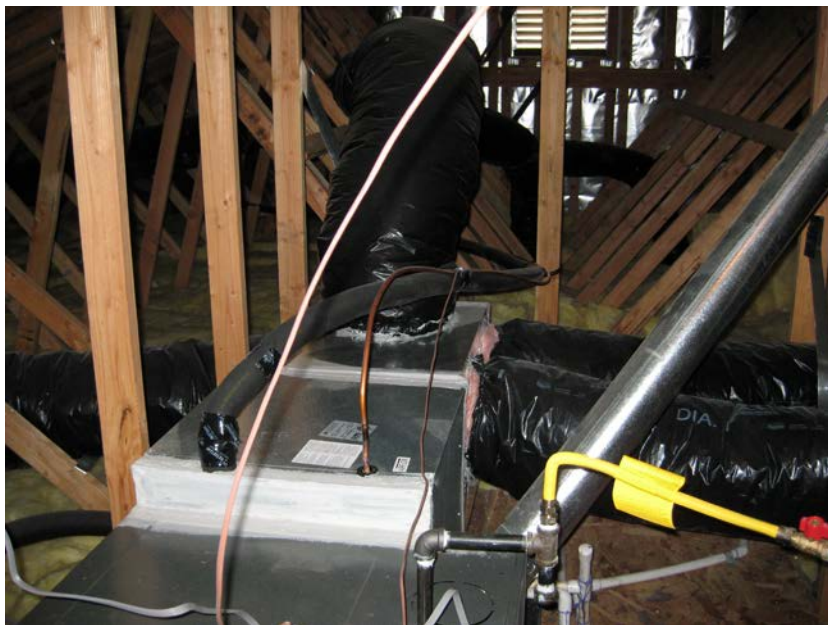
- Additions $\leq 700 \text{ ft}^2$ have less stringent requirements:
 - Meet mandatory R-22 ceiling insulation (HPA not required)
 - Extension of wood frame walls allowed to be same dimensions
 - Existing walls (Scenarios I & III) treated as wall extensions
 - Cool roof not required for additions $\leq 300 \text{ ft}^2$
 - Climate Zones 2, 4, and 6–16
 - Allowed 60 ft^2 of west facing fenestration
 - For additions $\leq 700 \text{ ft}^2$ and $> 400 \text{ ft}^2$, total allowed fenestration is greater of: 120 ft^2 or 25% of CFA
 - For additions $\leq 400 \text{ ft}^2$, total allowed fenestration is greater of: 75 ft^2 or 30% of CFA



Addition Requirements *cont.*

HVAC

- New space-conditioning systems (ducting and equipment)
 - Insulation
 - HERS testing
 - Filtration
- Ventilation (ASHRAE 62.2)
 - Local
 - Whole building (newly constructed buildings, and additions > 1,000 ft²)





Addition Requirements *cont.*

Water Heating

- Gas or propane instantaneous $\leq 200,000$ Btu/hr
- Gas or propane storage $\leq 105,000$ Btu/hr
 - Requires QII and/or other HERS
- Electric or heat pump allowed only if no natural gas is connected to the building





Addition Requirements *cont.*

Lighting

- Newly installed/replaced hardwired lighting, indoor and outdoor, must be high efficacy
 - Table 150.0-A or JA8-2016
- JA8-2016-E required for:
 - Light sources in recessed downlights and enclosed luminaires
- JA8 light sources must have a dimmer or vacancy sensor





Performance Approach

- May be used to demonstrate compliance for ADUs
- Standard design based on:
 - Addition alone: newly constructed building (150.1)
 - E+A+A: addition requirements detailed earlier (150.2)
- Trade offs are permissible, but not for mandatory measures



Workaround I

Modeling wall extensions (& detached ADU walls)

- Remember, including Scenarios I & III
- Require R-15 for 2x4, and R-19 for 2x6
 - No continuous insulation
- BUT, model as HPW
 - Climate zones 1 -5, & 8-16
 - $U-0.051 = R-19$ in 5½ in. cavity (2x6 @ 16 in. O.C.), R-5 sheathing, synthetic stucco
 - Climate zones 6, 7
 - $U-0.065 = R-15$ (2x4 @ 16 in. O.C.), R-3.8 sheathing, synthetic stucco



Workaround II

Modeling E+A+A for detached ADUs

- This approach requires a connection (wall) between the existing building and addition
- Need to create 1 ft² of interior wall

Interior Wall Data

Currently Active Wall: Hypothetical Wall

Interior Wall Name: Hypothetical Wall

Belongs to Zone: House

☐ Is a Party Surface

Zone on Other Side: Addition

Construction: Interior R0

Wall Area: 1 ft²



Modeling Questions?

Please email them to:

- CBECC-Res
 - cbecc.res@gmail.com
- EnergyPro
 - support@energysoft.com
- Wrightsoft Right-Energy Title 24
 - support@wrightsoft.com



ADU Resources

- **HCD**

- <http://www.hcd.ca.gov/policy-research/AccessoryDwellingUnits.shtml>

- **CBECC Software FAQs**

- http://www.bwilcox.com/BEES/docs/CBECC-Res_FAQs.pdf

- **ECA Decoding ADUs Training & Handout**

- <https://energycodeace.com/content/training-ace/courseId=23941>

- **ECA “Coffee & Code” ADU Training**

- <https://energycodeace.com/content/training-ace/courseId=23809>



Online Resource Center (ORC)

Online Resource Center

The Online Resource Center is provided to assist the building community and enforcement agencies with Building Energy Efficiency Standards (Energy Standards) compliance. Energy Standards apply to newly constructed buildings, as well as additions and alterations for existing buildings. Presently, the Energy Standards are updated every three years.

To assist in the compliance process, we provide compliance documents and free Public Domain Compliance Software programs for commercial and residential buildings. Training and links to the Energy Standards and compliance software are available on the Energy Commission website and at utility training centers throughout the state. To help direct you to an appropriate resource, Energy Commission and external resource information are provided on this page.

Building Energy Efficiency Standards



2016
Energy Standards



2013
Energy Standards



Past
Energy Standards

Energy Standards Information and Training Materials



Overview



Commissioning



Covered Processes

Follow



Energy Standards Questions?

[Energy Standards Hotline](#)

Energy Standards Booth Handouts

[Handouts - 02212017 \(zip file, 507 mb\)](#)

[Help with the zip file](#)

Forms

[2016 Residential Compliance Forms](#)

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Blueprint

- Email Newsletter
- Published quarterly
- Clarifications on frequently asked questions

Issue 113 | March - April 2016

BLUEPRINT

California Energy Commission
Efficiency Division

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New Mechanical Acceptance Test Technician Certification Provider

On January 13, 2016, the California Energy Commission (Energy Commission) approved the National Environmental Balancing Bureau (NEBB), as a mechanical Acceptance Test Technician Certification Provider (ATTCP).

This gives NEBB the authority to train, certify, and oversee acceptance test technicians (ATTs) and their employees. NEBB will train and certify ATTs to perform all 17 mechanical acceptance tests required in the 2013 *Building Energy Efficiency Standards* (Energy Standards).

The Conditions of Approval are available for review in the **Executive Director's recommendation**.

For more information, please visit:
<http://energy.ca.gov/title24/attcp/>.

Small Duct High Velocity Space Conditioning Systems

Small duct high velocity (SDHV) systems may be used to comply with the Energy Standards. The following is a list of requirements with direction on how SDHV systems can comply with the low-rise residential requirements of the Energy Standards.

Mandatory Requirements

United States Department of Energy Standards:

SDHV systems manufactured on or after January 23, 2006, and before January 1, 2015, must have a minimum Seasonal Energy Efficiency Ratio (SEER) of 11, and a minimum Heating Seasonal Performance Factor (HSPF) of 6.8.

SDHV systems manufactured on or after January 1, 2015, must have a minimum SEER of 12, and a minimum HSPF of 7.2.

Energy Standards:

Section 150.0(m)13B - Single zone systems that use forced air ducts to supply cooled air to an occupiable space must either meet minimum airflow and fan efficacy requirements, or meet the return duct and grille sizing requirements of **TABLES 150.0-C or 150.0-D**.

NOTE: The return duct and grille sizing alternative will likely be the method chosen for compliance when installing a SDHV system.

Section 150.0(m)15 - Specific to systems with multiple thermostatically controlled zones, this section requires the same mandatory airflow and fan efficacy requirements as **Section 150.0(m)13B**. However, it does not have the same duct and grille sizing alternative. If such systems cannot satisfy the airflow and fan efficacy requirements of this section, compliance must be demonstrated via the performance approach.

The duct leakage and insulation requirements apply as with any other system.

Prescriptive Requirements

The refrigerant charge and duct insulation requirements apply as with any other system.



E-Mail Lists

- Receive updates on the Energy Standards
- Sign up
 - www.energy.ca.gov/listservers/
- Subscribe to the following Efficiency Lists
 - Building Standards
 - Blueprint
- Respond to confirmation email within 24 hours



Energy Standards Hotline

- Open Monday through Friday
8:00 a.m. to 12:00 p.m. and 1:00 p.m. to 4:30 p.m.
- Call
800-772-3300 (in CA)
916-654-5106 (outside CA)
- Email
Title24@energy.ca.gov