Proposal Summary

2022 California Energy Code (Title 24, Part 6)

Multifamily Indoor Air Quality - Kitchen Range Hood Capture Efficiency Requirement

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Introduction

The document summarizes proposed revisions to the California Energy Code (Title 24, Part 6) that will be discussed during a utility-sponsored stakeholder meeting on March 25, 2020. The Statewide Utility Codes and Standards Enhancement (CASE) Team is seeking input and feedback. To provide your comments, email info@title24stakeholders.com.

Measure Description

Current requirement: California's 2019 Title 24, Part 6 standards require that dwelling units meet all requirements of ASHRAE Standard 62.2, except where specified. One of the requirements in ASHRAE Standard 62.2 is that non-enclosed kitchens include intermittent kitchen exhaust with an airflow of at least 100 cubic feet per minute (cfm) and a sound rating of less than or equal to three sones.

Proposed requirement and Rationale: The proposed requirement maintains the existing requirement and adds a new requirement to better ensure that a range hood can adequately remove cooking-related pollution. Specifically, the proposal builds upon recent research from Lawrence Berkeley National Laboratory (LBNL) indicating that at least 75 percent range hood capture efficiency is needed to maintain fine particulate matter (PM2.5) and nitrogen dioxide (NO2, for natural gas-fueled range hoods) at acceptable levels specified by U.S. Environmental Protection Agency standards. Both pollutants – and particularly PM2.5 – have been linked to numerous health problems. While a requirement based exclusively on capture efficiency would be the most direct approach to address IAQ, manufacturers have not yet published the capture efficiency of their equipment, so there is little market data regarding capture efficiency of available products. LBNL research has found a relationship between airflow and capture efficiency (i.e., a higher airflow generally results in a higher capture efficiency). Consequently, this proposal provides alternative pathways that include a minimum capture efficiency and minimum airflow.

Draft Code Language

The Energy Commission plans to create a multifamily chapter for inclusion in 2022 Title 24, Part 6. The multifamily chapter will draw from the appropriate sections of the 2019 residential and nonresidential Standards. The Statewide CASE Team uses the language and section numbering from residential and

nonresidential Standards and Reference Appendices to show the proposed changes below. Changes to the 2019 documents are marked with red underlining (new language) and ~~strikethroughs~~ (deletions). Expected sections or tables of the proposed code (but not specific changes at this time) are highlighted in yellow.

For this submeasure:

- Black is current language in 2019-Title 24 part 6.
- Purple is from ASHRAE standard 62.2-2016, so required in 2019-Title 24 part 6 by reference
- Red is new proposed language

Standards

100.1 Definitions and Rules of Construction

ASTM E3087-18 is the American Society of Testing and Materials document titled "Standard Test Method for Measuring Capture Efficiency of Domestic Range Hoods", 2018

kitchen, enclosed: a kitchen whose permanent openings to interior adjacent spaces do not exceed a total of 60 ft2 (6 m2)...

Draft language for high-rise dwelling units

Section 120.1(b) High-rise Residential Buildings

…

2. Attached dwelling units. All dwelling units shall meet the requirements of ASHRAE Standard 62.2, Ventilation and Acceptable Indoor Air Quality in Residential Buildings, subject to the amendments specified in subsection A below. All dwelling units shall comply with the Acceptance requirements specified in subsection B below.

…

Section 120.1(b)2Avi. A local mechanical exhaust system shall be installed in each kitchen meeting the requirements of section a and b below.

a. Kitchen exhaust systems ~~range hoods~~ shall be rated for sound in accordance with Section 7.2 of ASHRAE 62.2.

EXCEPTION to Section 120.1(b)2Avii: Kitchen range hoods may be rated for sound at a static pressure determined at working speed as specified in HVI 916 Section 7.2.

b. Single family dwelling unit exhaust system shall meet the requirements of ASHRAE 62.2. Multifamily exhaust systems in non-enclosed kitchens must meet 1, 2, or 3 below, and multifamily exhaust systems in enclosed kitchens must meet 1, 2, 3, or 4 below:

1. A vented range hood with at least one speed setting with a minimum capture efficiency of 70 percent, in accordance with ASTM E3087-18, measured at the nominal installed airflow described in HVI 920; or

2. A vented range hood with at least one speed setting with a minimum airflow of ~~100~~ 250 cfm at 25 Pa (0.1 inches w.c.) or higher; or

3. A vented downdraft kitchen exhaust fan with at least one speed setting with a minimum airflow of 300 cfm at 25 Pa (0.1 inches w.c.) or higher; or

4. Continuous exhaust system with a minimum airflow equal to five kitchen air changes per hour.

Additions would need to follow proposed language for new construction. The Statewide CASE Team proposes to add "or ventilation" system in the new multifamily chapter to the list of newly installed equipment that must meet requirements.

Section 141.0

Additions, alterations, and repairs to existing nonresidential, high-rise residential, and hotel/motel buildings, existing outdoor lighting for these occupancies, and internally and externally illuminated signs, shall meet the requirements specified in Sections 100.0 through 110.10, and 120.0 through 130.5 that are applicable to the building project, and either the performance compliance approach (energy budgets) in Section 141.0(a)2 (for additions) or 141.0(b)3 (for alterations), or the prescriptive compliance approach in Section 141.0(a)1 (for additions) or 141.0(b)2 (for alterations), for the Climate Zone in which the building is located.

…

141.0(a) Additions

(a) Additions. Additions shall meet either Item 1 or 2 below.

1. **Prescriptive approach.** The envelope and lighting of the addition; any newly installed space-conditioning or ventilation system, electrical power distribution system, or water-heating system; any addition to an outdoor lighting system; and any new sign installed in conjunction with an indoor or outdoor addition shall meet the applicable requirements of Sections 110.0 through 120.7, 120.9 through 130.5, and 140.2 through 140.9.
2. **Performance approach.**

A. The envelope and indoor lighting in the conditioned space of the addition, and any newly installed space-conditioning or ventilation system, electrical power distribution system, or water-heating system, shall meet the applicable requirements of Sections 110.0 through 120.7, 120.9 through 130.5; and

…

Alterations would not need to follow proposed requirement, unless newly installed kitchen ventilation equipment is installed. The Statewide CASE Team proposes to add "ventilation" system in the new multifamily chapter to the list of newly installed equipment that must meet requirements.

141.0(b) Alterations

(b) **Alterations.** Alterations to components of existing nonresidential, high-rise residential, hotel/motel, or relocatable public school buildings, including alterations made in conjunction with a change in building occupancy to a nonresidential, high-rise residential, or hotel/motel occupancy shall meet item 1, and either Item 2 or 3 below:

1. **Mandatory Requirements**. Altered components in a nonresidential, high-rise residential, or hotel/motel building shall meet the minimum requirements in this Section.

…

2. **Prescriptive approach.** The altered components of the envelope, or space conditioning, ventilation, lighting, electrical power distribution and water heating systems, and any newly installed equipment serving the alteration, shall meet the applicable requirements of

Sections 110.0 through 110.9, Sections 120.0 through 120.6, and Sections 120.9 through 130.5.

…

3. Performance approach.

A. The altered envelope, space–conditioning system, ventilation, lighting and water heating components, and any newly installed equipment serving the alteration, shall meet the applicable requirements of Sections 110.0 through 110.9, Sections 120.0 through 120.6, and Sections 120.9 through 130.5.

Alterations would NOT need to follow proposed requirement, unless newly installed ventilation equipment is installed. The Statewide CASE Team proposes to add "ventilation" system in the new multifamily chapter to the list of newly installed equipment that must meet requirements.

141.0(b) Alterations

(b) **Alterations.** Alterations to components of existing nonresidential, high-rise residential, hotel/motel, or relocatable public school buildings, including alterations made in conjunction with a change in building occupancy to a nonresidential, high-rise residential, or hotel/motel occupancy shall meet item 1, and either Item 2 or 3 below:

1. **Mandatory Requirements**. Altered components in a nonresidential, high-rise residential, or hotel/motel building shall meet the minimum requirements in this Section.

…

2. **Prescriptive approach.** The altered components of the envelope, or space conditioning, ventilation, lighting, electrical power distribution and water heating systems, and any newly installed equipment serving the alteration, shall meet the applicable requirements of Sections 110.0 through 110.9, Sections 120.0 through 120.6, and Sections 120.9 through 130.5.

…

3. Performance approach.

A. The altered envelope, space–conditioning system, ventilation, lighting and water heating components, and any newly installed equipment serving the alteration, shall meet the applicable requirements of Sections 110.0 through 110.9, Sections 120.0 through 120.6, and Sections 120.9 through 130.5.

Draft language for low-rise multifamily dwelling units

Section 150.0(o). Requirements for Ventilation and Indoor Air Quality. All dwelling units shall meet the requirements of ASHRAE Standard 62.2, Ventilation and Acceptable Indoor Air Quality in Residential Buildings subject to the amendments specified in Section 150.0(o)1 below.

…

Section 150.0(o)1G. A local mechanical exhaust system shall be installed in each kitchen meeting the requirements of section i and ii below.

i. Kitchen exhaust systems ~~range hoods~~ shall be rated for sound in accordance with Section 7.2 of ASHRAE 62.2.

EXCEPTION to Section 150.0(o)1Gi: Kitchen exhaust systems ~~range hoods~~ may be rated for sound at a static pressure determined at working speed as specified in HVI 916 Section 7.2.

ii. Single family dwelling unit exhaust system shall meet the requirements of ASHRAE 62.2. Multifamily exhaust systems in non-enclosed kitchens must meet a, b, or c below, and multifamily exhaust systems in enclosed kitchens must meet a, b, c, or d below:

a. A vented range hood with at least one speed setting with a minimum capture efficiency of 70 percent, in accordance with ASTM E3087-18, measured at the nominal installed airflow described in HVI 920; or

b. A vented range hood with at least one speed setting with a minimum airflow of ~~100~~ 250 cfm at 25 Pa (0.1 inches w.c.) or higher; or

c. A vented downdraft kitchen exhaust fan with at least one speed setting with a minimum airflow of 300 cfm at 25 Pa (0.1 inches w.c.) or higher; or

d. Continuous exhaust system with a minimum airflow equal to five kitchen air changes per hour.

Additions would need to follow proposed language for new construction. No changes are needed to the language in Section 150.2, since 150.0(o) is already listed as a requirement.

…

Alterations would NOT need to follow proposed requirement, unless newly installed ventilation equipment is installed. No changes needed to language in Section 150.2(b).