

Proposal Summary



Commercial Kitchens

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Introduction

The document summarizes proposed revisions to the California Energy Code (Title 24, Part 6) that were introduced at the stakeholder introductory meeting on October 25, 2022 and will be discussed during a utility-sponsored stakeholder meeting on February 9, 2023. The Statewide Utility Codes and Standards Enhancement (CASE) Team is seeking input and feedback. To provide your comments, email info@title24stakeholders.com by February 23, 2023.

Measure Description

This proposal covers two code changes related to commercial kitchens: demand control kitchen ventilation (DCKV), and all-electric readiness requirements.

Demand Control Kitchen Ventilation (DCKV)

This measure would move existing prescriptive DCKV requirements to the primary prescriptive pathway rather than one of several options. In addition, this measure will consider additional code enhancements to require active-cooking sensors (such as infrared (IR) sensors for smoke or status relay directly from the appliance) to ensure the actualization of full savings potential of DCKV hoods.

Kitchen Electrification Readiness Requirements

This measure would require that certain new kitchens have the proper electrical infrastructure to convert to a future electrified cookline. This effort involves developing definitions of commercial kitchen types (quick service restaurant, full-service restaurant, institutional, etc.) to create specific electrical readiness requirements based on the type of commercial equipment.

The 2022 code cycle saw mandatory electric readiness requirements added to the multifamily portions of the code (Section 160.9, Title 24, Part 6). This measure leverages similar rationale to the commercial kitchen environment. Due to the considerable barriers to electrify commercial kitchen appliances (fryers, ranges, ovens,



etc.) from the cost to upsize the electrical infrastructure (electrical service panels, transformers, switch gear, etc.) and the costly disruptions to add electrical wiring in the commercial kitchens, this proposal will look to ensure that systems have the requisite infrastructure to convert their appliances to electric in the future.

1.1 Data Needs/Stakeholder Information Requests

1.1.1 Demand Control Ventilation (DCKV)

- Differences in technical feasibility and airflow for makeup air systems, as the sensors behave very differently under electric vs. gas stoves.
 1. What percent of new kitchen hood projects have DCKV controls specified?
 2. What is the typical total exhaust air flow rate (cfm) across all kitchen hoods?
- Which prescriptive option is typically chosen over DCKV?
 1. Are these alternative options specific to a sector type (i.e., quick service, full service, schools, hotels)
- First Costs and Operational Costs
 1. What is the typical cost of the baseline option – the prescriptive option typically followed when DCKV is not chosen?
 2. Are there any additional operational costs for DCKV controls?
- Prevalence of DCKV in cafeterias. How often are they installed in schools?
 1. Do operational costs differ due to school schedule?
 2. What is the prevalence of DCKV across primary, secondary, and post-secondary schools?
- How often is the prescriptive approach used versus the performance based approach in kitchen with DCKV?
 1. Does sector impact this ratio?
- Market data 2019 – present.

1.1.2 Kitchen Electrification

- What foodservice business type do you think is most ready for becoming all-electric?
- Which equipment types are customers least inclined to switch to electric from gas?
- Which equipment types are customers most inclined to switch to electric from gas?
- What trends are you seeing in the market towards electrification?

Data may be provided anonymously. To participate or provide information, please email Kiri Coakley (kcoakley@energy-solution.com) directly and cc info@title24stakeholders.com.

Draft Code Language

The proposed changes to the Standards and Reference Appendices are provided below. Changes to the 2022 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**.

1.1.3 Demand Control Kitchen Ventilation (DCKV)

SECTION 140.9 – Prescriptive Requirements for Covered Processes [a-c]

(b) Prescriptive Requirements for Commercial Kitchens.

1. Kitchen exhaust systems.

A. Replacement air introduced directly into the hood cavity of kitchen exhaust hoods shall not exceed 10 percent of the hood exhaust airflow rate.

B. For kitchen/dining facilities having total Type I and Type II kitchen hood exhaust airflow rates greater than 5,000 cfm, each type I hood shall have an exhaust rate that complies with TABLE 140.9-A. If a single hood or hood section is installed over appliances with different duty ratings, then the maximum allowable flow rate for the hood or hood section shall not exceed the TABLE 140.9-A values for the highest appliance duty rating under the hood or hood section. Refer to ASHRAE Standard 154-2011 for definitions of hood type, appliance duty and next exhaust flow rate.

EXCEPTION 1 to Section 140.9(b)1B: 75 percent of the total Type I and Type II exhaust replacement air is transfer air that would otherwise be exhausted.

EXCEPTION 2 to Section 140.9(b)1B: Existing hoods not being replaced as part of an addition or alteration.

TABLE 140.9-A MAXIMUM NET EXHAUST FLOW RATE, CFM PER LINEAR FOOT OF HOOD LENGTH

Type of Hood	Light Duty Equipment	Medium Duty Equipment	Heavy Duty Equipment	Extra Heavy Duty Equipment
Wall-mounted Canopy	140	210	280	385
Single Island	280	350	420	490
Double Island	175	210	280	385
Eyebrow	175	175	Not Allowed	Not Allowed
Backshelf / Passover	210	210	280	Not Allowed

2. Kitchen ventilation.

A. Mechanically cooled or heated makeup air delivered to any space with a kitchen hood shall not exceed the greater of:

- i. The supply flow required to meet the space heating and cooling load; or
- ii. The hood exhaust flow minus the available transfer air from adjacent spaces. Available transfer air is that portion of outdoor ventilation air serving adjacent spaces not required to satisfy other exhaust needs, such as restrooms, not required to maintain pressurization of adjacent spaces, and that would otherwise be relieved from the building.

EXCEPTION to Section 140.9(b)2A: Existing kitchen makeup air units not being replaced as part of an addition or alteration.

B. A kitchen/dining facility having a total Type I and Type II kitchen hood exhaust airflow rate greater than 5,000 cfm shall include a Demand Ventilation System on at least 75 percent of design exhaust air capable of modulating airflow in response to appliance operation. Such systems shall:

- i. Include controls necessary to modulate airflow in response to appliance operation and to maintain full capture and containment of smoke, effluent and combustion products during cooking and idle; and
- ii. Include failsafe controls that result in full flow upon cooking sensor failure; and
- iii. Include an adjustable timed override to allow occupants the ability to temporarily override the system to full flow; and
- iv. Be capable of reducing exhaust and replacement air system airflow rates to the larger of:
 - a. 50 percent of the total design exhaust and replacement air system airflow rates; or
 - b. The ventilation rate required as specified by Section 120.1(c)3.

B.-C. A kitchen/dining facility having a total Type I and Type II kitchen hood exhaust airflow rate greater than 5,000 cfm shall have one of the following:

- i. At least 50 percent of all replacement air is transfer air that would otherwise be exhausted; or
- ii. Demand ventilation system(s) on at least 75 percent of the exhaust air. Such systems shall:
 - a. Include controls necessary to modulate airflow in response to appliance operation and to maintain full capture and containment of smoke, effluent and combustion products during cooking and idle; and
 - b. Include failsafe controls that result in full flow upon cooking sensor failure; and
 - c. Include an adjustable timed override to allow occupants the ability to temporarily override the system to full flow; and
 - d. Be capable of reducing exhaust and replacement air system airflow rates to the larger of:
 - (i) 50 percent of the total design exhaust and replacement air system airflow rates; or
 - (ii) The ventilation rate required as specified by Section 120.1(c)3.
- ~~iii.~~ ii. Listed energy recovery devices with a sensible heat recovery effectiveness of not less than 40 percent on at least 50 percent of the total exhaust airflow; or
- ~~iv.~~ iii. A minimum of 75 percent of makeup air volume that is:
 - a. Unheated or heated to no more than 60°F; and
 - b. Uncooled or cooled without the use of mechanical cooling.

EXCEPTION to Section 140.9(b)2B: Existing hoods not being replaced as part of an addition or alteration.

3. Kitchen Exhaust System Acceptance. Before an occupancy permit is granted for a commercial kitchen subject to Section 140.9(b), the following equipment and systems shall be certified as meeting the Acceptance Requirements for Code Compliance, as specified by the Reference Nonresidential Appendix NA7. A Certificate of Acceptance shall be submitted to the enforcement agency that certifies that the equipment and systems meet the acceptance requirements specified in NA7.11.

EXCEPTION to Section 140.9(b): healthcare facilities.

1.1.4 Kitchen Electrification Readiness

MANDATORY REQUIREMENTS FOR ELECTRIC READY BUILDINGS

- (a) **Electric cooktop ready.** Commercial kitchen systems using gas or propane cooklines shall include the following:

1. Dedicated 240 volt branch circuit wiring shall be installed within 3 feet from the cooktop and accessible to the cooktop with no obstructions. The branch circuit conductors shall be rated at 50 amps minimum, with total electrical infrastructure allowing the minimum connected amperage listed below by kitchen type. The blank cover shall be identified as “240V ready.” All electrical components shall be installed in accordance with the *California Electrical Code*.

TABLE - Minimum Allowance for Connected Amperage, by Kitchen Type

Category of Kitchen	Minimum Allowance for Connected Amperage
Quick-Service	690
Full-Service	905
Institutional	520

2. The main electrical service panel shall have a reserved space to allow for the installation of a double pole circuit breaker for a future electric cooktop installation. The reserved space shall be permanently marked as “For Future 240V use.”

Exceptions will be included after discussions with stakeholders and will likely be based on kitchen type, for example full-service restaurants.

- i. The electrical power required to provide equivalent functionality of the gas-powered equipment as calculated and documented by the responsible person associated with the project.

NOTE: Authority: Sections 25213, 25218, 25218.5, 25402 and 25402.1, Public Resources Code.

Reference: Sections 25007, 25008, 25218.5 25310, 25402, 25402.1, 25402.4, 25402.5, 25402.8 and

25943, Public Resources Code.

Reference Appendices

To be completed later in the cycle