High-Performance Measure Details

Measure Name
All-Electric Commercial Kitchen

Use Category
ProcDist – Process Electrification

Effective Date
March 2, 2026

End Date
Pending New Version Release in June, 2026

Version
1.2

Measure Code
LM405

Measure Stage
Early Adoption

Table of Contents

Technology Summary

All-electric commercial kitchens replace natural gas-fired cooking and service water-heating equipment with electric alternatives, including induction ranges and cooktops, electric combi ovens and convection ovens, electric griddles and fryers, and electric or heat pump-based water-heating systems. In the context of the California Energy Design Assistance (CEDA) program—which supports electrification, decarbonization, and grid resilience in new construction—this measure represents a comprehensive building-level strategy to eliminate on-site fossil fuel combustion in food service facilities. Commercial kitchens are among the highest energy-use spaces in nonresidential buildings, and they are traditionally dominated by gas-fired appliances due to historic cost and operational familiarity. An all-electric configuration shifts these loads to electricity while requiring coordinated design of cooking equipment, ventilation, electrical infrastructure, and hot water systems.

Electrifying commercial kitchens matters for California's decarbonization goals because cooking and kitchen water heating represent significant direct combustion sources in restaurants, schools, hospitals, and hospitality facilities. Transitioning to electric equipment reduces on-site greenhouse gas emissions and aligns with statewide building electrification policy. Operationally, electric equipment—particularly induction cooking—can improve

controllability, reduce ambient heat gain to kitchen spaces, and potentially lower ventilation and cooling loads when properly integrated with hood systems. However, the energy and demand impacts of electrification depend heavily on equipment selection, load diversity, panel sizing, and peak demand management strategies.

In practice, performance gaps are common. These include undersized electrical infrastructure leading to operational constraints; overestimation of peak coincident demand resulting in unnecessary service upgrades; failure to coordinate ventilation hood sizing with electric equipment heat output; improper hot water sizing due to outdated consumption assumptions; and insufficient operator training that leads to resistance backup use or operational inefficiencies. Without integrated design and verification, projects may experience higher-than-expected demand charges or fail to realize ventilation and cooling load reductions.

Relevant standards and references include the California Energy Code (Title 24, Part 6), the California Plumbing Code and Uniform Plumbing Code Appendix M, CCDEH water heater sizing guidelines, ENERGY STAR equipment specifications, and applicable UL and ETL safety certifications for commercial electric cooking equipment.

Alignment with CEDA Program Goals

The CEDA program supports the implementation of energy efficiency measures that support Code Readiness' Long Term Tactical Plan (LTTP) to drive the goals of electrification, decarbonization, and load reduction.

Projects must meet the CEDA Inducement Requirements identified in the next section to receive an inducement on the equipment and will be evaluated for level of interest in metering to support Code Readiness Objectives.

This measure meets the CEDA program goals as follows:

- **Building partnerships with market stakeholders** by consulting on innovative technologies and best practices in energy efficiency which can lead to the development of more effective solutions and accelerate the adoption of new technologies. As teams adopt the measure, this increases the volume of engineers able to design the equipment, contractors capable of installing the equipment, and owners able to operate the equipment.
- **Increasing the supply of high-performance measures and all-electric buildings** by combining electrification with energy efficiency that can result in projects implementing measures to achieve greater energy savings, reduced emissions, and overall improved building performance. As more buildings specify and install all-electric commercial kitchens, this helps to increase the overall supply of all-electric kitchens in the market for others to use, including beyond new construction.
- **Increasing the demand for high-performance measures and all-electric buildings** by pushing for electrification that drives the need for technological advancements, supporting economic growth opportunities through innovation, and raising awareness of the benefits of electrification to increase consumer adoption. As demand in the market increases for newer technologies, the long-term benefit is increased demand for manufacturers and suppliers to provide additional options available in the market.
- **Advancing new high-performance measure technology** by raising public awareness about new technologies and their benefits, helping build acceptance and demand through market support advocacy efforts that can influence stakeholder decisions that enables technological innovation.
- **Providing Codes & Standards with projects of interest** to collect metered data that will inform future California energy codes.

CEDA Inducement Requirements

Commercial kitchens have historically relied on natural gas-fired cooking and water heating equipment due to lower perceived first costs, established culinary preferences, and familiarity among designers and operators. Fully electrifying commercial kitchens often requires electrical service upgrades, panel capacity increases, ventilation coordination, and updated water heating approaches, which can introduce cost uncertainty and perceived operational risk. In addition, existing water heater sizing guidelines and legacy infrastructure assumptions may not align well with electric or heat pump-based systems. While electric cooking technologies such as induction and electric combi ovens are commercially available and widely deployed in some markets, adoption in large food service facilities remains limited by first-cost premiums, demand charge concerns, and limited contractor experience with integrated electric kitchen design. The CEDA inducement is intended to help bridge this gap by reducing incremental cost risk while advancing field data to inform future code pathways.

Inducement eligibility is determined based on a project's demonstrated contribution to electrification and decarbonization objectives, including avoided on-site natural gas use (therms avoided), projected annual and peak electric energy impacts, and estimated greenhouse gas (CO_2e) emissions reductions relative to a baseline gas-fired kitchen configuration. Additional considerations may include total kitchen load served by electric equipment, gross square footage of the facility, and the project's impact on peak electric demand and load shape. By linking financial support to measurable electrification outcomes and demand impacts, the inducement structure aligns near-term project feasibility with longer-term grid planning and Title 24 code readiness goals.

Eligible Equipment

The project team must certify that all commercial kitchen equipment and all service/domestic hot water systems serving the commercial kitchen are designed and installed to operate using electricity as the sole source of energy.

This measure requires full electrification of the facility's commercial kitchen, including complete electrification of all cooking equipment and the associated service/domestic hot water supply serving the kitchen.

Exception: Projects where the facility's hot water is supplied by a central campus-wide or district-level gas-fired hot water system remain eligible under this measure, provided that all kitchen equipment at the applicant site is fully electric.

Documentation

The project team must provide the following materials for review.

- An inventory of the make and model of kitchen equipment and appliances planned for installation, noting the electrical rating and the anticipated purchase and installation costs per equipment.
- The planned electrical panel schedules for panels serving the kitchen portion of the facility, with subtotal estimates of total connected load and demand factor by category: water heating, kitchen equipment, refrigeration, HVAC, lighting, and others.
- The planned floor plan layout of the kitchen facility, showing the space required to house the electric kitchen equipment.
- The make, model, capacity, and first-hour rating of service hot water equipment that will provide hot water to the facility, with piping plans that identify the water heating equipment that will serve the kitchen portion of the facility.
- If energy storage (electrical or thermal) will be used: A description of any energy storage strategy and design documentation for the energy storage system.
- The make, model, and capacity of ventilation hoods and other ventilation systems that will serve the kitchen portion of the facility.

Incremental Measure Cost

The Incremental Measure Cost (IMC) represents the typical additional first cost associated with installing a fully electrified commercial kitchen—including electric cooking equipment and electric service/domestic hot water systems—relative to a conventional mixed-fuel (gas-fired cooking and gas water heating) baseline design.

The IMC is intended solely for program calibration and inducement-setting purposes. It reflects representative market conditions under typical new construction scenarios and normalized system configurations. The IMC is not intended to function as a contractor bid estimator, detailed takeoff, or project reconciliation tool. Actual project costs will vary based on kitchen program, appliance mix, electrical service conditions, jurisdictional requirements, and equipment selection.

These values support CEDA's market transformation objectives by establishing a consistent and defensible incremental cost reference for fully electrified commercial kitchen systems.

Base Case

The Base Case represents a conventional commercial kitchen designed to meet 2025 Title 24 minimum requirements using a mixed-fuel configuration. The typical baseline includes:

- Gas-fired cooking appliances (ranges, ovens, fryers, griddles, etc.)
- Gas-fired domestic/service hot water system serving the kitchen
- Standard electrical service sized for lighting, refrigeration, small appliances, and controls
- Gas piping, regulators, and venting infrastructure
- Type I and Type II ventilation designed for gas appliance heat output

The Base Case reflects standard market practice where gas infrastructure is available and permitted.

Measure Case

The Measure Case reflects compliance with the All-Electric Commercial Kitchen HPM requirements and includes:

- Replacement of all gas-fired cooking appliances with equivalent electric (induction or resistance) equipment
- Fully electric service/domestic hot water system (e.g., electric resistance or heat pump water heater)
- Electrical distribution upgrades required to support the additional connected load
- Associated branch circuitry, disconnects, and panel capacity increases
- Elimination of gas piping, regulators, and venting infrastructure

Primary incremental cost drivers include electric appliance premiums, electrical infrastructure upgrades, and electrified hot water system premiums, partially offset by avoided gas infrastructure costs.

IMC Values & Normalization

Representative Kitchen Size Class

For program normalization purposes, the representative commercial kitchen size class is defined as:

- 1,000 square feet of kitchen/cooking area (back-of-house only).

This area represents the active cooking and prep footprint served by hoods and major equipment. It does not include dining areas, retail floor area, or total building gross floor area.

Industry practice indicates that most standalone commercial kitchens and institutional kitchens targeted by this Program fall within the 500–1,500 SF range. A 1,000 SF representative kitchen provides a realistic and defensible midpoint for normalization across the majority of eligible projects.

Normalized Unit Selection

Normalized Unit: *$ per square foot (SF) of kitchen/cooking area*

This unit is selected because:

- Major appliance count scales more consistently with kitchen footprint than with total building area.
- Electrical distribution sizing and connected load correlate strongly with equipment density within the kitchen area.
- $/SF provides a consistent, easily verifiable program calibration metric across varying kitchen configurations.

Representative Appliance Mix

A realistic representative 1,000 SF commercial kitchen typically includes approximately five major cooking appliances. For the nominal case, the following equipment mix is assumed:

- 1 × 6-hob induction range = $12,000 estimated incremental cost per appliance
- 1 × electric combi oven = $2,000 estimated incremental cost per appliance
- 1 × electric convection oven = $1,000 estimated incremental cost per appliance
- 1 × 36" electric griddle = $3,500 estimated incremental cost per appliance
- 1 × 50-lb electric fryer vat = $3,500 estimated incremental cost per appliance

IMC Calculation – Nominal Case Representative Cost Anchors

Cost Component	Representative Delta	Basis
Electric cooking equipment premium	+$22,000	Cost premium subtotal for major appliances (induction, combi ovens, etc.)
Electrical infrastructure upgrades	+$20,000	Electrical distribution upgrades (panel capacity, feeders, subpanels)
Electric DHW premium	+$15,000	Electric HPWH or electric resistance system premium vs gas system
Gas infrastructure avoided	–$10,000	Avoided gas piping, regulators, and venting
Net Incremental Cost	**$47,000**	**Rounded representative value**

Normalized IMC

Representative kitchen area = 1,000 SF

IMC = $47,000 / 1,000 SF = $47/SF

- **Proposed HPM IMC (Nominal Value)** = $47 per SF of Kitchen/Cooking Area

The nominal value of $47/SF is recommended for program calibration to reflect a realistic mid-sized commercial kitchen electrification scenario.

Sources

IMC values are informed by a combination of publicly available market pricing, industry cost references, and program experience, and are intended to reflect typical California market conditions rather than project-specific pricing, including:

- For Restaurants Cutting Their Carbon Footprint, Composting Food Scraps Is Just the Beginning | Eater
- Young-2020-Oct-electricification-kitchens.pdf
- 2025_T24_Final-CASE-Report-NR-Kitchens.pdf
- RSMeans Construction Cost Data (Division 11 – Foodservice Equipment; Division 26 – Electrical)
- Manufacturer list pricing and distributor budget quotes for commercial induction, combi ovens, and electric fryers (2023–2025)
- California utility program experience with commercial kitchen electrification projects
- Industry cost references for electrical service upgrades in small commercial facilities
- Market data from institutional and restaurant new construction projects

Code Readiness Objectives

The objectives of Code Readiness site monitoring are to understand the first costs, operating costs, energy usage, peak demand, and indirect benefits associated with the electrification of kitchen equipment. The data gathered from this measure will inform the development of California Title 24, Part 6 requirements for all-electric new construction for one or more types of food service facilities in the 2028 Code Cycle or subsequent Code Cycles.

To support code improvement, the measure aims to gather the following information:

- Information on the first cost of electric kitchen equipment, to assess the cost-effectiveness of commercial kitchen electrification measures.
- Information on the electrical load shapes and peak electric demand of fully electric commercial kitchens.
- Information on additional training requirements required to prepare cook staff and equipment operators for using electric kitchen equipment.
- Information on additional food preparation or process requirements that are required to operate electric kitchen equipment, compared to conventional natural gas equipment.
- Information on kitchen exhaust cubic feet per minute (CFM) requirements and ventilation equipment energy use in fully electric commercial kitchens.
- Post-installation time-series measurements of:
    - Electric power demand for each panel circuit serving kitchen equipment, kitchen HVAC, or kitchen hot water.
    - Hot- and cold-water consumption for the total kitchen.
    - Individual hot- and cold-water consumption for the highest-consuming fixtures and equipment (e.g., food prep and dishwashing stations, automatic dishwashers).
    - Indoor air quality in the kitchen space.

Code Readiness Site Monitoring

If selected for Code Readiness monitoring, equipment energy consumption and mechanical system performance may be monitored on-site for a period of up to 24 months. To support performance evaluation and data collection, projects shall provide reasonable access for the installation and operation of metering, sensors, and communication equipment.

Projects equipped with a Building Automation System (BAS), Energy Management System (EMS), or equivalent platform should enable integration of advanced metering devices through the existing system to facilitate data collection and remote access. For projects without a BAS or EMS, the Code Readiness team may install temporary stand-alone data loggers, sensors, and communication equipment as needed to monitor system performance for the duration of the monitoring period.

Instrumentation may be installed or supplemented, where necessary, to measure key system and equipment parameters sufficient to evaluate system performance and operational characteristics. All monitoring equipment will be temporary and installed in a manner that minimizes disruption to normal building operations.

Data Benefits

Collected data will help support the following:

- Quantify total and end-use electric demand for fully electric commercial kitchens, including load shapes and peak demand impacts.
- Document hot water consumption patterns, fixture-level usage, and implications for service water heating sizing and thermal storage strategies.
- Provide insight into ventilation airflow (CFM), hood system energy use, and potential interactions between electric cooking equipment and kitchen exhaust requirements.
- Assess first costs, operational costs, equipment selection impacts, and market scalability of all-electric kitchen configurations.
- Support potential updates to Title 24, Part 6 requirements, CCDEH water heater sizing guidelines, and commercial cooking ventilation assumptions in future code cycles.

Sample Data Points

A representative set of data points that would ideally be collected is provided below for reference. The final monitoring scope should be project-specific based on available metering infrastructure and program needs.

Data Points to Meter	Unit	Additional Specifications
Kitchen Panel Power	kW	15-min interval; peak and average
Kitchen Panel Energy	kWh	Monthly total
Electric DHW System Power	kW	Interval; peak and average
DHW Thermal Output (calculated)	BTU	From flow × ΔT
DHW System COP (calculated)	COP	Average during operation
Indoor Kitchen Temperature	°F	Average during operating hours
Outdoor Air Temperature	°F	Site-measured
Utility Meter Peak Demand	kW	Whole-building monthly peak
Building Operating Mode	Flag	Prep / Service / Closed

Code Reference

2025 CA Title 24, Part 6, Section 110.1– Mandatory Requirements for Appliances

110.1(a): *Any appliance regulated by the Appliance Efficiency Regulations, Title 20 California Code of Regulations, Section 1601 et seq., may be installed only if the appliance fully complies with Section 1608(a) of those regulations.*

110.1(b): *Except for those circumstances described in Section 110.1(c), comformance with efficiency levels required to comply with Part 6 mandatory, prescriptive and performance standards shall be verified utilizing data from either:*

1. *The Energy Commission's database of certified appliances maintained pursuant to Title 20 California Code of Regulations Section 1606, and which is available at: www.energy.ca.gov/appliances/database/; or*
2. *An equivalent directory published by a federal agency; or*
3. *An approved trade association directory as defined in Title 20 California Code of Regulations Section 1606(h).*

110.1(c): *Conformance with efficiency levels required to comply with Part 6 mandatory, prescriptive and performance standards shall be demonstrated either by default to the mandatory efficiency levels specified in Part 6 or by following procedures approved by the Commission pursuant to Section 10-109 of Title 24, Part 1, when:*

1. *Data to verify conformance with efficiency levels required to comply with Part 6 mandatory, prescriptive and performance standards is not available pursuant to subdivision (b); or*
2. *Field verification and diagnostic testing is required for compliance with Part 6 and the Energy Commission has not approved a field verification and diagnostic test protocol that is applicable to the appliance; or*
3. *The appliance meets the requirements of Section 110.1(a) but has been site-modified in a way that affects its performance; or*
4. *The U.S. Department of Energy has approved a waiver from federal test procedures, pursuant to 10 CFR Section 430.27 or Section 431.401 and that waiver fails to specify how the efficiency of the system shall be determined.*

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.

2025 CA Title 24, Part 6, Section 110.3– Mandatory Requirements for Service Water-Heating Systems and Equipment

(a) Certification by manufacturers. Any service water- heating system or equipment may be installed only if the manufacturer has certified that the system or equipment complies with all of the requirements of this subsection for that system or equipment.

1. *Temperature controls for service water-heating systems. Service water-heating systems shall be equipped with automatic temperature controls capable of adjustment from the lowest to the highest acceptable temperature settings for the intended use as listed in Table 3, Chapter 50 of the ASHRAE Handbook, HVAC Applications Volume or Table 613.1 of the California Plumbing Code for healthcare facilities.*

Exception to Section 110.3(a)1: Residential occupancies

Othe aspects of 110.3 includes:

- *Tank insulation requirements*
- *Recirculation loop requirements (controls, check valves, isolation valves, pump configuration)*

Commercial kitchens often have high recirculation and high first-hour demand; these requirements directly affect electric or heat pump water-heating system design.

2025 CA Title 24, Part 6, Section 140.5– Prescriptive Requirements for Service Water-Heating Systems

- Nonresidential service water-heating systems must comply with §§110.1, 110.3, and 120.3, or meet performance compliance under §140.1
- Gas systems ≥1 MMBtu/h must meet 90% thermal efficiency
- For an all-electric kitchen measure, this section defines the prescriptive baseline against which electrification is evaluated.

2025 CA Title 24, Part 6, Section 140.9– Prescriptive Requirements for Covered Processes

Commercial kitchen exhaust systems fall under covered process requirements. While not fully shown in the retrieved snippet, §140.9 governs:

- *Commercial kitchen hood exhaust airflow*
- *Demand ventilation systems*
- *Makeup air requirements*
- *Energy recovery devices for kitchen exhaust*

This section is directly applicable to all-electric commercial kitchens because ventilation rates and hood design affect:

- *Electrical demand*
- *HVAC load impacts*
- *Potential IAQ and exhaust optimization*

Eligible Climate Zones and Building Types

Eligible Climate Zones

This high-performance measure applies statewide in **California Climate Zones 1-16** (Title 24). Applicants must identify the project's climate zone in the submittal.

Eligible Building Types

This high-performance measure applies to:

- **Nonresidential**: Commercial, public, agricultural, and industrial facilities (e.g., offices, retail, lodging, education, healthcare, food service, civic buildings).

Eligible Project Scopes

This high-performance measure applies to:

- **New construction**, **additions**, and **major alterations/retrofits** to systems served by the measure.

This high-performance measure does not apply to (not in scope):

- **Low-rise residential** (single-family and multifamily ≤3 habitable stories above grade).
- **High-Rise Multifamily**: Buildings with four (4) or more habitable stories above grade.

Measure Exclusions

The following applications, equipment types, and project conditions are excluded from eligibility under the All-Electric Commercial Kitchen High-Performance Measure (HPM).

Out-of-Scope Applications

The following are not eligible:

- Residential kitchens (single-family, multifamily dwelling units, or hotel guest rooms).
- Mobile kitchens, food trucks, temporary installations, or demonstration-only facilities.
- Projects that electrify only select appliances while retaining any gas-fired cooking equipment within the same kitchen.
- Kitchens that retain a gas-fired service/domestic hot water system serving kitchen loads (*except where explicitly permitted under district or campus central system exception language*).
- Refrigeration equipment, ice machines, HVAC equipment, or ventilation-only upgrades not directly required as part of full kitchen electrification.
- Service water heating systems serving non-kitchen loads only.
- Pool heating or non-kitchen process heating systems.

Full electrification of all commercial cooking equipment and kitchen-serving service/domestic hot water systems is required unless otherwise permitted under the measure's stated exception.

Certification and Baseline Conditions That Do Not Qualify

The following cases are ineligible for inducement:

- Projects where electrification is required by state or local ordinance at time of permit.
- Like-for-like replacement of existing electric equipment.
- Replacement of gas equipment where the applicable baseline is already electric.
- Used or refurbished equipment installations.
- Equipment not listed for commercial use (e.g., UL, ETL).
- Electric resistance-only substitutions installed solely to meet minimum compliance where higher-performance electric alternatives are typical market practice.

Where electrification is mandatory under local code, inducements will not be provided for baseline-required equipment.

Anti-Double-Dip Provisions

To prevent overlapping inducements:

1. The same equipment or infrastructure upgrade may not claim inducements under more than one CEDA High-Performance Measure.
2. Projects may not claim overlapping inducements for the same systems under:
    - Central Heat Pump Water Heater Systems (LM402)
    - Building Management Systems HPM
    - Space Heating Hydronic Heat Pump HPM
    - Any other CEDA HPM with shared incremental cost elements
3. Electrical infrastructure upgrades (panels, feeders, switchgear) serving multiple electrification measures must be proportionally allocated and may not be fully attributed to more than one HPM.
4. Equipment receiving incentives from other utility programs must disclose those incentives. CEDA inducements will apply only to verified incremental costs not otherwise subsidized.

Documentation Requirements

Projects must provide:

- Complete commercial kitchen equipment schedules
- Electrical panel schedules reflecting added load
- Documentation confirming removal or non-installation of gas cooking equipment
- Signed certification of full kitchen electrification

Failure to provide required documentation or evidence of overlapping inducement claims may result in denial or rescission of inducement.

Reviewer Checklist

High-Performance Measure Reviewer Checklist

Checklist Description: This checklist captures the elements that must be present in the project design to be eligible for the high-performance measure inducement or consideration for additional site metering.

Project Name: _____ **Review Date:** _____

Assessment:

- ☐ Approved
- ☐ Not approved

Notes:

Reviewer: _____ **Signature:** _____

High-Performance Measure Requirements	Comments

System Eligibility

- ☐ Project includes full electrification of all commercial kitchen equipment
- ☐ All kitchen water-heating equipment serving the kitchen is electric (*except where explicitly permitted under district or campus central system exception language)*
- ☐ No natural gas piping or gas-fired appliances remain serving the kitchen scope

Documentation Requirements

- ☐ Inventory of kitchen equipment provided, including make, model, and electrical rating for each appliance
- ☐ Electrical panel schedules provided for panels serving the kitchen, including subtotal connected load and demand factors by category
- ☐ Kitchen floorplan provided showing layout and space allocation for electric kitchen equipment
- ☐ Ventilation hood and exhaust system documentation provided, including make, model, and airflow capacity (CFM)
- ☐ Equipment costs documented
- ☐ Installation costs documented, including breakdown of costs (as applicable)

Version History Log

Version	Effective Date	End Date	Change Description
1	February 23, 2023	March 1, 2026	N/A
1.2	March 2, 2026	*Pending New Version Release in June, 2026*	Updated measure to the current CEDA HPM format, IMC, and added reviewer checklist