# High-Performance Measure Details

**Measure Name**
Central Heat Pump Water Heater Systems

**Use Category**
WH - Service & Domestic Hot Water

**Effective Date**
February 2, 2026

**Version**
4

**Measure Code**
LM402

**Measure Stage**
Early Adoption & High Priority Data Collection

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# Technology Summary

Central heat pump water heater (CHPWH) systems are high-efficiency, all-electric service water-heating solutions that use one or more heat pumps to generate and distribute domestic and service hot water throughout a building. By leveraging vapor-compression heat pump technology and thermal energy storage, CHPWH systems deliver hot water with substantially lower energy use and greenhouse gas emissions than conventional central service water-heating systems that rely on direct combustion or electric resistance heating.

CHPWH systems are designed around system-level performance, integrating heat pump capacity, primary thermal storage, temperature maintenance, and advanced controls into a coordinated plant. Modern CHPWH installations commonly employ single-pass heat pump architectures, dedicated primary storage tanks, and temperature maintenance or recirculation tanks to meet peak demand while minimizing distribution losses and compressor cycling. When properly designed, commissioned, and operated, these systems can achieve system coefficients of performance (SysCOP) that significantly exceed prescriptive code minimums, providing reliable hot water service with improved operating efficiency.

In addition to energy efficiency benefits, CHPWH systems offer unique opportunities to support grid-interactive and load-flexible building operation. The inherent thermal storage associated with central hot water systems enables heat pump operation to be shifted to off-peak or low-carbon periods, allowing for demand response, peak load reduction, and improved alignment with renewable energy generation. Advanced CHPWH systems integrated with

building automation or energy management systems can pre-heat storage, modulate operation during peak events, and provide high-quality operational data to inform future energy codes and standards.

As California's building stock transitions toward electrification and higher-performance service water-heating solutions, CHPWH technology represents a foundational strategy for multifamily, commercial, and public buildings. This High-Performance Measure prioritizes CHPWH system designs that go beyond prescriptive code requirements by emphasizing verified system efficiency, rigorous design and commissioning practices, and readiness for grid-interactive operation, supporting both near-term market transformation and long-term code readiness objectives.

## Alignment with CEDA Program Goals

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

Projects must meet one of 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 CHPWHs, this helps to increase the overall supply of CHPWHs 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 enable technological innovation.
- **Providing Codes & Standards with projects of interest** to collect metered data that will inform future California energy codes.

# CEDA Inducement Requirements

The following inducement requirements are structured to support the deployment of high-performance central heat pump water heater (CHPWH) systems that exceed 2025 Title 24 prescriptive requirements, advance building electrification, and support California's long-term decarbonization and grid-interactivity goals.

With the adoption of the 2025 Title 24 Energy Code, CHPWH systems are now recognized as an acceptable compliance pathway for multifamily central domestic hot water applications. Accordingly, this High-Performance Measure (HPM) focuses inducements on advanced and premium CHPWH system designs that demonstrate verified performance uplift, rigorous system documentation, enhanced commissioning, and demand-response readiness beyond code minimums.

This HPM offers two dependent design levels: **Advanced Level (Beyond-Code CHPWH System Design)** and **Premium Level (High-Performance, Grid-Interactive CHPWH System).** Projects seeking to claim the Premium Level must first demonstrate full compliance with all Advanced Level requirements. Eligibility for inducements is determined by the highest tier for which all applicable System Design Requirements and Supporting Documentation Requirements are met. Refer to the tier-specific sections below for the requirements associated with each level.

## System Design Requirements

1. **Advanced Level**: Beyond-Code CHPWH System Design
   - 1.1. Central CHPWH System Requirement
     - 1.1.1. The project shall provide a central heat pump water heating system serving the domestic/service hot water loads of a qualifying multifamily, commercial, public, agricultural, or industrial building.
     - 1.1.2. The system shall comply with all applicable state and local codes and permitting requirements.
   - 1.2. AWHS-Aligned System Configuration
     - 1.2.1. The CHPWH system shall be designed in accordance with NEEA Advanced Water Heater Specification (AWHS) qualified system configurations, as applicable, including but not limited to:
       - 1.2.1.1. Single-pass HPWH with no hot water circulation
       - 1.2.1.2. Single-pass HPWH with circulation returned to primary storage
       - 1.2.1.3. HPWH systems with temperature maintenance (TM) tanks in series or parallel
       - 1.2.1.4. Integrated or split-system HPWH configurations
     - 1.2.2. System configuration shall be clearly identified and documented in construction drawings.
   - 1.3. Performance Uplift Requirement
     - 1.3.1. To demonstrate performance beyond the 2025 Title 24 prescriptive baseline, the project shall meet *at least one* of the following:
       - 1.3.1.1. Documented system design SysCOP ≥ 2.5, calculated using manufacturer performance data and design operating conditions; OR
       - 1.3.1.2. Design-ready system metering provisions sufficient to calculate system COP post-installation (thermal and electrical) ; OR
         - 1.3.1.2.1. (Design-ready provisions may include dedicated electrical circuits, identified meter locations, and clearly defined flow and temperature measurement points.)
       - 1.3.1.3. Enhanced low-ambient capability, with minimum heat pump compressor cut-off temperature ≤ 32°F; OR
       - 1.3.1.4. Primary thermal storage temperature setpoint ≥ 140°F, with temperature maintenance design minimizing recirculation losses.
   - 1.4. Commissioning & Verification
     - 1.4.1. CHPWH system start-up shall be performed by a manufacturer-authorized representative.
     - 1.4.2. System controls and operating sequences shall be verified as part of start-up.

2. **Premium Level:** High-Performance, Grid-Interactive CHPWH System
   2.1. Premium Eligibility Threshold
      2.1.1. Projects pursuing the Premium inducement shall meet all Advanced Level system design requirements, plus the additional enhancements specified herein.
   2.2. AWHS Tier 3+ System Performance
      2.2.1. The CHPWH system shall be listed on the NEEA AWHS Qualified Products List (QPL).
      2.2.2. The system shall achieve a minimum System COP (SysCOP) equal to or greater than AWHS Tier 3, as defined in the current AWHS specification.
   2.3. Advanced Controls & System Integration
      2.3.1. The CHPWH system shall be integrated with a Building Automation System (BAS), Energy Management System (EMS), or equivalent whole-building supervisory control platform.
      2.3.2. The control system shall support monitoring of heat pump power input, storage temperatures, and system operating status.
   2.4. Demand Response & Load Flexibility Readiness
      2.4.1. The CHPWH system shall be designed and equipped to support demand response and load-flexible operation, leveraging thermal energy storage.
      2.4.2. Controls shall be capable of:
         2.4.2.1. Time-of-use-based operation and off-peak charging
         2.4.2.2. Pre-heating thermal storage ahead of peak demand periods
         2.4.2.3. Temporary load shedding or modulation during peak or demand response events
      2.4.3. The system shall be capable of receiving external control signals via one or more of the following:
         2.4.3.1. BAS or EMS supervisory controls
         2.4.3.2. OpenADR-compatible interface or equivalent open protocol
         2.4.3.3. Utility- or aggregator-ready digital input (e.g., BACnet, Modbus, dry contact)
      2.4.4. Active enrollment in a demand response program is not required to receive an inducement under this measure tier. These capabilities are intended to enable future demand response or load management participation but do not require active enrollment at the time of project completion.
   2.5. Thermal Storage Strategy Documentation
      2.5.1. Design documentation shall describe the system's thermal storage control strategy, including:
         2.5.1.1. Normal operating temperature ranges
         2.5.1.2. Pre-heat or charge strategy during off-peak periods
         2.5.1.3. Allowable temperature setback or load shed strategy during peak periods

## Supporting Documentation Requirements

1. **Advanced Level Supporting Documentation**
   1.1. Engineered Construction Documents
      1.1.1. Engineered, stamped, and permitted construction drawings identifying:
         1.1.1.1. CHPWH system layout and equipment schedules
         1.1.1.2. Storage tank volumes and temperature setpoints
         1.1.1.3. Piping configuration and recirculation strategy
         1.1.1.4. Controls diagrams and sequences of operation
   1.2. CHPWH Equipment Submittals
      1.2.1. Manufacturer equipment submittals stamped and approved by the Engineer of Record.
      1.2.2. Submittals shall include performance data and installation requirements.
   1.3. AWHS Product Assessment Datasheet (PADS)
      1.3.1. Manufacturer PADS demonstrating alignment with AWHS requirements and qualified configurations.
   1.4. Performance Uplift Documentation

1.4.1. Calculations, narratives, or manufacturer documentation supporting compliance with at least one Advanced Level performance uplift criterion.

1.5. Start-Up & Commissioning Documentation

1.5.1. Manufacturer-authorized system start-up documentation.

**2. Premium Level Supporting Documentation**

2.1. AWHS Tier 3+ Verification

2.1.1. Documentation confirming system listing on the AWHS Qualified Products List.

2.1.2. Documentation confirming SysCOP ≥ AWHS Tier 3.

2.2. BAS / EMS Integration Documentation

2.2.1. Description of BAS/EMS architecture and monitored points.

2.2.2. Identification of trended data relevant to CHPWH performance and load flexibility.

2.3. Demand Response Readiness Documentation

2.3.1. Control narratives or manufacturer documentation demonstrating:

2.3.1.1. Time-of-use scheduling capability

2.3.1.2. Load shedding or modulation capability

2.3.1.3. External signal integration readiness

2.3.2. Description of possible thermal storage control strategy supporting load shifting.

2.4. Enhanced Commissioning Verification

2.4.1. Confirmation that installed equipment, controls, and sequences match the AWHS QPL-listed configuration.

2.4.2. Verification that demand-response-related control capabilities are enabled and functional.

# Incremental Measure Cost

The Incremental Measure Cost (IMC) represents the estimated incremental first cost associated with implementing a qualifying central heat pump water heater (CHPWH) system relative to a code-minimum, centralized gas service water-heating system designed in accordance with the 2025 California Energy Code (Title 24).

IMCs are normalized to reflect how CHPWH systems scale in new construction and major renovation contexts, where project costs are driven by system size and building typology rather than discrete equipment replacement. IMC values are maintained and periodically reviewed to support program inducement calibration and market transformation and are not intended for project-specific cost reconciliation.

## Base Case

The base case represents a 2025 Title 24–compliant centralized gas service water-heating system, including:

- Central gas water-heating equipment meeting applicable Title 20 efficiency requirements, or ≥90% thermal efficiency where required by the 2025 Title 24 Energy Code
- Conventional hot water storage and distribution
- Standard controls, flue infrastructure, and gas service
- Typical design, installation, and commissioning effort for a centralized gas system

The base case reflects standard practice for new construction and does not include optional electrification, advanced controls, or grid-interactive functionality.

## Measure Case

The measure case consists of a CHPWH system compliant with the CHPWH HPM v4 design requirements, including:

- Dedicated central heat pump water-heating equipment
- Central thermal storage sized to meet DHW/SWH demand
- Electrical infrastructure upgrades relative to the gas baseline
- Additional system controls, integration, and commissioning required to support high-efficiency operation
- Tier-specific enhancements for Advanced or Premium projects, as applicable

Incremental cost is driven primarily by equipment premiums, electrical service impacts, system integration, and commissioning complexity, rather than by distribution system changes alone.

## IMC Values and Normalization

IMCs for this measure are presented as single representative normalized values, selected to reflect typical project conditions and system scale.

Multifamily (MFm) – Normalized by Dwelling Unit ($/DU)

IMCs are normalized by the number of dwelling units (DU), consistent with how centralized DHW system costs scale in multifamily buildings. Size class definitions are based on the number of dwelling units, consistent with California building prototypes and NEEA market segmentation.

- **Advanced Level CHPWH**: Incremental costs reflect central HPWH equipment, storage, electrical upgrades, and commissioning beyond code-minimum gas systems.
- **Premium Level CHPWH**: Incremental costs reflect additional system performance requirements, advanced controls, grid-interactive readiness, and enhanced documentation.

Economies of scale are expected as building size increases, with smaller projects experiencing higher per-unit incremental costs due to reduced load diversity and fixed infrastructure requirements.

| MFm Size | Advanced | Premium | Notes |
|---|---|---|---|
| **Small** (<19 DU) | $4,000/DU | $5,000/DU | Small sites have limited scale benefit; costs align with reported California retrofits. |
| **Medium** (20–79 DU) | $3,000/DU | $4,000/DU | Typical podium multifamily (approximately 3–5 stories). |
| **Large** (>80 DU) | $1,500/DU | $2,000/DU | High-rise or dense podiums; strong economies of scale. |

Non-Residential / Commercial / Public – Normalized by Gross Floor Area ($/ft²)

For non-residential buildings, IMCs are normalized by gross floor area (GFA) to reflect system scaling across varied occupancies.

- **Advanced Level CHPWH**: Incremental costs include central HPWH equipment, thermal storage, and system integration relative to gas service water-heating systems.
- **Premium Level CHPWH**: Incremental costs reflect additional system performance requirements, BAS/EMS integration, and demand-response readiness.

Larger buildings are expected to realize lower incremental costs on a per-square-foot basis due to higher and more consistent DHW demand profiles.

| Size Class | Advanced | Premium | Notes |
|---|---|---|---|
| **Small** (<20k ft²) | $7/ft² | $8/ft² | Small office/retail/public; limited load diversity. |
| **Medium** (20–50k ft²) | $5/ft² | $6/ft² | Mid-size commercial/public buildings. |
| **Large** (>50k ft²) | $3/ft² | $4/ft² | Large campuses/buildings; CHPWH plant costs spread over bigger load. |

*IMC values are intended for program inducement calibration and market transformation purposes only and do not represent a detailed project cost estimate, contractor bid, or guarantee of project-specific incremental costs.*

## Sources

IMC values are informed by a combination of publicly available studies, market data, and program experience, including:

- U.S. Department of Energy Building America and EERE case studies on central HPWH systems
- Multifamily and commercial CHPWH evaluation reports
- NEEA Advanced Water Heater Specification (AWHS) market documentation
- Utility and program benchmarking of CHPWH project costs in California

# Code Readiness Objectives

This measure is intended to inform the development of future energy codes by evaluating the cost-effectiveness, energy performance, and system-level design configurations of central heat pump water heater (CHPWH) systems relative to conventional central service water-heating approaches. While recent Title 24 updates have introduced prescriptive pathways for CHPWH systems, the market continues to evolve, and consistent, high-performance system design and delivery have not yet been fully standardized.

Data and experience collected through this measure are intended to support future code cycles by enabling regulators to:

- Define acceptable and repeatable CHPWH system configurations suitable for prescriptive code adoption.
- Identify opportunities to enhance performance-based compliance tools and modeling capabilities for central service water-heating systems.
- Improve acceptance testing, commissioning, and verification procedures to ensure installed systems perform as intended.
- Clarify application boundaries, including building types or load conditions where CHPWH systems may require supplemental strategies to reliably meet demand.

To support these objectives, Code Readiness seeks to capture information related to:

- The cost-effective application of CHPWH systems across multifamily, commercial, public, agricultural, and industrial buildings.
- Operational performance and efficiency of specific system configurations, controls, and thermal storage strategies.
- Distribution system types and configurations used in CHPWH installations, and any additional requirements needed to ensure system-level efficiency.
- System efficiency criteria that could be incorporated into future codes beyond equipment-level ratings.
- Product availability, contractor readiness, and first-cost characteristics of CHPWH systems in the California market.
- Potential enhancements to equipment test procedures or system evaluation methods to better reflect real-world CHPWH performance in different building applications.

## 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 12 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

- Operational efficiencies of central HPWH in commercial applications.
- Efficiency and energy use of water heating and distribution systems including secondary temperature maintenance heating (depending on the configuration).
- Engineering configurations, temperature maintenance system details, and customization requirements.
- Product cost and availability of larger HPWH products in CA.
- Costs of installation versus equipment in commercial and MF applications.

## Sample Data Points

A sample set of data points that would ideally be collected is provided below for reference. This list will be re-developed for each project based on the infrastructure and need of the monitoring effort:

| Data Points to Meter | Unit | Additional Specifications |
|---|---|---|
| HP Power | kW | Maximum and minimum values |
| Thermal Load Provided | BTU | Average and Peak values |
| Operational Efficiency | COP | Efficiency measured at each instance |
| Operational Efficiency | TMCOP | Efficiency of temperature maintenance |
| Supply Water Flow | GPM | Average |
| Supply Water Supply Temp | °F | Average |
| Supply Water Return Temp | °F | Average |
| Supply Water Load | BTU | Average |
| Secondary Water Flow | GPM | Average |
| Secondary Water Supply Temp | °F | Average |
| Secondary Water Return Temp | °F | Average |
| Secondary Water Load | BTU | Average |
| Pump(s) Power | kW | Average |
| Outdoor Temperature (Dry-Bulb) | °F | Measured at heat pump or site |
| Outdoor Air Moisture Level (Wet-Bulb) | °F | Measured at heat pump or site |
| Indoor Temperature | °F | Average |
| Building Mode (Occupied Unoccupied) | - | Flag indicating status |

# Code Reference

**2025 California Energy Code (Title 24, Part 6)**

**Section 170.2(d)2** – Central Service Water-Heating Systems (Residential Multifamily)

> *Requirements for central service water-heating systems serving multiple dwelling units, including prescriptive and performance compliance pathways for heat pump water-heating systems, gas service water-heating systems, solar water-heating systems, and drain water heat recovery.*

**Section 170.1** – Performance Compliance

> *Alternative compliance pathway allowing service water-heating systems that demonstrate equal or lower energy use relative to prescriptive requirements.*

**Section 110.3** – Mandatory Requirements for Service Water-Heating Systems and Equipment

> *Mandatory efficiency, control, and installation requirements applicable to all service water-heating systems, regardless of compliance pathway.*

**Residential Reference Appendix RA4** – Service Water-Heating Systems

> *Installation, control, and verification requirements for central service water-heating systems, including recirculation systems, temperature controls, and solar water-heating systems.*

**Residential Reference Appendix RA3** – Field Verification and Diagnostic Testing

> *Field verification requirements for service water-heating system insulation, controls, and related components.*

# Eligible Climate Zones, Building Types, & Project Scopes

**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:

- **High-Rise Multifamily**: Buildings with **four (4) or more habitable stories above grade**.
- **Nonresidential**: Commercial, public, agricultural, and industrial facilities.

**Eligible Project Scopes**

This high-performance measure applies to the following project scopes where a central heat pump water heater (CHPWH) system is installed and serves the domestic or service hot water loads of the building:

- **New construction** projects in qualifying multifamily, commercial, public, agricultural, or industrial buildings that install a CHPWH system as the primary service water-heating system.
- **Additions or major alterations** where a new or expanded central service water-heating system is installed to serve additional floor area, dwelling units, or building uses, and the system meets the Advanced or Premium tier requirements of this measure.

# Measure Exclusions

**This high-performance measure excludes:**

- Unitary, point-of-use, or small-capacity heat pump water heaters, including systems with a total storage capacity of less than 119 gallons, which are not considered central service water-heating systems for the purposes of this measure.
- Distributed or fragmented service water-heating configurations, including projects that utilize multiple independent CHPWH plants or water-heating systems located in more than one central location to serve the domestic or service hot water needs of a single building, which are addressed under separate CEDA measures.
- Pool and spa heat pump water heaters, or systems designed primarily to serve swimming pools, spas, or other recreational water-heating applications, which are addressed under separate CEDA measures.
- Heat pump systems used solely for space heating, including air-to-water or hydronic heat pump systems that do not serve domestic or service hot water loads.
- Systems in which the CHPWH does not function as the primary service water-heating source, including configurations where the majority of annual domestic or service hot water demand is met by non–heat pump technologies.
- Projects that do not meet the minimum Advanced or Premium Tier design requirements, including those that only satisfy prescriptive Title 24 compliance pathways without demonstrating beyond-code performance, documentation, or control capabilities as defined in this measure.
- Systems in which the CHPWH does not function as the primary service water-heating source including integrated space-conditioning systems (e.g., 4-pipe AWHPs or heat recovery chillers) where DHW production is secondary or opportunistic.

# Reviewer Checklist

## HPM Review Checklist: LM402 – Central Heat Pump Water Heater Systems – V4

**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:** _____

| Inducement Requirements – Advanced Level | Comments |
|---|---|
| ☐ Central CHPWH system provided serving domestic/service hot water loads, per §1.1.1. | |
| ☐ System complies with applicable state and local codes and permitting, per §1.1.2. | |
| ☐ CHPWH system configuration aligns with an AWHS-qualified configuration, per §1.2.1. | |
| ☐ System configuration clearly identified in construction drawings, per §1.2.2. | |
| ☐ At least one Advanced-Level performance uplift criterion is met, per §1.3.1:<br>○ Design SysCOP ≥ 2.5 (§1.3.1.1), OR<br>○ Design-ready thermal and electrical metering (§1.3.1.2), OR<br>○ Compressor cut-off temperature ≤ 32°F (§1.3.1.3), OR<br>○ Primary storage temperature ≥ 140°F (§1.3.1.4) | |
| ☐ Manufacturer-authorized system start-up performed, per §1.4.1. | |
| ☐ System controls and operating sequences verified at start-up, per §1.4.2. | |

| Supporting Documentation Requirements – Advanced Level | Comments |
|---|---|
| ☐ Engineered, stamped, and permitted construction documents provided, per §1.1.1. | |
| ☐ Drawings identify system layout, storage volumes, piping configuration, and controls, per §1.1.1.1–§1.1.1.4. | |
| ☐ Stamped CHPWH equipment submittals provided, per §1.2.1–§1.2.2. | |
| ☐ AWHS Product Assessment Datasheet (PADS) submitted, per §1.3.1. | |
| ☐ Performance uplift documentation submitted, per §1.4.1. | |
| ☐ Manufacturer-authorized start-up documentation submitted, per §1.5.1. | |

| Inducement Requirements – Premium Level | Comments |
|---|---|
| ☐ All Advanced Level inducement requirements satisfied, per §2.1.1. | |
| ☐ CHPWH system listed on the AWHS Qualified Products List, per §2.2.1. | |
| ☐ System achieves AWHS Tier 3 or higher SysCOP, per §2.2.2. | |
| ☐ System integrated with BAS, EMS, or equivalent supervisory control platform, per §2.3.1. | |
| ☐ Controls support monitoring of HP power, storage temperatures, and system status, per §2.3.2. | |
| ☐ System designed for demand response and load-flexible operation, per §2.4.1. | |

## HPM Review Checklist: LM402 – Central Heat Pump Water Heater Systems – V4

- ☐ Controls support TOU operation, pre-heating, and load shedding, per §2.4.2.
- ☐ System capable of receiving external control signals, per §2.4.3.
- ☐ Thermal storage control strategy defined, per §2.5.1.

| Supporting Documentation Requirements – Premium Level | Comments |
|---|---|
| ☐ AWHS QPL listing documentation submitted, per §2.1.1. | |
| ☐ SysCOP Tier 3+ verification documentation submitted, per §2.1.2. | |
| ☐ BAS/EMS integration documentation provided, per §2.2.1–§2.2.2. | |
| ☐ Demand response readiness documentation provided, per §2.3.1. | |
| ☐ Thermal storage control strategy documentation submitted, per §2.3.2. | |
| ☐ Enhanced commissioning verification provided, per §2.4.1–§2.4.2. | |

# Version History Log

| Version | Effective Date | End Date | Change Description |
|---|---|---|---|
| 1 | June 14, 2023 | May 16, 2024 | N/A |
| 2 | May 17, 2024 | March 30, 2025 | Updated format, sample data points list |
| 3 | March 31, 2025 | February 1, 2026 | Updated format, requirements, checklist |
| 4 | February 2, 2026 | Active | Updated design, documentation, incremental measure cost, and review requirements; sunset of Essential tier reflecting 2025 Title 24 code updates. |

*The version identified as 'Active' is the current published version and remains in effect until superseded by a subsequent published version. CEDA may update, replace, or retire High-Performance Measures without prior notice. End dates are assigned to prior versions once superseded.*