High-Performance Measure Details

Measure Name
Heat Pump Deemed Measure Gap Pathway

Use Category
HP – Deemed Measure Gap

Effective Date
October 26, 2026

Version
1.0

Measure Code
LM401 (HVAC); LM402 (Water Heating)

Measure Stage
Early Adoption & High Priority Data Collection

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Technology Summary

The **Heat Pump Deemed Measure Gap Pathway** does not define a single technology. It covers high-efficiency, electrically driven heat pump equipment for space conditioning and water heating that meets the technical intent of an existing CA statewide eTRM deemed measure package but **falls outside that package's eligibility definitions**. Covered equipment types include ducted and ductless split heat pumps, unitary air-cooled heat pumps under 65 kBtu/h, **variable refrigerant flow (VRF)** systems, residential and commercial **heat pump water heaters (HPWHs)**, and **dual duct packaged terminal heat pumps (DDPTHPs)**.

Across all covered **HVAC and water heating** equipment types, typical CEDA applications include **high-rise multifamily dwelling units**, **multifamily common areas** such as lobbies, corridors, amenity spaces, leasing offices, and laundry rooms, and **small nonresidential zones** and support spaces. The HPM also covers unitary heat pumps in buildings where ventilation is provided by a separate **dedicated outdoor air system (DOAS)**. That design approach is common in high-performance buildings, but it conflicts with deemed economizer requirements, as described below.

DDPTHPs are self-contained heat pumps with **no outdoor unit**. They mount inside the conditioned space on an exterior wall and exchange air with the outdoors through two small wall penetrations. Industry literature and product marketing also refer to them as *double duct packaged terminal heat pumps*, *micro heat pumps*, and

packaged all-in-one heat pumps. This memo treats these names as the **same equipment category**. DDPTHPs are distinct from conventional window and through-the-wall room air conditioners and room heat pumps, which have a condenser section exposed to outdoor air and are not eligible under this HPM.

Heat pumps are central to California's building electrification and decarbonization goals and to the long-term Codes and Standards pathway toward all-electric new construction. Deemed measure packages in the California eTRM are a **primary incentive pathway** for this equipment. When a project installs equipment that exceeds code but falls outside a package's eligibility definitions, the project **loses that pathway**, even though the equipment delivers the efficiency and electrification outcomes the program is intended to support.

This HPM provides a **CEDA-administered pathway** for these cases while the underlying deemed packages are updated through the eTRM process, with each gap **retired from this HPM** once its package is revised. Project records will help PG&E assess the market significance of each gap and prioritize those updates.

Based on Willdan's program experience and review of the current eTRM measure packages, these gaps are **generally not related to equipment performance**. They result from how the deemed measures are defined, in five categories:

1. **Building-type restrictions.** The residential HVAC packages (SWHC049 and SWHC050) are limited to residential building types and do not include **multifamily common areas**. The small commercial unitary package (SWHC014) covers nonresidential building types, so common-area equipment falls between the two. The residential HPWH package (SWWH014) has no new construction pathway for **multifamily dwelling units** at any storage size. It also excludes multifamily common-area HPWHs in new construction when the building has **natural gas service**, even though domestic hot water may be provided by HPWHs.
2. **Capacity and size thresholds.** Residential ducted and small commercial unitary offerings begin at **18 kBtu/h (1.5 tons)**. The commercial HPWH package (SWWH031) excludes storage capacities **below 45 gallons**.
3. **Code-exception conflicts.** Unitary equipment over **33 kBtu/h** without an **air-side economizer** is ineligible, even where Title 24, Part 6 allows an economizer exception for the application.
4. **Ventilation configuration.** The same economizer requirement excludes units that have no economizer because ventilation is provided by a **DOAS**, even though the design meets code.
5. **Technology classification boundaries.** DDPTHPs fall outside existing packaged terminal and unitary measure classifications. Some products are certified to AHRI 210/240 as single-package heat pumps (SEER2/HSPF2), while others are certified under the federal room air conditioner product class (CEER), which has no seasonal heating metric. Test methods for this product class are still developing. Standard high-efficiency (non-cold-climate) VRF systems are only partly covered: the residential ductless package includes SEER2-rated mini-split and multi-split systems under 65 kBtu/h in residential building types. Standard high-efficiency VRF systems **at 65 kBtu/h and above**, VRF with **ducted indoor units**, and VRF serving **nonresidential or common-area spaces** have no deemed equivalent and fall outside the scope of CEDA's existing Cold Climate VRF HPM.

A recent CalNEXT field demonstration, *Double Duct Packaged Terminal Heat Pump Field Demonstration* (ET23SWE0038), studied DDPTHPs in a new construction affordable multifamily building in PG&E territory. It found **energy savings over a code-minimum packaged terminal heat pump** at most monitored sites and recommended further laboratory testing and modeling to support a future deemed workpaper.

Each specific gap is labeled as a sub-measure (for example, **DMG-HVAC-1** or **DMG-WH-1**) in *Table 1* of the *CEDA Inducement Requirements* section, so project teams and reviewers can cite the exact gap being claimed.

Alignment with CEDA Program Goals

The **California Energy Design Assistance (CEDA)** program is a Market Support program intended to support the long-term success of California's nonresidential and high-rise multifamily new construction market by advancing decarbonization, accelerating adoption of emerging and high-performance technologies, informing future codes and standards, and helping project teams achieve deeper energy and operational performance. **High-Performance Measures (HPMs)** support these objectives by creating opportunities for projects to implement, evaluate, and build market experience with technologies and design practices that extend beyond conventional practice.

Projects seeking a CEDA HPM inducement must meet the applicable requirements identified in the following section. Where aligned with Code Readiness priorities, selected projects may also provide market, design, cost, operational, or metered performance information that can help inform future California Codes and Standards activities.

This measure supports **CEDA's Market Support** objectives by:

- **Increasing market demand** by giving project teams and owners a program pathway for high-efficiency heat pump equipment in applications that current deemed measure packages do not cover. These include high-rise multifamily dwelling units and common areas, small-capacity zones, and buildings with decoupled ventilation. This helps keep heat pump equipment in consideration during design, rather than having equipment decisions shaped by deemed measure definitions instead of building needs.
- **Increasing market supply and delivery capability** by encouraging designers and contractors to specify above-code heat pump equipment consistently across an entire building, not only in the spaces that fit an existing deemed package. It also expands market experience with smaller-capacity heat pumps and heat pump water heaters, and with newer product categories such as dual duct packaged terminal heat pumps. Distributors and manufacturers gain clearer visibility into demand in these market segments.
- **Building market partnerships and knowledge** by connecting project teams with technical guidance on applications where deemed measure definitions and design practice diverge. Examples include economizer exceptions, decoupled ventilation, and heat pump water heater selection for multifamily buildings. The measure also collects feedback from designers, contractors, manufacturers, and verification staff on where current eligibility definitions limit adoption.
- **Advancing innovation and accessibility** by supporting product categories whose rating metrics and test methods are still developing, and equipment types well suited to space-constrained and affordable multifamily applications. This lowers barriers for projects that would otherwise have no incentive pathway for these technologies.
- **Supporting Code Readiness and future market transformation** by documenting, for each sub-measure, project counts, equipment types, manufacturers, locations, and verification observations. PG&E can use this record to assess the market significance of each gap and prioritize updates to the corresponding deemed measure packages. Each sub-measure is intended to retire once its deemed package is updated. Where applicable, selected projects can also provide cost, installation, commissioning, and measured performance information. This includes field data for newer technologies such as dual duct packaged terminal heat pumps, where additional testing has been recommended to support future deemed measure development.

CEDA Inducement Requirements

This HPM provides a **pathway** for **above-code heat pump equipment** in CEDA-eligible **nonresidential and high-rise multifamily new construction** projects that cannot currently be claimed through a CA statewide deemed measure package because of how the package is defined, as described in the *Technology Summary*.

Eligibility is determined by sub-measure. Each sub-measure addresses **one specific limitation in one deemed measure package**, or a technology with no deemed equivalent (*Table 1*). CEDA identifies the applicable sub-measure during project review, and the project demonstrates that the equipment:

1. Falls **within the specific limitation** the sub-measure addresses; and
2. Meets **all other requirements** of the referenced package, or the **CEDA-defined requirements** for sub-measures without a deemed equivalent.

The **HPM performance quantity** is the equipment's **certified rated efficiency**, which must be **at or above the minimum qualifying level** of the referenced package. That level exceeds federal, Title 20, and Title 24 minimums. Where Title 24 prescribes a heat pump technology, eligibility requires **exceeding the code-minimum efficiency for that technology**. ***Equipment or efficiency levels required by code alone do not qualify.***

The measure is **technology-neutral within each sub-measure**. Sub-measures without a deemed equivalent are defined by **functional characteristics**, not product or brand. Each sub-measure will be **retired once its deemed package is updated**, and project records will inform PG&E's deemed measure updates and Code Readiness learning.

Table 1. *Deemed Measure Gap (DMG) Sub-Measures*

Gap ID	Deemed Measure Package	Package Sector	Applies To	Gap	Category
DMG-HVAC-1	SWHC049 Ducted AC and HP HVAC Equipment, Residential	Residential	MF common area	Common areas are not an eligible building type	Building type
DMG-HVAC-2	SWHC049 Ducted AC and HP HVAC Equipment, Residential	Residential	MF dwelling unit, MF common area	Units below 18 kBtu/h (1.5 tons)	Size
DMG-HVAC-3	SWHC050 Ductless Heat Pump, Residential	Residential	MF common area	Common areas are not an eligible building type	Building type
DMG-HVAC-4	SWHC014 Unitary Air-Cooled AC or HP, Under 65 kBtu/hr, Commercial	Commercial	MF common area	Common areas are not an eligible building type	Building type
DMG-HVAC-5	SWHC014 Unitary Air-Cooled AC or HP, Under 65 kBtu/hr, Commercial	Commercial	Nonresidential, MF common area	Units 33–65 kBtu/h with no economizer under a Title 24 exception	Code exception
DMG-HVAC-6	SWHC014 Unitary Air-Cooled AC or HP, Under 65 kBtu/hr, Commercial	Commercial	Nonresidential, MF common area	Units 33–65 kBtu/h with no economizer because a separate DOAS provides ventilation	Ventilation
DMG-HVAC-7	SWHC014 Unitary Air-Cooled AC or HP, Under 65 kBtu/hr, Commercial	Commercial	Nonresidential	Units below 18 kBtu/h (1.5 tons)	Size
DMG-WH-1	SWWH014 Heat Pump Water Heater, Residential	Residential	MF dwelling unit	No new construction pathway at any storage size, including below 45 gallons	Building type

Gap ID	Deemed Measure Package	Package Sector	Applies To	Gap	Category
DMG-WH-2	SWWH031 Heat Pump Water Heater, Commercial	Commercial	Nonresidential	Storage below 45 gallons	Size
DMG-WH-3	SWWH014 Heat Pump Water Heater, Residential	Residential	MF common area	No new construction pathway in buildings with natural gas service (SWWH014 Program Exclusion 3)	Building type
DMG-NT-1	None	N/A	MF dwelling unit, MF common area, nonresidential	Dual duct packaged terminal heat pumps have no deemed classification	Technology
DMG-NT-2	None	N/A	Nonresidential, MF common area, MF dwelling unit	VRF at 65 kBtu/h and above, VRF with ducted indoor units, or VRF serving nonresidential or common areas, exceeding Title 24 minimums	Technology

*Notes: HVAC=heating, ventilation, and air conditioning; WH=water heating; NT=new technology; and MF=multifamily. Referenced deemed measure packages are the versions effective January 1, 2026. DMG-HVAC and DMG-NT sub-measures are tracked under **LM401** (HVAC); DMG-WH sub-measures are tracked under **LM402** (Water Heating).*

Measure Eligibility (ME) – All Projects

1. **Qualifying Scope**
   - 1.1. The project shall install heat pump space-conditioning or water-heating equipment that falls within **one or more sub-measures listed in Table 1**.
   - 1.2. Each claimed unit or system **shall be assigned to exactly one sub-measure**.
     - 1.2.1. Where equipment falls under more than one gap, it **shall be assigned in this order of priority**: size, then economizer or ventilation, then building type.
   - 1.3. CEDA will identify the **applicable sub-measure** and the **specific deemed measure package limitation** during project review, based on the project's construction documents and equipment submittals.
2. **Deemed Pathway Priority**
   - 2.1. Equipment eligible under a current deemed measure package available to the project is **not** eligible under this HPM and should be claimed through that package.
   - 2.2. For **DMG-HVAC** and **DMG-WH** sub-measures, equipment shall meet all requirements of the referenced deemed measure package's measure case **except** the specific limitation addressed by the sub-measure. This includes minimum efficiency, rating certification, equipment configuration, and refrigerant requirements.
   - 2.3. Where both a **residential and a commercial package** could apply, the sub-measure shall follow the deemed measure package whose equipment type and rating basis match the installed equipment.
   - 2.4. For **DMG-NT** sub-measures, equipment shall meet the **CEDA-defined requirements** in the System Design Level Requirements.
   - 2.5. DDPTHPs are not eligible under SWHC050, whose measure case is limited to ductless mini-split and multi-split systems. References to room units in SWHC050 describe base case equipment only. AHRI 210/240 certification of a DDPTHP does not establish a deemed pathway under SWHC050 or SWHC014.
3. **Rating and Certification**
   - 3.1. Efficiency shall be demonstrated by using certified ratings at standard rating conditions, as listed in the **AHRI Directory**, the **DOE Compliance Certification Database**, or the **CEC Modernized Appliance Efficiency Database System (MAEDbS)**, as applicable to the equipment class.

3.2. Where a federal or industry rating method has not been established for an equipment class, manufacturer-published ratings and the associated test basis shall be provided, as described in the Supporting Documentation Requirements.

4. **Performance Quantities**
   4.1. The HPM performance quantity is the **certified rated efficiency** applicable to the equipment class (SEER2 and HSPF2, IEER and COP, or UEF and COP, as applicable).
5. **Eligible Project Types and Climate Zones**
   5.1. As defined in *Eligible Climate Zones, Building Types, and Project Scopes*.
6. **Code Compliance**
   6.1. All projects shall comply with the **2025 Title 24, Part 6** requirements, **Title 20 Appliance Efficiency Regulations**, applicable federal efficiency standards, applicable federal and CARB refrigerant GWP regulations, and applicable local codes.
   6.2. HPM requirements are intended to be **above code** and do not replace code compliance obligations.
7. **Interaction with Other HPMs and Programs**
   7.1. The same equipment shall not be claimed under this HPM and under a deemed measure package or another CEDA HPM.
   7.2. Equipment meeting the requirements of a **dedicated CEDA HPM** shall be claimed under that HPM, including Cold Climate Air Source Heat Pump, Cold Climate Variable Refrigerant Flow, Central Heat Pump Water Heater Systems, and Semi-Central Heat Pump Water Heater Systems, as applicable.
   7.3. **DMG-WH-1** and **DMG-WH-3** apply to **individual heat pump water heaters**. Central and semi-central water-heating systems are not eligible under these sub-measures.
   7.4. Separate scope may be claimed under other HPMs where **no equipment is double counted**. For example, a DOAS serving a DMG-HVAC-6 project may be claimed under a qualifying DOAS HPM.
8. **Sub-Measure Availability**
   8.1. Each **sub-measure remains available** until the **referenced deemed measure package is updated** to address the gap.
   8.2. Sub-measure retirement will be documented in the **Version History Log**. Treatment of projects in progress at retirement follows **CEDA program policy**.

System Design Level Requirements (SDLR) – New Construction

Each sub-measure has a single set of design requirements. For sub-measures that reference a **deemed measure package**, the minimum efficiencies in this section are based on the package versions **effective January 1, 2026**, and **these values govern eligibility under this HPM**. When a referenced package is revised, CEDA will review the change and **update this HPM through a documented version revision**, recorded in the *Version History Log*. If a package revision **closes the gap** a sub-measure addresses, that sub-measure will be **retired** as described in ME item 8.

1. **DMG-HVAC-1 and DMG-HVAC-2 (SWHC049)**
   1.1. Ducted, SEER2-rated split or packaged heat pump certified to **AHRI 210/240**, with **SEER2 ≥ 15.2** and **HSPF2 ≥ 7.7**.
   1.2. **DMG-HVAC-1:** equipment serves a multifamily common area.
   1.3. **DMG-HVAC-2:** rated cooling capacity below 18 kBtu/h, serving a MF dwelling unit or common area.
2. **DMG-HVAC-3 (SWHC050)**
   2.1. Ductless mini-split or multi-split heat pump **below 65 kBtu/h**, certified to **AHRI 210/240** or **AHRI 1230**, with **SEER2 ≥ 15.2** and **HSPF2 ≥ 7.8**.
   2.2. Equipment serves a multifamily common area.
3. **DMG-HVAC-4 through DMG-HVAC-7 (SWHC014)**
   3.1. These requirements **apply to all four sub-measures**:
      3.1.1. Air-cooled unitary **packaged** or **split heat pump**, single-phase or three-phase, **below 65 kBtu/h**.
      3.1.2. **Variable-speed supply fan** with two or more speeds.

3.1.3. **Packaged heat pumps:** SEER2 ≥ 15.2 and HSPF2 ≥ 6.7.
3.1.4. **Split heat pumps:** SEER2 ≥ 16.2 and HSPF2 ≥ 7.5.
3.1.5. Packaged terminal units are not eligible under these sub-measures.

3.2. **DMG-HVAC-4:** equipment serves a multifamily common area. Units from 33 to 65 kBtu/h include an air-side economizer.
3.3. **DMG-HVAC-5:** units from **33 to 65 kBtu/h without an air-side economizer**, where the project applies an economizer exception under Title 24, Part 6 Section 140.4(e).
3.4. **DMG-HVAC-6:** units from **33 to 65 kBtu/h without an air-side economizer**, where ventilation for the spaces served is provided by a separate dedicated outdoor air system.
3.5. **DMG-HVAC-7:** rated cooling capacity below **18 kBtu/h**, serving **nonresidential space**.

4. DMG-WH-1 and DMG-WH-3 (SWWH014)

4.1. Individual UEF-rated heat pump water heater meeting the SWWH014 minimum for its voltage, at **any storage size**: **120V units UEF ≥ 2.75** (with or without electric resistance), and **240V units UEF ≥ 3.30**.
4.2. **DMG-WH-1:** serves an **individual multifamily dwelling unit** in new construction.
4.3. **DMG-WH-3:** serves a **multifamily common area** in a new construction building **with natural gas service**.

5. DMG-WH-2 (SWWH031)

5.1. Heat pump water heater with **storage below 45 gallons** and **UEF ≥ 3.30**.
5.2. Equipment serves **nonresidential** domestic hot water loads.

6. DMG-NT-1 (Dual Duct Packaged Terminal Heat Pumps)

These are proposed CEDA criteria for **DMG-NT-1**, based on the minimum requirements recommended in CalNEXT report *ET23SWE0038*.

6.1. Self-contained heat pump with all refrigeration components in a **single indoor package** and **no outdoor unit**, exchanging air with the outdoors through dedicated wall penetrations.
6.2. **Variable-speed, inverter-driven compressor** and variable-speed or multi-speed fans.
6.3. **Reverse-cycle defrost.** Units shall be configured **without internal electric resistance heating or electric resistance defrost**, so that space heating is provided by **compressor-based heat pump operation**.
6.4. Exterior wall penetrations **weatherproofed and sealed** in accordance with the manufacturer's instructions and the project's envelope design.
6.5. Equipment certified to **AHRI 210/240** shall meet **SEER2 ≥ 15.2 and HSPF2 ≥ 6.7**, consistent with the SWHC014 single-package heat pump minimum.
6.6. Equipment certified under the federal room air conditioner product class (10 CFR 430.32(b)) shall have a CEER at least 10% above the federal minimum for its product class and shall provide manufacturer-published heating capacity and COP at 47°F. *(Proposed CEDA criterion.)*
6.7. Equipment without an established rating pathway shall provide manufacturer-published cooling and heating performance ratings, their test basis, and the **code compliance pathway** used for the project.

7. DMG-NT-2 (VRF Outside SWHC050 Scope)

7.1. Air-source VRF multi-split heat pump system serving multiple indoor units through a shared refrigerant circuit, with a manufacturer-provided system controller.
7.2. **Systems below 65 kBtu/h:** certified to **AHRI 210/240**, with **SEER2 ≥ 15.2** and **HSPF2 ≥ 7.8**, which mirrors the SWHC050 minimum.
7.3. **Systems at 65 kBtu/h and above:** certified to **AHRI 1230**, with **IEER at least 10% above the federal minimum** and **COP at 47°F at or above the federal minimum**. These values are **proposed CEDA criteria**, shown in Table 2, below.

Table 2. *DMG-NT-2 Minimum Efficiency Requirements for Air-Source VRF Multi-Split Heat Pumps (≥65,000 Btu/h)*

Air-Source VRF System Cooling Capacity	VRF IEER without Heat Recovery	VRF IEER with Heat Recovery	VRF Minimum COP at 47°F Ambient
≥65,000 and <135,000 Btu/h	16.1	15.8	3.3
≥135,000 and <240,000 Btu/h	15.3	15.1	3.2
≥240,000 and <760,000 Btu/h	14.0	13.8	3.2

Supporting Documentation Requirements (SDR)

Documentation already included in the project drawings, schedules, submittals, control sequences, Title 24 compliance documents, or cost estimate **does not need to be duplicated**. This section identifies the **minimum information needed to verify** sub-measure eligibility, certified efficiency, and the specific deemed measure limitation being claimed. The information collected is consistent with the **data collection fields used by the referenced deemed measure packages**, so project records can support future deemed measure updates.

All Projects

1. **Construction Documents**
   - 1.1. Mechanical and plumbing **schedules and plans** identifying the claimed equipment, including **equipment tags**, **manufacturer**, **model number**, **rated capacity**, and the **spaces served**.
2. **Equipment Submittals and Certification**
   - 2.1. Approved **equipment submittals** for each claimed model.
   - 2.2. Where applicable, an **AHRI Directory certificate**, **DOE Compliance Certification Database** listing, or **CEC MAEDbS** listing matching the installed equipment or matched system combination.
3. **Title 24 Compliance Documentation**
   - 3.1. The project's **Title 24, Part 6 compliance documents** applicable to the claimed equipment.
4. **Installation Verification**
   - 4.1. **Nameplate photos** showing model and serial numbers, or equivalent confirmation during CEDA verification, demonstrating that installed equipment **matches the submitted models**.
5. **Cost Information**
   - 5.1. Equipment and installation **cost information as available**, consistent with standard CEDA practice.

Sub-Measure-Specific Documentation

Additional documentation is required **only** where the All Projects items do not already demonstrate the gap condition.

6. **DMG-HVAC-5 (Economizer Code Exception)**
   - 6.1. Title 24 mechanical compliance documentation identifying the **specific Section 140.4(e) economizer exception** applied to each claimed unit.
7. **DMG-HVAC-6 (Ventilation by DOAS)**
   - 7.1. Mechanical drawings or schedules showing that **ventilation for the spaces served is provided by a separate DOAS**.
   - 7.2. Submittals confirming the claimed units are **provided without an air-side economizer**.
8. **DMG-WH-1 and DMG-WH-3 (Residential HPWH Package)**
   - 8.1. Plumbing schedules showing an **individual heat pump water heater** serving each claimed dwelling unit or common area.
   - 8.2. **DMG-WH-3:** documentation that the building has **natural gas service**, such as utility service plans or gas piping drawings.

9. **DMG-NT-1 (Dual Duct Packaged Terminal Heat Pumps)**
   - 9.1. Manufacturer submittal or product data sheet confirming:
     - 9.1.1. a **single-package configuration with no outdoor unit**;
     - 9.1.2. an **inverter-driven compressor**;
     - 9.1.3. **reverse-cycle defrost**; and
     - 9.1.4. an ordered configuration **without internal electric resistance heat**, as identified by the manufacturer's model number nomenclature.
   - 9.2. Architectural or envelope **details for wall penetrations and exterior louvers or grilles**, showing weatherproofing and sealing.
   - 9.3. For equipment certified under the room air conditioner product class: DOE CCD or MAEDbS listing and manufacturer-published heating capacity and COP at 47°F. For equipment **without an established rating pathway**: manufacturer-published ratings, their test basis, and the **code compliance pathway** used for the project.
10. **DMG-NT-2 (VRF Outside SWHC050 Scope)**
    - 10.1. **AHRI 1230** certificate (65 kBtu/h and above) or **AHRI 210/240** certificate (below 65 kBtu/h) matching the **installed outdoor and indoor unit combination**, including whether the system has **heat recovery**.
    - 10.2. Drawings or schedules showing the condition that places the system outside SWHC050: **capacity of 65 kBtu/h or above**, **ducted indoor units**, or service to **nonresidential or common-area spaces**.

Incremental Measure Cost

The Incremental Measure Cost (IMC) values below are **program calibration inputs** used to support CEDA inducement development and cost-cap screening. They represent normalized estimates of the incremental first cost of installing equipment that meets this HPM's requirements, relative to code-minimum or standard-practice equipment of the same type and capacity.

These values are intended for program planning and inducement calibration only. They are **not** contractor bids, project estimates, or reconciliation values, and actual project costs will vary with equipment selection, site conditions, and market factors.

Because each sub-measure bridges a gap in a specific deemed measure package, IMC values are derived **primarily from the cost data in CPUC-approved deemed measure packages** effective January 1, 2026. That keeps the IMC basis consistent with the deemed pathway each sub-measure is intended to retire into. Values are used as published in those packages, without further escalation, and will be **revisited as CEDA obtains participating-project cost data**.

Base Case

The Base Case is **code-minimum or standard-practice equipment of the same type and capacity** as the measure case. Code-required features are included and not counted as incremental cost:

- **DMG-HVAC sub-measures:** heat pump equipment meeting federal and Title 20 minimum efficiency for its equipment class.
- **DMG-WH-1:** a standard-efficiency heat pump water heater, consistent with the Title 24 prescriptive baseline for multifamily dwelling units and the heat pump water heater baseline used in SWWH031.
- **DMG-WH-2 and DMG-WH-3:** an electric resistance storage water heater at federal minimum efficiency, consistent with the baselines in SWWH031 and SWWH014.
- **DMG-NT-1:** a code-minimum packaged terminal heat pump of equivalent capacity, consistent with the CalNEXT field demonstration baseline.
- **DMG-NT-2:** a VRF system at federal minimum IEER and COP, of equivalent capacity and indoor-unit scope.

Measure Case

The Measure Case is equipment meeting the System Design Level Requirements for the applicable sub-measure. Incremental cost is limited to the **higher-efficiency equipment premium**. Installation labor is assumed **equal** in both cases, consistent with the referenced deemed packages and the CalNEXT field demonstration. No additional commissioning scope is required by this HPM.

IMC Values and Normalization

IMC values are normalized to **$/ton of rated cooling capacity** for space-conditioning sub-measures and **$/unit** for water-heating sub-measures. These units match the claim units used by the referenced deemed packages, and they track the primary cost driver: equipment price scales with capacity for space conditioning and with the individual unit for water heaters.

IMC = *(Measure Material + Measure Labor) − (Base Material + Base Labor)*

Table 3. *Incremental Measure Cost by Sub-Measure*

Offering	Unit	Base Material	Base Labor	Measure Material	Measure Labor	Full Measure Cost	IMC[4]
DMG-HVAC-1, -2	ton	$1,296	$470	$1,496	$470	$1,966	**$201**
DMG-HVAC-3	ton	$1,087	Equal[1]	$1,514	Equal[1]	—	**$427**
DMG-HVAC-4 to -7, packaged	ton	$1,261	$1,201	$1,485	$1,201	$2,686	**$224**
DMG-HVAC-4 to -7, split	ton	$1,354	$1,201	$1,591	$1,201	$2,792	**$237**
DMG-WH-1	unit	$3,463	$1,251	$3,647	$1,251	$4,898	**$183**
DMG-WH-2	unit	$1,994	$703	$3,157	$703	$3,861	**$1,164**
DMG-WH-3	unit	$2,269	$703	$3,563	$703	$4,267	**$1,294**
DMG-NT-1	ton	$3,614	$1,807[2]	$3,976	$1,807[2]	$5,783	**$361**
DMG-NT-2, below 65 kBtu/h	ton	$1,087	Equal[1]	$1,514	Equal[1]	—	**$427**
DMG-NT-2, 65 kBtu/h and above	ton	—	Equal	+$78[3]	Equal	—	**$78**

[1] SWHC050 itemizes labor identically for base and measure cases; values are not published in the package document.
[2] Planning assumption: the midpoint of the installed-cost range reported in CalNEXT ET23SWE0038 ($3,500–$4,500, citing BPA 2022) minus CalNEXT equipment cost, applied equally to both cases.
[3] Incremental material only, derived from the SWHC046 cost-per-IEER relationship; proposed CEDA calibration assumption.
[4] Values rounded to the nearest dollar. IMC values are calculated from unrounded package costs and may differ by $1 from the difference of rounded table entries.

Calculation basis: For each sub-measure, the IMC is the difference between the published measure case and base case costs (material plus labor) for the **closest matching offering** in the referenced deemed measure package. It follows that package's cost methodology and markups; see the referenced eTRM measure for details. Where no direct match exists:

- **DMG-WH-1** uses the SWWH031 offering with a standard-efficiency heat pump water heater baseline (**2.91 UEF**).
- **DMG-WH-2** uses SWWH014 cost data, since SWWH031 has no cost bin below 45 gallons.
- **DMG-NT-1** uses CalNEXT ET23SWE0038 equipment costs: **$250/unit ÷ 0.692 ton = $361/ton**.

- **DMG-NT-2** below 65 kBtu/h applies the SWHC050 value. At 65 kBtu/h and above, it applies the SWHC046 cost slope of **$51.90/ton per 1.0 IEER** to the **1.5 IEER** step above the federal minimum (*proposed CEDA calibration assumption*).

These values represent typical incremental costs for new construction, including additions and alterations eligible for CEDA participation. They are intended for **program inducement calibration**, not project-specific cost reconciliation.

Sources

IMC values are informed by publicly available deemed measure cost data, field demonstration cost data, and program experience, and are intended to reflect typical market conditions rather than project-specific pricing, including:

- eTRM SWHC049-08, *Ducted AC and HP HVAC Equipment, Residential* (2026): https://www.caetrm.com/measure/SWHC049/08/
- eTRM SWHC050-08, *Ductless Heat Pump, Residential* (2026): https://www.caetrm.com/measure/SWHC050/08/
- eTRM SWHC014-09, *Unitary Air-Cooled AC or HP, Under 65 kBtu/hr, Commercial* (2026): https://www.caetrm.com/measure/SWHC014/09/
- eTRM SWHC046-06, *Packaged Heat Pump Air Conditioner, Commercial, Fuel Substitution* (2026): https://www.caetrm.com/measure/SWHC046/06/
- eTRM SWWH014-08, *Heat Pump Water Heater, Residential* (2026): https://www.caetrm.com/measure/SWWH014/08/
- eTRM SWWH031-06, *Heat Pump Water Heater, Commercial* (2026): https://www.caetrm.com/measure/SWWH031/06/
- CalNEXT, *Double Duct Packaged Terminal Heat Pump Field Demonstration*, ET23SWE0038 (2026) ET23SWE0038_Double Duct Packaged Terminal Heat Pump Field Demonstration_Final Report

Code Readiness Objectives

This measure supports CEDA's Code Readiness role by generating **project-level evidence on where current deemed measure definitions and code provisions diverge from new construction practice**. Each sub-measure represents a specific gap, and data from participating projects can inform PG&E's prioritization of **eTRM measure package updates**, as well as future Title 24 and test-procedure activity for technologies still building a field record, such as **dual duct packaged terminal heat pumps (DDPTHPs)**.

Routine CEDA verification under this HPM is limited to the documentation in the *Supporting Documentation Requirements*. Deeper field monitoring applies **only** to projects **separately selected** for Code Readiness activities.

The objectives include the following:

- **Quantify sub-measure uptake** by project count, unit count, capacity, building type, and climate zone, to identify which deemed measure gaps carry the greatest market significance.
- **Characterize DDPTHP field performance**, including part-load efficiency, low-ambient heating capacity, and defrost behavior, relative to published ratings, to support emerging rating and test-procedure development.
- **Evaluate unitary heat pumps operating without an air-side economizer** (DMG-HVAC-5 and DMG-HVAC-6), including the energy impact of DOAS-decoupled ventilation, to inform economizer eligibility requirements and Title 24 economizer exceptions.

- **Assess heat pump water heater operation in high-rise multifamily dwelling units**, including heat pump versus electric resistance operation and hot water delivery adequacy for smaller storage volumes.
- **Document small-capacity heat pump applications** (below 18 kBtu/h), including runtime, cycling, and sizing practice, to inform deemed measure capacity thresholds.
- **Collect installed cost, product availability, and contractor experience data** to recalibrate IMC values and support deemed measure cost updates.

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**. Monitored parameters are **not** HPM eligibility requirements.

Data Benefits

Collected data will help support:

- Prioritization of **eTRM deemed measure updates** for each sub-measure.
- **Rating and test-procedure development** for DDPTHPs and similar emerging product classes.
- Evaluation of **economizer requirements and exceptions** for DOAS-decoupled unitary systems.
- Field-based assumptions for **multifamily heat pump water heater** sizing and operation.
- **Recalibration of IMC values** using participating-project cost data.
- Future **modeling and deemed workpaper development** where field data is currently limited.

Sample Data Points

A sample set of data points is provided below for reference. This list will be re-developed for each project based on the sub-measure, the available infrastructure, and the needs of the monitoring effort.

Data Point	Unit	Additional Specifications
Minimum/Core Data Points		
Equipment electric power and energy	kW, kWh	Per unit or system; 1- to 15-minute intervals
Outdoor air dry-bulb temperature	°F	On-site sensor or nearby weather station
Supply and return (entering) air temperature	°F	At the indoor unit or air handler
Operating mode	Heat / Cool / Defrost / Off	From equipment controller or BAS
Hot water delivered (HPWH)	gal	Flow meter on hot water outlet or cold water inlet

Data Point	Unit	Additional Specifications
Inlet and outlet water temperature (HPWH)	°F	Paired with flow measurement
Calculated/Derived Metrics		
Delivered heating and cooling energy	Btu	Airflow × ΔT, or water flow × ΔT for HPWHs
Operational efficiency	COP / EER	Per interval and seasonal averages
Part-load ratio	%	Delivered load versus rated capacity
Heat pump share of HPWH energy	%	Heat pump versus electric resistance operation
Optional/Technology-Specific Data Points		
HPWH electric resistance element power	kW	Separate current transducer on the element circuit
Defrost events and duration (DDPTHP, VRF)	count, min	From the controller or inferred from mode and power data
Space temperature and humidity	°F, °F dew point	Report dew point or humidity ratio; pair RH with dry-bulb temperature
Supply fan airflow and power (DDPTHP)	CFM, W	Spot measurements across fan speeds
DOAS supply airflow and temperature (DMG-HVAC-6)	CFM, °F	From the BAS or a spot measurement

Code Reference

Applicable Codes and Standards

The table below identifies current federal and California regulatory requirements that may affect the Base Case or Measure Case for this HPM. Applicability varies by **equipment type, sub-measure, and project scope**. For detailed applicability, see the *Code Requirements* section of the referenced eTRM measure package for each sub-measure.

CODE	APPLICABLE CODE REFERENCE	EFFECTIVE DATE	CODE REVIEW DATE
CA Building Energy Efficiency Standards – Title 24, Part 6	§110.2, mandatory space-conditioning equipment efficiency, including **Table 110.2-G** (VRF)	January 1, 2026	October 2026
CA Building Energy Efficiency Standards – Title 24, Part 6	**§140.4(e)**, air-side economizers, including exceptions (DMG-HVAC-5, -6)	January 1, 2026	October 2026
CA Building Energy Efficiency Standards – Title 24, Part 6	§141.0(b)2Cii, **Table 141.0-E-1**, space-conditioning system requirements for alterations	January 1, 2026	October 2026
CA Building Energy Efficiency Standards – Title 24, Part 6	§110.1, §110.3, §120.3, §140.5, nonresidential service water heating	January 1, 2026	October 2026
CA Building Energy Efficiency Standards – Title 24, Part 6	**§170.2(d)**, multifamily water heating (DMG-WH-1, -3)	January 1, 2026	October 2026
CA Appliance Efficiency Regulations – Title 20	§1605.1(f)(1), water heaters	January 1, 2021	October 2026
Federal Standards – 10 CFR Part 430	**§430.32(c)**, consumer central air conditioners and heat pumps under 65 kBtu/h, including DDPTHPs certified as single-package heat pumps	January 1, 2023	October 2026

CODE	APPLICABLE CODE REFERENCE	EFFECTIVE DATE	CODE REVIEW DATE
Federal Standards – 10 CFR Part 430	§430.23(m) and **Subpart B, Appendix M1**, SEER2/HSPF2 test procedure	July 7, 2025	October 2026
Federal Standards – 10 CFR Part 431	**§431.97(i), Table 19**, commercial three-phase air conditioners and heat pumps under 65 kBtu/h, including VRF multi-split systems	January 1, 2025	October 2026
Federal Standards – 10 CFR Part 431	**§431.97(g)(2), Table 16**, VRF multi-split air conditioners and heat pumps at 65 kBtu/h and above (IEER, COP)	January 1, 2024	October 2026
Federal Standards – 10 CFR Part 430	**10 CFR 430.32(b)**, consumer room air conditioners (including room heat pumps), and 10 CFR 429.15 for certification	May 26, 2026	October 2026
Federal Standards – 10 CFR Part 430	**§430.32(d)**, consumer water heaters (UEF)	December 29, 2016	October 2026
Federal Standards – 10 CFR Part 430	Subpart B, Appendix E, uniform energy factor test procedure	December 18, 2023	October 2026
Federal Refrigerant Regulations – 40 CFR Part 84	**§84.54(c)(1)**, GWP limit of 700 for residential and light commercial AC and HP systems, excluding VRF. Systems with all components manufactured or imported before January 1, 2025 may continue to be installed (91 FR 31284)	January 1, 2025 (amended July 27, 2026)	October 2026
Federal Refrigerant Regulations – 40 CFR Part 84	**§84.54(c)**, GWP limit of 700 for VRF systems. Systems using components manufactured or imported before January 1, 2026 may be installed until January 1, 2027, or until January 1, 2028 for projects with a building permit approved before October 5, 2023 (89 FR 100381)	January 1, 2026	October 2026
CARB Refrigerant Regulations – 17 CCR	**§95374, Table 3**, GWP limit of 750 for new air-conditioning equipment, including VRF systems (January 1, 2026)	January 1, 2025	October 2026

Eligible Climate Zones, Building Types, and Project Scopes

Eligible Climate Zones

This high-performance measure applies statewide in **California Climate Zones 1–16** (Title 24), subject to any climate-zone limitations in the **referenced deemed measure package** for each sub-measure. Climate zone is confirmed from the project's Title 24 compliance documentation.

Eligible Building Types

This high-performance measure applies to:

- **High-Rise Multifamily:** buildings with **four (4) or more habitable stories above grade**, including **dwelling units** and **common areas**.
- **Nonresidential: commercial, public, agricultural, and industrial** facilities (e.g., offices, retail, lodging, education, healthcare, food service, warehouses, manufacturing, civic buildings).

Eligibility is based on the **qualifying sub-measure and application** shown in *Table 1*, not on building type alone.

Eligible Project Scopes

This high-performance measure applies to:

- **New construction**, including **additions and alterations eligible for CEDA participation**, which are covered under the same requirements as new construction.

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

- **Low-rise residential** (single-family and multifamily with three or fewer habitable stories above grade).
- **Equipment replacement** projects that do not meet CEDA participation eligibility.

Measure Exclusions

The following are **not** eligible under this HPM:

1. **Equipment eligible under a current deemed measure package** available to the project. This equipment should be claimed through that package.
2. **Equipment subject to the referenced package's own exclusions.** All exclusions in the referenced eTRM measure package apply to each sub-measure, **except** the specific limitation the sub-measure addresses. See the *Program Exclusions* section of the referenced eTRM measure.
3. **Non-heat-pump equipment**, including air conditioners without heat pump operation, fuel-fired equipment, and electric resistance space or water heating equipment.
4. **Code-minimum or code-required equipment**, or equipment that does not meet the **System Design Level Requirements** for the applicable sub-measure.
5. **Conventional packaged terminal units (PTACs and PTHPs)** and conventional window or through-the-wall room air conditioners and room heat pumps with a condenser section exposed to outdoor air, and DDPTHP-type units configured with **internal electric resistance heat** (DMG-NT-1).
6. **Equipment or systems addressed by a dedicated CEDA HPM**, including **Cold Climate Air Source Heat Pump**, **Cold Climate Variable Refrigerant Flow**, **Central Heat Pump Water Heater Systems**, and **Semi-Central Heat Pump Water Heater Systems**. These should be claimed under the applicable HPM.
7. **Equipment claimed under a sub-measure after its retirement**, once the referenced deemed measure package has been updated to address the gap.
8. **Minor maintenance, like-for-like equipment replacement**, and projects outside CEDA participation eligibility.
9. **Equipment that cannot be documented** with certified ratings or the information required in the *Supporting Documentation Requirements*.
10. **Double counting.** *The same recovered energy, incremental cost, or performance benefit shall not be claimed under more than one CEDA HPM.*

Exclusion from this HPM does **not** necessarily mean exclusion from other CEDA offerings.

CEDA program administrators reserve the right to determine whether claimed measures constitute overlapping scope for the same equipment, controls integration, or monitoring infrastructure.

Reviewer Checklist

HPM Reviewer Checklist: LM401 / LM402 – Heat Pump Deemed Measure Gap Pathway – V1.0

Checklist Description: This checklist captures the minimum design and post-installation elements used to confirm HPM inducement eligibility and identify projects for optional Code Readiness monitoring.

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

Assessment:

☐ Approved
☐ Not approved

Notes:

Reviewer: _____ **Signature:** _____

Reviewer Checklist – High-Performance Measure Requirements

Use this checklist to confirm that the submitted project scope, design documents, and supporting documentation demonstrate compliance with the claimed HPM pathway. Review only the items applicable to the claimed project scope.

Project Eligibility

☐ Nonresidential or high-rise multifamily (**4+ habitable stories**) new construction, including CEDA-eligible additions and alterations (§ME 5; *Eligible Project Scopes*)

☐ Climate zone confirmed from Title 24 documents, with no climate-zone limitation in the referenced package (*Eligible Climate Zones*)

☐ Equipment is **not** eligible under a current deemed measure package (§ME 2.1; Excl. 1)

Qualifying System Scope

☐ Heat pump space-conditioning or water-heating equipment (§ME 1.1; Excl. 3)

☐ Not addressed by a dedicated CEDA HPM (§ME 7.2; Excl. 6)

☐ DMG-WH-1 and DMG-WH-3: **individual** HPWH, not a central or semi-central system (§ME 7.3)

☐ Sub-measure has **not** been retired (§ME 8; Excl. 7)

Sub-Measure Selection *(select one per unit; §ME 1.2)*

Check each sub-measure claimed on the project. Each claimed unit is assigned to **only one** sub-measure. Where a sub-measure group has a parent line, confirm the parent line's shared requirements first, then check the **one** child line that applies to each unit. If a unit fits more than one gap, assign it by priority: **size**, then **economizer or ventilation**, then **building type** (§ME 1.2.1).

☐ **DMG-HVAC-1 / -2 (shared):** ducted heat pump certified to AHRI 210/240, **SEER2 ≥ 15.2, HSPF2 ≥ 7.7** (§SDLR 1.1)

- ☐ **HVAC-1:** serves an MF common area (§SDLR 1.2)
- ☐ **HVAC-2: below 18 kBtu/h**, serving an MF dwelling unit or common area (§SDLR 1.3)

☐ **DMG-HVAC-3:** ductless heat pump below 65 kBtu/h, **SEER2 ≥ 15.2, HSPF2 ≥ 7.8**, serving an MF common area (§SDLR 2)

HPM Reviewer Checklist: LM401 / LM402 – Heat Pump Deemed Measure Gap Pathway – V1.0

☐ **DMG-HVAC-4 to -7 (shared):** unitary heat pump below 65 kBtu/h with a **variable-speed supply fan** (two or more speeds). Packaged: **SEER2 ≥ 15.2, HSPF2 ≥ 6.7**. Split: **SEER2 ≥ 16.2, HSPF2 ≥ 7.5** (§SDLR 3.1)

- ☐ **HVAC-4:** MF common area, with an economizer on units from 33 to 65 kBtu/h (§SDLR 3.2)
- ☐ **HVAC-5:** 33–65 kBtu/h, no economizer, **§140.4(e) exception** applied (§SDLR 3.3)
- ☐ **HVAC-6:** 33–65 kBtu/h, no economizer, ventilation by a **separate DOAS** (§SDLR 3.4)
- ☐ **HVAC-7:** below 18 kBtu/h, nonresidential (§SDLR 3.5)

☐ **DMG-WH-1 / -3 (shared):** individual HPWH, **120V UEF ≥ 2.75** or **240V UEF ≥ 3.30**, any storage size (§SDLR 4.1)

- ☐ **WH-1:** serves an MF dwelling unit (§SDLR 4.2)
- ☐ **WH-3:** serves an MF common area in a building with **natural gas service** (§SDLR 4.3)

☐ **DMG-WH-2:** storage **below 45 gallons**, **UEF ≥ 3.30**, nonresidential (§SDLR 5)

☐ **DMG-NT-1:** single indoor package with no outdoor unit, inverter compressor, reverse-cycle defrost, **no internal electric resistance heat**, and sealed penetrations. Not a conventional PTHP or room unit (Excl. 5). If certified to AHRI 210/240: **SEER2 ≥ 15.2, HSPF2 ≥ 6.7**. If certified as a room AC/HP: CEER per §SDLR 6.6, with heating data (§SDLR 6)

☐ **DMG-NT-2:** below 65 kBtu/h: AHRI 210/240, **SEER2 ≥ 15.2, HSPF2 ≥ 7.8**. At 65 kBtu/h and above: AHRI 1230, meeting **Table 2** (§SDLR 7)

*Example: a 40 kBtu/h packaged heat pump serving an MF common area, with no economizer because a DOAS provides ventilation, fits both HVAC-4 (building type) and HVAC-6 (ventilation). By priority, it is claimed under **HVAC-6** only.*

Installation Verification

☐ Installed models match the submittals, by nameplate photos or CEDA verification (§SDR 4)

☐ DMG-NT-1: ordered configuration **without electric resistance heat** confirmed (§SDR 9.1)

Code and Scope Coordination

☐ Complies with Title 24, Title 20, federal efficiency standards, and refrigerant GWP regulations (§ME 6.1)

☐ Same equipment **not** claimed under a deemed measure package or another CEDA HPM (§ME 7.1; Excl. 10)

☐ Normalization quantity recorded: **rated cooling tons** for DMG-HVAC and DMG-NT, **installed units** for DMG-WH (*IMC*)

Supporting Documentation

☐ Schedules and plans showing tags, manufacturer, model, capacity, and spaces served (§SDR 1)

☐ Approved submittals and an AHRI, DOE CCD, or MAEDbS listing (§SDR 2)

☐ Title 24 compliance documents (§SDR 3)

☐ Sub-measure-specific documentation, where applicable (§SDR 6–10)

☐ Cost information, as available (§SDR 5)

Note: Deeper trend logging or metering is required only if the project is separately selected for Code Readiness monitoring.

Version History Log

Version	Effective Date	End Date	Change Description
1.0	October 26, 2026	Active	Initial release establishing measure scope, **12 deemed measure gap sub-measures**, eligibility, design requirements, supporting documentation, IMC, Code Readiness objectives, and reviewer checklist.

***Note**: 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.*