Self-Generation Incentive Program (SGIP) Heat Pump Water Heater (HPWH) Staff Proposal
Appendix A – Summary of Recommendations

Budget Allocations

Staff's budget recommendation for the $44,670,000 SGIP HPWH budget is shown in the tables below:

SGIP HPWH Budget Allocation by Activity

Activity	Amount
Program Administration:	$2,233,500
HPWH Incentives:	$42,436,500
Total SGIP HPWH Budget:	**$44,670,000**

SGIP HPWH Incentive Budget Allocation by Customer Class

Customer Class[1]	Percent	Amount
General Market Residential Unitary HPWHs	45%	$19,096,425
Equity Residential Unitary HPWHs	45%	$19,096,425
General Market Residential Central HPWHs	2.5%	$1,060,912
Equity Residential Central HPWHs	2.5%	$1,060,912
Commercial Unitary HPWHs	5%	$2,121,825
Total SGIP HPWH Incentive Budget	**100%**	**$42,436,500**

Residential Unitary HPWHs

Staff propose that residential unitary HPWHs be defined as both "integrated" and "split" HPWHs with a total nominal compressor output power of six kilowatt (kW) or less installed to serve a single household in a single-family, duplex, or multi-family property. Staff recommend that the Commission require all residential unitary HPWHs to meet the following requirements:

Appliance Requirements

- Residential unitary HPWHs must be identified as a California Energy Commission (CEC) Joint Appendix 13 (JA-13) compliant water heater by the CEC.
- Residential unitary HPWHs must be identified by (Northwest Energy Efficiency Alliance) NEEA's most recent qualified product list as having a CTA-2045 Compliant Communication Port.

[1] Residential includes multi-family residential properties on commercial rates.

Installation Requirements

- Residential unitary HPWHs should be installed in compliance with the CEC's JA-13 installation specifications.
- Integrated residential unitary HPWHs should be installed at a 135°F tank setpoint and a 120°F thermostatic mixing valve setpoint temperature.
- Split system residential unitary HPWHs should be installed at a 150°F and a 120°F TMV setpoint and a 120°F thermostatic mixing valve setpoint temperature.

Load Shifting Requirements

- Residential unitary HPWHs should be programmed to execute the basic load-up and light shed demand management functionality as defined in JA-13. This demand management functionality will signal the HPWH to store thermal energy during certain times to avoid electricity usage at different times
- Residential unitary HPWHs should execute the basic load-up and light shed demand management response based on the local utility's available SGIP-complaint time-of-use (TOU) rates.
- SGIP funded residential unitary HPWHs are permitted to enroll in demand response programs like other energy storage resources.

Staff propose the following incentive structure and values:

Incentive Structure & Value

- Base the residential unitary HPWH on the energy storage capacity of a 50-gallon tank volume and a temperature setpoint of 135°F.
- Calculate the residential unitary HPWH incentive using an estimated 3.1 kWh energy storage capacity regardless of tank size to simplify program administration.
- Set the initial SGIP HPWH incentive value for general market residential customers at $1,000/kWh.
- Set the initial SGIP HPWH incentive value for equity residential customers at $1,350/kWh.
- Provide a $1,500 low global warming potential (GWP) kicker incentive for HPWHs that utilize a refrigerant with a GWP less than 150.

Electrical Panel Upgrade and Electrical Service Incentives

- Provide a $2,800 electrical panel upgrade incentive for general market residential customers.
- Provide a $3,600 electrical panel upgrade incentive for equity residential customers.
- Establish an electrical panel incentive cap at 30 percent of both general market and equity residential budgets ($5,728,927 each).
- Electrical investor-owned utilities (IOUs) categorize any electrical service line upgrade costs required to complete a SGIP funded HPWH installation as "common facility costs."

Summarized in the table below are the maximum Residential Unitary HPWH Incentive values by customer class:

Maximum Unitary HPWH Incentives for a HPWH by Customer Class

Customer Class	Unitary HPWH Incentive	Low-GWP Kicker Incentive	Electrical Panel Upgrade Incentive	Max. SGIP HPWH Incentive
General Market Residential	$3,100	$1,500	$2,800	$7,400
Equity Residential	$4,185	$1,500	$3,600	$9,285

Incentive Layering

When incentive layering occurs, Staff propose:

- Reducing general market residential incentives by 100 percent of the value of other incentives for both ratepayer and non-ratepayer funded programs.
- Reducing equity residential customer incentives only when the total available incentive exceeds the total eligible project costs. When this occurs, the incentive should be reduced by 100 percent for both ratepayer and non-ratepayer funded programs until the sum of the SGIP and other incentives equal the total eligible project costs.
- The existing SGIP rules on incentives not exceeding total eligible project costs remain applicable.
- The existing SGIP rules requiring customers to disclose other incentives remain applicable.

Residential Central HPWHs

Staff propose that the Commission define residential central HPWHs as larger HPWH system designs that may include integrated and split design systems that meet two or more households' hot water demands. Staff does not propose establishing a strict total nominal compressor output threshold to allow for the submission of a variety of residential central HPWH system designs.

Staff recommend that the Commission require all residential central HPWHs to meet the following requirements:

Appliance Requirements:

- Individually installed or ganged together, HPWHs serving two more households must be identified as JA-13 compliant water heaters by the CEC or meet the US Environmental Protection Agency's Energy Star Commercial Water Heater Specifications Version 2.0 requirements.
- Larger central HPWH system designs must be approved and included in the CEC's California Building Energy Code Compliance software.

Installation and Load Shifting Requirements:

- Residential central HPWHs must be installed and operated in a manner that shifts energy from peak to off-peak periods and annually reduces greenhouse gas (GHG) emissions by five kilogram (kg) of carbon dioxide (CO_2) per kilowatt-hour (kWh).
- SGIP funded residential central HPWHs are permitted to enroll in demand response programs like other energy storage resources.

Staff propose the following incentive structure and values:

Incentive Structure & Value

- A single incentive based on the system's thermal energy storage capacity determined through the application process.
- Residential central unitary HPWH applicants are responsible for proposing the energy storage capacity of an individual system.
- The SGIP HPWH Program Administrator (SGIP HPWH PA) is responsible for reviewing, approving, or proposing modifications to the thermal energy storage capacity calculations.
- Residential central HPWH systems are subject to performance-based incentive payments.
- The SGIP HPWH PA reduces performance-based incentive payments for residential central HPWH projects by one dollar per kilogram of GHG emissions under the five kilogram of CO_2 per kilowatt-hour SGIP GHG reduction threshold, in alignment with rules established D.19-08-001.
- The SGIP HPWH propose via a tier two advice letter a methodology for establishing a project's non-load shifting baseline, a standard set of normalization factors (i.e., outdoor temperature, etc.), and a methodology for calculating GHG emission reductions.
- Set the initial residential central HPWH Incentive Value at $900/kWh for general market residential and $1,000/kWh for equity residential customers.
- Provide a $200/kWh kicker incentive for HPWHs using low-global GWP refrigerants.
- Establish a $300,000 per project incentive cap for residential central HPWHs.

Electrical Panel Upgrade and Electrical Service Incentives

- Common area or "whole building" electrical panel upgrades for multi-family buildings are ineligible for the Electrical Panel Upgrade incentive.
- Electrical IOUs categorize any electrical service line upgrade costs required to complete a SGIP funded central residential HPWH installation as "common facility costs."

Incentive Layering

When incentive layering occurs, Staff propose:

- Reducing general market residential incentives by 100 percent of the value of other incentives for both ratepayer and non-ratepayer funded programs.
- Reducing equity residential customer incentives only when the total available incentive exceeds the total eligible project costs. When this occurs, the incentive should be reduced by 100 percent for both ratepayer and non-ratepayer funded programs until the sum of the SGIP and other incentives equal the total eligible project costs.
- The existing SGIP rules on incentives not exceeding total eligible project costs remain applicable.
- The existing SGIP rules requiring customers to disclose other incentives remain applicable.

Commercial Unitary HPWHs

Staff propose that commercial unitary HPWHs be defined as individually- or ganged together- integrated and split HPWHs serving a single business's hot water demand with a total nominal compressor output power of six kW or more.

Staff recommend that the Commission require all commercial unitary HPWHs to meet the following requirements:

Appliance Requirements

- Individually installed commercial unitary HPWHs must meet the US EPA's Energy Star Commercial Water Heater Specifications Version 2.0 requirements.
- Commercial unitary HPWHs ganged together must be identified as JA-13 compliant water heaters by the CEC or meet the US EPA's Energy Star Commercial Water Heater Specifications Version 2.0 requirements.

Installation and Load Shifting Requirements

- Commercial unitary HPWHs applications must be installed and operated in a manner that shifts energy from peak to off-peak periods and annually reduces GHG emissions by five kg of CO_2 per kWh, like all other non-residential SGIP energy storage technologies.
- SGIP funded commercial unitary HPWHs are permitted to enroll in demand response programs like other energy storage resources.

Staff propose the following:

Incentive Structure & Value

- A single incentive based on the system's thermal energy storage capacity determined through the application process.
- Commercial unitary applicants are responsible for proposing the energy storage capacity of an individual system.
- The SGIP HPWH PA be responsible for reviewing, approving, or proposing modifications back to the applicant.
- The unitary commercial HPWH systems are subject to performance-based incentive payments.
- The SGIP HPWH PA reduces performance-based incentive payments for residential central HPWH projects by one dollar per kilogram of GHG emissions under the five kilogram of CO2 per kilowatt-hour SGIP GHG reduction threshold, in alignment with rules established D.19-08-001.
- The SGIP HPWH PA propose via a tier two advice letter a methodology for establishing a project's non-load shifting baseline, a standard set of normalization factors (i.e., outdoor temperature, etc.), and a methodology for calculating GHG emission reductions.
- Set the initial commercial unitary HPWH Incentive Value at $700/kWh.
- Provide a $200/kWh kicker incentive for HPWHs using low-GWP refrigerants.
- Set a $50,000 per project incentive cap for commercial unitary HPWHs.

Electrical Panel Upgrade and Electrical Service Incentives

- Commercial customers are ineligible for the electrical panel upgrade panel incentive offered to residential customers.
- Commercial customers are ineligible for the electrical service line and associated electrical distribution infrastructure costs classification as common facilities costs.

Incentive Layering

- Staff recommends reducing the unitary commercial HPWHs incentives by 100 percent of their value for both ratepayer and non-ratepayer funded programs when incentive layering occurs,

Commercial Central HPWHs

Staff propose that commercial central HPWHs not be eligible for SGIP incentive given the uncertain ability of this configuration of HPWHs to shift load from peak to off-peak periods.

Program Administration

Staff propose the following:

- The CPUC selects a single statewide program administrator and program implementor (PA/PI) to oversee SGIP HPWH incentives.
- The organizational structure for the administration of SGIP HPWH incentives consists of three main actors:
    1. **PA Contract Holder:** Staff propose that the CPUC direct Southern California Edison (SCE) to issue a Request for Proposal (RFP) to select a competitive bidding process for a statewide PA/PI for SGIP HPWHs and contract with the winning entity. SCE would then be responsible for providing ongoing fiscal support through the collection, disbursal, and monitoring of SGIP HPWH funds.
    2. **PA/PI:** Staff recommend that a statewide PA/PI be responsible for the execution, coordination, and implementation of the SGIP HPWH budget and program in accordance with the adopted HPWH decision.
    3. **CPUC:** Staff propose that Energy Division Staff lead the confidential evaluation of PA/PI bids and select the winning bidder. Staff would also be responsible for managing the PA/PI and coordinating with the TECH Initiative's quarterly meetings to enable continuous program coordination and market transformation of HPWHs in CA.
- Staff's full proposal at Section 4.6 contains a proposed list of selection criteria for the SGIP HPWH PA/PI bidding process.

Evaluation

Staff propose the following:

- The SGIP evaluator summarize all the benefits achieved by a SGIP funded HPWH. These benefits should include, but are not limited to, the total GHG reductions achieved by the SGIP funded load shifting HPWH, which includes reductions in therm or kWhs, and the peak reduction benefits compared to a non-load shifting HPWH.
- That when incentive layering does occur the non-load shifting benefits (*i.e.*, the efficiency benefits) of SGIP funded HPWHs also be attributed to those other programs (further guidance specific to incentive layering is anticipated to be developed in Phase 2 of R.19-01-011.)
- That the PY 2021-2025 M&E plan include a dedicated HPWH impact evaluation report.