



## Assumptions used in the California heat pump analysis

### System rated efficiency

- Current Gas or Propane Furnace: 85% AFUE
- Current AC: 13 SEER2
- New ASHP: 16 SEER2, 8 HSPF2 in IECC climates 2-4, 9 HSPF2 in IECC climates 5-6 (cold climate ASHP). Variable speed system in all climates.
- Current Gas or Propane Water Heater: 0.70 UEF
- New HPWH: 3.7 UEF, 330% effective efficiency operating in hybrid mode

### Hourly loads and system efficiency

- For each climate zone, a typical single-family home's energy load profile by end use was taken from the National Renewable Energy Laboratory's (NREL) [ResStock](#) for the average home size.
- Hourly AC and ASHP efficiencies were based on reported performance curves for the rated efficiencies above. In IECC climates 5 and 6, cold climate heat pump performance was based on an average subset of 100 common ASHPs listed in the Northeast Energy Efficiency Partnerships' [Air Source Heat Pump \(ASHP\) database](#). The supplemental electric resistance heating element, for cold climate heat pumps only, then covered any unmet heating load.
- Hourly HPWH efficiency was estimated based on reported data from two common electric HPWH manufacturers as found in [HPWHSim](#); this data was also used in [CBECC-Res](#). The electric resistance element then covered any unmet water-heating load based on the hourly water-heating load profile.

### Energy rates

The analysis used utility-specific electric rates sourced from Arcadia's [Signal utility rate database](#), utility-specific gas rates sourced from rate schedules, and [national-average](#) propane rates (CA propane rates are not provided).

- Propane
  - \$2.51/gallon
- Natural gas
  - Space heating: SCG \$1.82/therm, PG&E \$2.57/therm, SDG&E \$2.19/therm (weighted average of 23/24 and 24/25 winters)
  - Water heating: SCG \$1.67/therm, PG&E \$2.43/therm, SDG&E \$2.03/therm (weighted average of March 2024-February 2025)
  - These averages assume [65%](#) of the average customer usage is within the baseline allowance and 35% above baseline
- Electricity
  - Pre ASHP or HPWH: SCE [TOU-D-4-9pm](#), PG&E [E-TOU-C](#), SDG&E [TOU-DR](#), LADWP [1B TOU](#), SMUD [R-TOD](#), Imperial [Residential](#). IOU baseline territories were adjusted based on most common in each climate zone.
  - Post ASHP or HPWH: SCE [TOU-D-PRIME](#), PG&E [Electric Home](#), SDG&E [TOU-ELEC](#), LADWP [1B TOU](#), SMUD [R-TOD](#), Imperial [Residential](#)