



Closing the Affordability Gap

Planning an Affordable Transition Away from Fossil Fuel Heat in the Bay Area & California

Laura Feinstein, SPUR • September 14, 2023



Agenda

- **Urgency of Making Zero-Pollution Appliances Affordable**
- **How Much Does It Cost To Install Zero-Pollution Appliances In the Bay Area?**
- **Takeaways and Recommendations**

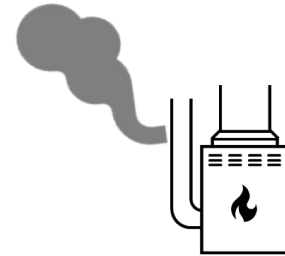
Bay Area Air District Rules

Will require switching to zero-pollution home heating and water heating when old appliances are replaced.



Residential water heaters in 2027; Residential and commercial in 2031

Furnaces (for heating) in 2029



Electrifying Bay Area gas appliances is projected to:



**Reduce climate-warming emissions from appliances
73% by 2046**



**Reduce health-harming nitrogen oxide (NOx)
pollution 89% by 2046**



**Prevent 15,000 asthma attacks and avoid up to 85
premature deaths every year**

Source: Bay Area Air Quality Management District, Rules 9-4 and 9-6 Packet

These Rules are Precedent-Setting

- These are the first rules requiring conversion of existing buildings to zero-pollution appliances
- California Air Resources Board is poised to follow suit if the rules are implemented successfully
- The success of the rules hinges on affordability for low-income households, including renters and landlords who serve them

How Much Does It Cost To Install Zero-Pollution Appliances in the Bay Area?



Methods for Cost Analysis

- **Data sources: real installation data from BayREN and TECH**
- **Looked at Multifamily Buildings with in-unit Heating, Ventilation and Cooling (HVAC) and hot water - true of most multifamily units in the Bay Area.**
- **Incentives for Low-Income Single Family Households and Low-Income Multifamily Buildings (at least half the units occupied by low-income tenants)**
- **Stackable rebates from federal and state sources, BayREN, and the Bay Area's six CCAs**

Net Costs for a Low-Income Single Family Home Silicon Valley Clean Energy Customer

**Has a central ducted gas furnace and room air conditioner
Converting to a central ducted heat pump HVAC**

Installation cost of a central ducted heat pump:	\$19,600
Saves in region-wide incentives:	-\$9,400
Saves in SVCE incentives:	-\$3,500
Saves by not installing a gas furnace or room AC:	-\$7,700
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Installation Costs, post-incentives	\$6,700
Net Savings	\$1,000

Net Costs and Savings for Low-Income Single Family Homes

Zero-Pollution Equipment	Baseline	Net Savings	Net Costs
Central Ducted Heat Pump HVAC	Central Ducted Gas Furnace and Room AC	1. Santa Clara (except San José) 2. Sonoma 3. San Mateo	1. Marin 2. Napa 3. Contra Costa 4. Alameda 5. San Francisco 6. Solano 7. City of San José
Central Ducted Heat Pump	Central Ducted Gas Furnace + Central AC	All Bay Area	None
Heat Pump Water Heater (60 Gal)	Gas Tank Water Heater	All Bay Area	None
Panel Upsize	No Panel Upsize	All Bay Area	None

Net Costs and Savings for Low-Income Multifamily, In-Unit Replacements

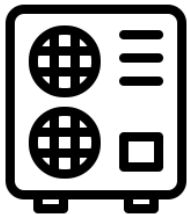
Zero-Pollution Equipment	Baseline	Net Savings	Net Costs
Central Ducted Heat Pump HVAC	Central Ducted Gas Furnace and Room AC	All Bay Area	None
Ductless Mini Split Heat Pump	Wall Furnace and Room AC	All Bay Area	None
Central Ducted Heat Pump	Central Ducted Gas Furnace + Central AC	All Bay Area	None
Heat Pump Water Heater (60 Gal)	Gas Tank Water Heater	All Bay Area	None
Panel Upsize	No Panel Upsize	All Bay Area	None

Takeaways: Affordability of Appliance Installations

- Net savings in most cases
- Solve the affordability gap for heat pump HVAC in single family homes in certain parts of the Bay Area
 - Offer Inclusive Utility Financing - customer pays off more efficient appliance through bill savings
 - CCAs could shift funding from heat pump to HVAC incentives
 - Offer clear regulatory deadlines and consistent incentives to bring heat pump market to scale
- Be mindful of that low-income households have trouble covering any upfront costs, and may need other upgrades to the home
 - Free direct install programs from the California Energy Commission, Community Services Development, and Peninsula Clean Energy

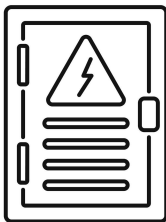
Electrical Service Upsizing

Electrification Retrofit



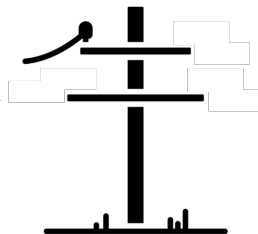
triggers

Panel Upsize



triggers

Electric Service Upsize



Costs: \$3,000 - \$46,000 (NV5 and Redwood Energy 2022)

Number of homes requiring an upsize: 5-50% (SPUR analysis of panel data from three incentive programs)

Takeaways: Electrical Service Upsizing

Electrical service upsizing is wild card for costs of zero appliance installation.

Better understand how often panel and service upsizing are necessary.

Avert unnecessary electrical panel and service upsizing with [watt diet strategies](#).

Shift some of the costs for electrical service upgrades that are paid by customers to ratepayer funds, similar to EVs.

Thank You

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In Most Cases, Low-Income Single Family Homes Save Money By Installing Heat Pumps

Zero-Pollution Equipment	Baseline Equipment	Zero-Pollution Cost (2022\$)	Zero-Pollution Cost After Regional Incentives	Baseline Cost	Net (Cost) or Savings, without CCA incentives	Locations with Net Savings, after CCA incentives	Locations with Net Costs, after CCA incentives
Central Ducted Heat Pump HVAC	Central Ducted Gas Furnace and Room AC	19,600	10,200	7,700	(2,500)	Santa Clara (except city of San José), Sonoma, and San Mateo	Marin, Napa, Contra Costa, Alameda, San Francisco, Solano, and city of San José
Ductless Mini Split Heat Pump	Wall Furnace and Room AC	15,400	6,000	4,500	(1,500)	Santa Clara (except city of San José), Sonoma, San Mateo, Marin, Napa, and Contra Costa	Alameda, San Francisco, Solano, and city of San José
Central Ducted Heat Pump	Central Ducted Gas Furnace + Central AC	19,600	10,200	13,600	3,400	All Bay Area	All Bay Area
Heat Pump Water Heater (60 Gal)	Gas Tank Water Heater	6,300	0	2,900	2,900	All Bay Area	All Bay Area
Panel (SFH)		3,000	0	0	0	All Bay Area	All Bay Area

Low-Income Multifamily Buildings Save Money By Installing Heat Pumps

Location		Zero-Pollution Equipment	Baseline Equipment	Zero-Pollution Cost (2022\$)	Zero-Pollution Cost After Incentives	Baseline Cost	Net (Cost) or Savings, without CCA incentives
In-Unit		Central Ducted Heat Pump HVAC	Central Ducted Gas Furnace and Room AC	19,600	7,350	7,700	350
In-Unit		Ductless Mini Split Heat Pump	Wall Furnace and Room AC	15,400	3,150	4,500	1,350
In-Unit		Central Ducted Heat Pump	Central Ducted Gas Furnace + Central AC	19,600	7,350	13,600	6,250
In-Unit		Heat Pump Water Heater (60 Gal)	Gas Tank Water Heater	6,300	0	2,857	2,857
In-Unit		Panel		4,000	0	0	0

Will Costs for Zero-Pollution Appliances Come Down?

