East Bay Multifamily Retrofit Benefits Climate and Tenants

A model of power efficient design + Air District Appliance Rule early compliance

By Angela Evans, Program Director, Menlo Spark
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Executive Summary

A five-plex rental on 63rd Street in Berkeley sits a couple of blocks from Martin Luther King Drive, containing 1 and 2-bedroom units of roughly 750 sq feet/unit. Built in 1961 and acquired only a few years ago by building owner, Preeti T., the building offers what many refer to as "naturally occurring affordable housing" at rents lower than those of the regional market but not formally regulated by federal or state affordable housing entities. Tenants pay their own monthly utility bills.

In collaboration with the nonprofit, Menlo Spark, the Association for Energy Affordability (AEA), BayREN, and contractor, GLD Green Energy, the building owner at 63rd removed all of her units' gas appliances, then replaced these with more efficient, heat pump electric versions. The building owner then engaged PG&E to cap and end the flow of all gas to the property. As of December 2025, 63rd now operates with 100% clean energy per AVA Clean Energy's electricity, free of climate pollution and hazardous air pollution.

The retrofit deployed a power efficient design, including 120–volt heat pump water heaters and other heat pumps, enabling the full electrification of each of its five units, all on a 200 amp main panel. There was no need to upsize the 200 amp main panel, which also enables flexibility to include EV charging in the future. Moreover, the building owner plans to add an all-electric sixth unit to the building in the coming year and can also do so without the need to upsize the main panel. The avoidance of a main electrical panel upsizing eliminated substantial extra costs and delays, debunking the myth that older buildings can not easily accommodate electrification. Instead, the retrofit at 63rd shows that full electrification is not only possible on existing main panels but is also easily achievable on relatively small main panels (including those from the 1960s), with flexibility to spare for increased electrical load in the future.

Unlike their previous gas counterparts, the newly-installed electric appliances – including heat pump water heaters and heat pump HVAC systems – no longer generate nor leak chemicals deemed hazardous to human health, like nitrogen oxides (NOx), benzene, and carbon

monoxide. The elimination of this chemical pollution greatly benefits the community and its tenants, one of whom reported a carbon monoxide poisoning from a leaky gas wall heater many years ago.

Moreover, the new two way heat pump HVAC systems, unlike the old gas wall furnaces that provided only home heating, will provide air conditioning for the very first time within these residences. This air conditioning will enable crucial resilience and air filtration during extreme heat and poor air quality days.

Menlo Spark provided, with support from the Hewlett Foundation, a one-time grant to cover a portion of upfront capital costs. In partnership with AEA, 63rd also obtained subsidies from the BayREN Bay Area MultiFamily Building Electrification (BAMBE) program and TECH Clean California Multifamily Incentives.

In December 2025, several senior staff and board members of the Bay Area Air District attended a Menlo Spark-led tour of the building shortly after the completion of this retrofit. Menlo Spark received positive, encouraging responses from attending Air District board members, who spoke about the building at its next public Stationary Source Committee meeting later that month. The tour demonstrated how early compliance with Air District Zero NOx Appliances Rules 9-6 and 9-4, for residential water heaters as of 2027 and residential furnaces as of 2029 respectively, can be accomplished with positive outcomes to tenants, building owners, and the neighboring community.

Here is Menlo Spark's one page flyer on 63rd with photographs.

Quotes provided by key stakeholders in this project:

"I really enjoy the hot water from my new heat pump water heater. My old gas water heater used to 'freeze up' while I was in the shower, but the new heat pump water heater provides hot water much more consistently. I also enjoy the new A/C from my heat pump HVAC system; the cooling works very efficiently and helps me on hot days. These units also help to protect my health and our planet, and that's something I appreciate." – ***Kayly, 63rd tenant***

"I am very happy with the new electric heat pump water heaters and heat pump HVAC systems inside each of the five units at 63rd St, a 1960's era building. We used a basic, power-efficient design that very easily allowed me to replace all gas appliances with electric versions while avoiding a main electrical panel upsizing. We kept the main panel at 200 amps, saving me considerable time and expense." - ***Preeti T., 63rd building owner***

"Our electrification work at 63rd St was done smoothly, quickly, and on budget. We know that heat pump appliances are superior to gas versions, providing improved comfort, efficiency, and health benefits to homeowners and tenants. GLD Green Energy is ready to expand this home electrification work throughout the Bay Area!" - ***Kelvin Hong, Partner, GLD Green Energy***

“The electrification work at 63rd St. shows us how we can efficiently retrofit older buildings, reaping enormous health benefits for tenants while reducing climate pollution.” - ***Angela Evans, Program Director, Menlo Spark***

"We call it 'The Four Ps - Pilot Projects Precede Policy' and that's exactly what we see here. This pilot project not only shows that the Bay Area Air District policies to reduce building emissions are achievable, it goes far beyond the policies and does it years in advance. We've shown these policies can succeed." - ***Brian Schmidt, Executive Director, Menlo Spark***

Scope of Work

Full electrification: replacement of all gas appliances with high efficiency electric versions
In each of the five dwelling units within 63rd, the following gas appliances were removed and replaced with clean, healthy, more efficient electric appliances. 63rd no longer includes gas combustion appliances, enabling the building owner to cap all gas lines to the property.

- Gas wall furnaces replaced with Gree Minisplit electric HVAC units (12,000 Btu/H; SEER2 24.5, HSPF2 9.5);
- Gas water heaters replaced with AO Smith 120-volt electric heat pump water heaters (66 gallon; UEF 3.2);
- Gas clothing dryers and washing machines replaced with electric 120-volt plug-in Samsung Bespoke All-in-One Combo Washer/Dryer with heat pump technology (5.4 cu feet). Note that these laundry replacements were undertaken in two units only as other units already had electric resistance machines that do not use gas.
- Note that all units already included all-electric ranges with induction or electric resistance stovetops; therefore no gas to electric replacements were needed here.

Each of the five units began with only one gas wall heater, located in the main hallway of each unit, near the kitchen and living spaces but down the hall from the bedrooms. The heat pump minisplit replacements were placed in a similar location within the hallways of each unit, with the associated heat pump compressors placed on the roof of the building. AEA decided to improve comfort for tenants further by installing additional heating and cooling capacity in the form of “transfer fans” that enable some of the heating and cooling from the minisplit to extend to output fans atop each bedroom door. AEA could have accomplished a similar goal by installing additional minisplits near the bedrooms but deployed transfer fans as cost reduction pilot, designed to inform potential methods to reduce costs of future electrification retrofits. Note that Air District Rule 9-4 for residential furnaces will likely only require a one to one replacement of a gas wall heater with a zero-NOx version; therefore, AEA’s decision to extend heating and cooling capacity via these transfer fans to the bedrooms goes beyond future compliance with Rule 9-4. See section below on associated costs.

All gas water heaters were originally located in utility closets, also in the main hallway, and were replaced by 120-volt heat pump electric versions in the same closet. 120-volt heat pump water heaters can simplify electrification retrofits by their “plug and play” functionality; each heat

pump water heater was plugged into existing outlets within these same utility closets, no extra wiring required. The heat pump water heaters did require new venting on the utility closet doors, though future retrofits could also consider methods to vent to the outside of the building instead of into the hallways. Some door reframing was also necessary to accommodate the new water heater in this space, adding additional costs to the project. Note that the Air District has proposed project-based exemptions for space constraints in its October 2025 Concept Paper for Rule 9-6 for water heaters; if future building owners need to invest extra funds to expand utility closets to accommodate a new zero-NOx water heater, these building owners may be eligible to apply for an exemption to compliance with Rule 9-6. See section below on associated costs.

The retrofit included the removal of all gas clothing dryers, one of which was located in a main utility room within the building (yet used by only one tenant), and two of which were located inside individual units. Other units already had all electric systems, including electric resistance washing machines and electric resistance dryers; these electric resistance systems were kept intact. All of the gas clothing dryers and their washing machine counterparts were replaced with 120-volt electric heat pump combination washer/dryer appliances that use heat pump technology. Similar to the 120-volt heat pump water heaters, 120-volt washer dryer appliances can be plugged into existing outlets, no extra wiring needed. Moreover, these appliances enable washing and drying in the same machine receptacle, thereby taking up considerably less space than their less efficient alternatives.

EV charging can come next

Although the building owner chose not to add EV charging to 63rd at this time, the building owner may choose to do so in the future, with ample space remaining on its electrical panels for Level 1 or Level 2 charging with the addition of a circuit pauser. See section below on Power Efficient Design for more details. The circuit pauser can enable EV charging to share its usage with another appliance on the same circuit, like laundry machines, allowing tenants to pause EV charging while doing laundry (or vice versa). Note that Level 1 chargers (just a typical outlet) can be installed at multifamily properties at a much lower cost than that for Level 2 chargers, still adding meaningful vehicle charging capabilities for residents. Level 1 outlets can charge an EV at a rate of about 3.5 to 6.5 miles of driving range per hour of charging time, likely enabling enough overnight charge for most Bay Area daily commutes.

Zinsco sub-panels replaced for safety (same capacity, no upsizing needed)

See section on power efficient design for more detail on the building's 200 amp main panel, which serves all five units and did not require upsizing to accommodate full electrification.

The original Zinsco-branded subpanels for each unit (each at 55 amps or 60 amps) were replaced with like-for-like capacity versions because the building owner's insurance company required replacement with a different brand. Zinsco panels were recalled by their manufacturer long ago and can cause safety risks; thus, the insurance company required the removal of Zinsco subpanels before an insurance policy renewal. Note that the required subpanel replacements were unrelated to the building owner's decision to electrify appliances; the Zinsco subpanels would have required replacement even if the building owner had replaced the old gas

appliances with new gas appliances. No new electrical capacity was added during the subpanel replacements.

Costs and Subsidies

The tables below reflect costs incurred and subsidies received for the entire project. Given that a large portion of Menlo Spark's objective in this retrofit involved educating Air District staff and board members on cost of compliance with future implementation of Appliance Rules 9-6 and 9-4, the tables break out relevant costs accordingly. Specifically, the tables break out the individual and total costs of the water heater replacements, the individual and total costs of the furnace replacements, plus the costs of additional measures undertaken that would not have been required by Rules 9-6 and 9-4 upon implementation in 2027 and 2029 respectively.

Note that these Appliance Rules will mandate a zero-NOx version at replacement only, meaning that building owners can replace one gas appliance at a time as needed, not necessarily incur the total costs of replacing all of the relevant gas appliances at once. For example, the table shows that the cost of replacing one gas water heater with a zero-NOx, electric heat pump version was approximately $5,926/unit plus an additional $1,595/unit to reframe each door and install necessary ventilation slats into the utility closet door. The table also shows that the cost of replacing one gas wall heater with a heat pump minisplit was approximately $6,480/unit. During the building tour, an Air District staff informed Menlo Spark that these per unit costs are on par with average costs estimated by the district for appliance replacements of this kind.

See tables below:

Early Compliance for Bay Area Air District Appliance Rules 9-6 and 9-4
Zero NOx Water Heater and HVAC Electrification Costs at 63rd St (5-Plex)

	Total	Approx Cost Per Unit
Costs*		
Gas Water Heater Removed: Replaced by 120V Heat Pump Water Heaters	$29,629	$5,926
Water Heater Closet Adjustments (door reframing/ventilation)	$7,975	$1,595
Gas Wall Heater Removed: Replaced by Heat Pump HVAC (nonducted, minisplits)	$32,400	$6,480
Main Panel Upgrade? Not Needed Due to Power Efficient Design	$0	$0
Permits	$532	$106
Total 9-6 and 9-4 Early Compliance Costs	**$70,536**	**$14,107**

** Heat pump water heater and heat pump HVAC costs include both equipment and labor.*

Other Costs Unrelated to Rule Compliance (or Beyond Rule Compliance)

	Total	Approx Cost Per Unit
Transfer Fans for HVAC to Bedrooms	$6,950	$1,390
Heat Pump Washer Dryer Combo Units (in 2 units only; 3rd installed later; 4th/5th had electric already)*	$4,617	$2,309
Electric Ranges (none needed; existing ranges already electric)	$0	$0
Unrelated to Electrification: Replace Recalled Zinsco SubPanels with Same Capacity Subpanels**	$11,000	$2,200
Subtotal, Other Costs	**$22,567**	**Varies based on washer/dryer**

** Tenant in third unit requested postponment for laundry installation, though electrical loads model its inclusion.*
***These subpanel replacements costs are not related to electrification and would have been necessary even with gas replacements, per insurance policy.*

Subsidies

	Total	Approx Cost Per Unit
BayREN BAMBE	$25,500	$5,100
CA TECH (Multifamily)	$24,500	$4,900
Menlo Spark Grant	$30,000	$6,000
Subtotal Subsidies	**$80,000**	**$16,000**
Total Costs Less Subsidies (out of pocket, building owner)	**$13,103**	**$2,621**

Electric Heat Pump Benefits: Climate, Health, Safety, & Efficiency

The removal of gas appliances in buildings with electric, heat pump versions provides enormous benefits to the climate, public health, tenant health/safety, and overall building efficiency. After completing its first full multifamily electrification pilot at Willow Court in Menlo Park's Belle Haven neighborhood in 2024, Menlo Spark sought another collaboration with AEA and BayREN with a focus on early compliance with Bay Area Air District Zero NOx Appliance Rules and the myriad electrification benefits outlined in Menlo Spark's Willow Court Case Study (also described below).

"Natural" gas is methane, a greenhouse gas significant to global warming
Energy used by buildings comprises approximately one-third of climate pollution across the globe (27% in the City of Berkeley and over 40% in the City of Menlo Park) due to buildings' large consumption of the fossil fuel, methane (also known as "natural gas", an industry term). Methane fuels buildings' combustion appliances: furnaces, water heaters, clothing dryers, and ovens/stoves. The United Nations Intergovernmental Panel on Climate Change (IPCC) reports have repeatedly identified methane as an essential priority for drastic reductions under any scenario designed to avoid global temperature increases beyond 1.5 degrees Celsius (per the Paris Accord).

Methane usage creates three major challenges to health and safety: 1) its combustion presents health hazards from leaked benzene and combustion pollutants like nitrogen dioxides and carbon monoxide; 2) its combustion consumes oxygen and converts it to planet warming carbon dioxide (CO_2); 3) its drilling wells, processing, storage and pipelines all leak methane that is, for each molecule, about 25 times more climate disrupting than even the molecules burnt to form CO_2 As timelines to avoid global climate catastrophe shrink, we must target the fossil fuels (e.g., methane) that cause the most damage in the short-term or otherwise risk irrevocable global damage (IPCC reports).

Methane and public health: pollution inside and outside of buildings
Eliminating gas (methane) consumption in buildings also yields enormous public health benefits, especially for young children. Peer-reviewed, scientific studies now show that burning methane to fuel appliances causes outdoor and indoor air pollution that contributes significantly to asthma, cardiac, and other diseases and fatalities due to NOx, benzene, and carbon monoxide exposures. Gas appliances in California homes and buildings generate four times more lung-damaging NOx pollution than the state's gas power plants. Moreover, gas appliances in *Bay Area* homes and buildings generate more NOx pollution than amounts generated by all of the region's passenger vehicles combined. Recent analyses demonstrate that these gas appliances leak significant levels of methane inside and outside of homes and buildings, even when the appliances are turned off.

Especially noteworthy are the related and now well-documented environmental justice concerns, given that communities of color often suffer much more so from pollution than their

wealthier counterparts. These same communities lack resources for in-home air filtration and adequate health care to address health concerns caused by this pollution, further exacerbating disparities.

Building electrification generates immediate climate pollution reductions
Building electrification immediately reduces climate pollution by eliminating gas appliances and replacing them with more efficient versions that use electricity instead. In our region, local electricity providers (Ava Community Energy, Peninsula Clean Energy, Silicon Valley Clean Energy, and others) provide 100% climate-pollution free, clean energy. The rest of the California and national electric grids are already becoming much cleaner (and at rapidly increasing rates from investments in new renewable energy sources), making building electrification a crucial priority to address climate change.

Building electrification eliminates safety hazards from gas combustion
The combustion of gas via appliances within homes and buildings poses significant risk to occupants from potential gas leaks, improper ventilation, and general fire risk. In fact, in 2021, AEA documented combustion safety data from 99 buildings served by the BAMBE and Low Income Weatherization Programs (LIWP), concluding that 23 of those buildings failed about 10% of the time. Of the 1,209 dwelling units inside the buildings tested, 49% failed combustion safety standards. The removal of all gas combustion in multifamily buildings thus not only improves occupants' overall safety but also reduces the building owner's liability.

Electric heat pump technology: proven and highly efficient
Thanks to decades of manufacturing advances, electric heat pump technology (for HVAC systems and water heaters, which generate the most climate pollution from burning gas in buildings) have now been fully mainstreamed into leading manufacturer brands. These heat pumps provide durable appliance solutions far healthier and more efficient than their older gas versions. In fact, heat pump water heaters and HVAC systems are 3-4x more efficient than their gas counterparts. Thus, building residents using heat pump, electric appliances need significantly less energy to achieve the same amount of power in their homes.

Power Efficient Design & Avoidance of Main Panel Upsizing

Menlo Spark deployed a variety of power efficient design tools described below to help 63rd undergo full appliance electrification without necessitating a main panel upsizing. Despite the misleading myth perpetuated by some that appliance electrification, especially for water heaters and HVAC systems, will necessitate main panel expansions, 63rd demonstrated the opposite outcome, saving considerable expense and time. A 1960s-era building built originally with a relatively small main panel (200 amps) to serve all five of its units, 63rd successfully avoided a main panel upsizing, with flexibility to spare to add more electrical appliances in the future. In fact, the building owner plans to build a new, sixth unit at the property in the coming year, also with all electric appliances. The electrical demand expected by this sixth unit was added to mathematical electrical load totals to ensure that a 200 main amp panel would

continue to suffice. See load calculation tables below for both five- and six-unit scenarios modeled.

The avoidance of a main panel upsizing, despite full electrification of five (and soon to be, six) units, aligns well with the conclusions reached in a variety of publications and sources on deploying power efficient design strategies to avoid otherwise unnecessary panel upsizing, including SPUR's "Solving the Panel Puzzle", Redwood Energy's "Electrification of Homes without an Electrical Service Upgrade", and Peninsula Clean Energy's "Design Guidelines for Home Electrification". Moreover, this outcome at 63rd is consistent with Menlo Spark's Willow Court retrofit, which similarly used power efficient design to eliminate the need for panel upsizing.

Power Efficient Design Tools Deployed at 63rd to avoid a main panel upgrade

- Selection of highly efficient heat pump technology, appropriately-sized for electricity demand, including:
    - 120-volt heat pump water heating;
    - Heat pump HVAC mini splits for heating and cooling;
    - 120-volt combination washer /dryer machines;
    - Electric induction ranges (already installed, prior to Menlo Spark's involvement)
- Usage of NEC 220.84 for "Other Multifamily" to calculate electrical loads, described in more detail below.

Usage of NEC 228.84 for "Other Multifamily" for electrical load calculations

Menlo Spark's usage of NEC 220.84 for load calculations, an optional code for multifamily buildings with in-unit appliances, in combination with a power efficient electrification design detailed above, was integral to avoiding the expense and delay of a main panel expansion.

Given the "optional" nature of this NEC 220.84 code for multifamily buildings with in-unit appliances, it is Menlo Spark's anecdotal observation that NEC 220.84 may be underused by some contractors in favor of other NEC codes, despite the fact that NEC 220.84 provides more load calculation flexibility to help to avoid a main panel upgrade. NEC 220.84 analyzes loads using a more realistic and less exaggerated assumption of maximum simultaneous, full-power use of all equipment at the same time compared to other load calculation techniques for multifamily buildings with in-unit appliances. Using other relevant NEC codes to model loads may have resulted in a main panel expansion, significant delays, and likely exceeded the budget available for this project.

Another very useful code section in this context is the optional method NEC 220.87 for using existing electric load history with 60 minute or 15 minute interval data to determine the amount of unused available panel capacity in which to add new appliance load at its full nameplate rating. Because the coincidence factors used in NEC 220.84 are conservative compared to real life, NEC 220.84 can still overestimate panel loading. In those cases, NEC 220.87 is useful for getting flexibility to add loads when the 220.84 method indicates the panel is already "full".

Note in the electrical tables below that the "demand factor" specified for usage by NEC 220.84 varies with the number of units serviced in the multifamily building. As the number of units modeled increases (in this case, from five units to six), the demand factor slightly decreases to account for more opportunities to diversify electrical loads throughout housing units without exceeding total capacity available. The demand factors and number of relevant units are highlighted in red text in the calculations to demonstrate this detail.

Power efficient design tools for consideration in the future to add more flexibility

- **Circuit pauser/power sharing devices:** Future electrical load from EV charging, which the 63rd building owner has expressed interest in adding in the future, can be added with a circuit sharing device that pairs with unit laundry machines, enabling a unit's laundry to pause during EV charging (or vice versa). For more details on circuit sharing devices and how they work to balance loads, see here.
- **Eliminate remaining electric resistance dryers for more efficient heat pump units:** a few of the units at 63rd kept their electric resistance clothing dryers and stand-alone, traditional electric washing machines. When those machines reach the end of their useful lives, the building owner can consider more efficient replacements with 120-volt washer dryer combination units with heat pump technology, like those installed in some other units as described above. Electric resistance dryers avoid the negative health and climate impacts of gas dryers but are still very inefficient compared to heat pump electric alternatives; thus, these future replacements can free up considerably more space on the relevant electrical panels.

See tables below:

Electrical Loads for 63rd St Using Two Different Scenarios (5- and 6-plex)

6-plex shown with green title (on top); 5-plex shown with purple title (scroll down below)

Electrical Load Calculations for 63rd St., Berkeley 6-Plex
Using NEC 220.84 (for Multifamily Dwellings with 3+ units)

	Sq feet	#	VA Each	VA	
General lighting (Sqft X # VA/Sqft)	800	6	3 W/ sqft	14,400	
Small Appliance Circuit (2/unit)		12	1500	18,000	
Electric Resistance Washing Machine		2	1500	3,000	
Electric Resistance Dryer		2	5000	10,000	
120 volt Washer/Dryer Combo Unit		4	1500	6,000	
Fixed Appliances					
Garbage Disposal		0	500	-	
Built-in Microwave		0	1200	-	
Dishwasher		0	972	-	
				-	
Other Loads					
Electric Range (Traditional; not induction)		6	7200	43,200	
Induction		0	1500	-	
EV Electric Vehicle Charger		0		-	
Water Heater (120 volt heat pump)		6	900	5,400	
HVAC (heat pump), mini split		6	1560	9,360	
Total Service Load Volt-Amperes (VA) =			Subtotal	109,360	
			X Demand Factor	44%	VA Counted
			Total	48,118	VA Counted
				200	**Total VA/240 volts**
Total Amperage Needed Per Unit				**33**	
Total Amperage Across All Six Units				**200**	

NEC 220.84 weighs all loads at the demand factor of 44% for multifamily buildings with 6-7 units.

Electrical Load Calculations for 63rd St., Berkeley 5-Plex
Using NEC 220.84 (for Multifamily Dwellings with 3+ units)

	Sq feet	#	VA Each	VA	
General lighting (Sqft X # VA/Sqft)	800	5	3 W/ sqft	12,000	
Small Appliance Circuit (2/unit)		10	1500	15,000	
Electric Resistance Washing Machine		2	1500	3,000	
Electric Resistance Dryer		2	5000	10,000	
120 volt Washer/Dryer Combo Unit		3	1500	4,500	
Fixed Appliances					
Garbage Disposal		0	500	-	
Built-in Microwave		0	1200	-	
Dishwasher		0	972	-	
				-	
Other Loads					
Electric Range (Traditional; not induction)		5	7200	36,000	
Induction		0	1500	-	
EV Electric Vehicle Charger		0		-	
Water Heater (120 volt heat pump)		5	900	4,500	
HVAC (heat pump), mini split		5	1560	7,800	
Total Service Load Volt-Amperes (VA) =			Subtotal	92,800	
			X Demand Factor	45%	VA Counted
			Total	41,760	VA Counted
				174	**Total VA/240 volts**
Total Amperage Needed Per Unit				**35**	
Total Amperage Across All Five Units				**174**	

NEC 220.84 weighs all loads at the demand factor of 45% for multifamily buildings with 3-5 units.

Estimated Tenant Utility Bill Savings

63rd tenants, who pay their own monthly utility bills, no longer receive a gas bill due to the removal of all of their gas appliances. The elimination of the gas bill includes the removal of any monthly fixed gas service charges plus the variable $/therm charges.

A 2025 report from the Rocky Mountain Institute (RMI) predicts an average utility bill savings of approximately $30/month after replacing gas appliances with heat pumps. The report, which documents predicted savings in counties throughout California, included 63rd's Alameda County, also at an estimated $30/month savings. This RMI analysis is reinforced by Silicon Valley Clean Energy's 2025 home electrification bill impact analyses in the Bay Area.

The RMI report also predicts even larger bill savings for low income Californians who qualify for and enroll in the California Alternate Rates for Energy (CARE) or Family Electric Rate Assistance (FERA) ratepayer assistance programs because these programs provide larger discounts for electricity than the discounts provided for gas. The CARE program offers a 30 to 35 percent discount on electric bills, compared to a 20 percent discount for gas bills; FERA provides an 18% discount on utility bills and no discounts on gas rates. Publicly owned utilities that do not participate in CARE offer their own income-qualified rates, such as the Sacramento Municipal Utility District's (SMUD) Energy Assistance Program Rate, which provides electric bill discounts of up to $105 per month.

Unlike 63rd, which did not have access to air conditioning (cooling) prior to this retrofit, the homes analyzed in the RMI report had older, inefficient air conditioning units prior to the installation of their new heat pumps. Therefore, 63rd tenants will likely incur some new costs associated with using brand new cooling access for the first time, though some of these costs can be offset by potentially reduced heating bills during other times of the year, given the increased efficiency of heat pump heating over old gas heating equipment. Nevertheless, tenants at 63rd were advised on how to use their new air conditioning judiciously if necessary, including budget-conscious options such as turning air conditioning on only during extreme heat days or as deemed essential by the tenant.

Selecting a new electricity delivery rate: key to unlocking monthly savings

A key element of achieving bill savings after removing gas appliances and installing heat pumps involves the selection of new electricity delivery rate plans offered by PG&E (or other utilities, if outside of PG&E territory). PG&E offers a number of different rate plans, including E-ELEC, which may reduce monthly bills for residents based on a number of variables, including historic usage totals, time of usage, and ratepayer assistance program enrollment.

PG&E offers the Home Intel program to help existing PG&E customers choose an optimal rate plan based on prior utility bill data. The program works directly with individual residents (in English or Spanish) to examine prior Smart Meter power usage and determine the lowest cost rate plan for future usage. Though the program typically requires 12 months of prior Smart

Meter data, energy coaches can work with residents to make decisions with partial year data. Paid by PG&E, Home Intel does not sell products or services and provides advice free of charge.

Menlo Spark attended an AEA-sponsored event for 63rd tenants, organized and led by staff at StopWaste.org. The event educated tenants about the health benefits of their new appliances and provided tips on how to use their new appliances effectively. A large focus of this event included information to tenants on why and how to consider choosing a new PG&E electrical delivery rate, including a description of the PG&E HomeIntel program to help with this process. StopWaste staff leading the event also offered to register tenants for the CARE or FERA programs, providing the necessary forms and guidance on how to fill them out. One 63rd tenant took this opportunity to fill out the CARE forms provided, mentioning that she had been meaning to register for CARE for quite some time but had not yet done so. Tenant education events like the one provided by StopWase will continue to be instrumental in helping tenants achieve utility bill reductions after acquiring new heat pump appliances.

Conclusion

The 63rd retrofit showcases early compliance with Bay Area Air District Appliance Rules 9-6 and 9-4, demonstrating how a power efficient electrification design can easily eliminate the need for a main panel expansion, all while providing substantial greenhouse gas reductions and a myriad of health and other benefits to building tenants.