

#### Heat Pumps & Hot Water Heaters Mon Jan 23, 6pm

- 1. Overview & Heat Pumps 101
- 2. San Leandro resident experience
- 3. Rebates & Incentives
- 4. Resources to check out
- 5. Q&A



# **RESILIENT HOME WEBINAR SERIES**

#### Learn how to become more sustainable while saving money!









Go Solar Now with New Incentives Monday, Jan 9 6 pm Heat Pumps & Hot Water Heaters Monday, Jan 23 6 pm Induction Stoves: Greener & Healthier Monday, Feb 6 6 pm

Greywater Basics: Laundry to Landscape Monday, Feb 20 6 pm

#### In Partnership with:





RSVP at: sl2050.org/resilienthome





## Heat Pumps 101

Chris Hunter, StopWaste

January 23, 2023

#### Who is StopWaste?



- Countywide public agency with 17 member agencies representing Alameda County, its 14 cities, and 2 sanitary districts
- Outreach & education for residents and businesses
- Key Programs:
  - Enforce Mandatory Commercial Recycling & Composting Law
  - Food Waste Reduction and Home Gardening
  - Household Hazardous Waste
  - K-12 Environmental Education
  - Green Buildings & Energy Council
  - Support Member Agency Staff
  - ...and more!



# The Bay Area Regional Energy Network (BayREN)

BayREN is a highly effective and trusted group of local governments that deliver targeted, integrated, and regional-scale climate solutions focused on energy, water, and resilience.







# The Changing Energy Market

What does this mean for you in the short- and long-term?

#### Getting to a Zero-Emissions Energy Sector



#### **Rise of Renewables**





Source: U.S. Energy Information Administration

BUSINESS INSIDER

## **Electrification Policy**

- San Leandro currently developing all-electric "reach code" for new construction
- Other jurisdictions considering strategies to electrify existing building stock
- CA to ban sale of new gas furnaces and water heaters in 2030 – could be sooner in Bay Area



## What Does This Mean?

- Time-of-Use (TOU) Electricity Rates
- Gas prices = more unpredictable in short-term, more expensive relative to electricity in long-term
- Need for resilience:
  - Power shut-offs / PSPS events
  - "The Big One"
  - Indoor air quality
  - Extreme heat





# Envisioning a Zero-Emissions Home

What is residential decarbonization and how will you benefit?



#### How does your home use energy?



#### Getting to a Zero-Emissions Home



#### **Examples of Building Issues**

Old & inefficient furnace or A/C

High energy bill

Drafty rooms & temperature swings

Pest infestations



Mold & mildew

Exposed wiring

Smoke intrusion

Noise pollution

### Efficiency first!



Source: U.S. Department of Energy

#### **Electrify Everything**



Heat pumps for space heating and cooling



Heat pump water heaters



Induction cooktops



Heat pump clothes dryers



#### Non-Climate benefits of an all-electric home

Health	Safety	Comfort	Utility bill saving
<ul> <li>Burning natural gas emits harmful indoor air pollutants into the home</li> <li>Children in homes with gas stoves are 24-42% more likely to develop asthma (RMI)</li> </ul>	<ul> <li>Zero risk of gas leaks or explosions</li> <li>Reduced risk of burns</li> </ul>	<ul> <li>Heat pumps provide dual heating and cooling</li> <li>Electric appliances can be quieter than gas and produce less residual heat</li> </ul>	<ul> <li>Heat pumps are 3-5x more efficient</li> <li>Leverage off-peak TOU pricing</li> <li>Pair with solar + storage to generate your own electricity</li> </ul>

## What Is a Heat Pump?

#### How Heat Pumps Work





- Gas furnaces make heat, heat pumps move heat
- Like a refrigerator or air conditioner in reverse

#### How Heat Pumps Work

- Refrigerant fluids absorb ambient heat
- Condenser forces it to release heat, like wringing out a towel

#### **HEAT PUMP**



grizzlehvac.com

## Heat Pumps for Heating & Cooling



Ductless mini-split system



Source: EnergySTAR

- ~300% efficient (gas furnaces range from 70-95% efficiency)
- Provide heating AND cooling
- Much more quiet than gas or electric resistance

#### Heat Pump Water Heaters (HPWHs)





- 300-400% efficient! (gas is 80-90% efficient)
- Can connect to the grid demand response

## **Electrical Panel Upgrades**

- Before adding new electric load, make sure your home has the capacity
- Most homes have 100-200 Amp panels, depending on the size and age of the home
- Most 200A panels have capacity for full electrification
- It's possible to electrify with a 100-150A panel, but you may need to get creative!
- Cost of service upgrade typically ranges from \$1,000-\$3,000

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240	14	Hybrid Heat	20	30	Heat Pump HVAC	20	240
240	40	Range (cooktop +oven)	50	25	യള്ള EV Charger	20	240
240	12	Heat Pump Water Heater	20	20	星 Solar Input	16	240

Source: Redwood Energy



#### **Homeowner experience - Nicole**

#### **Planning ahead**

- Need to replace/add furnace or A/C?
- Consider also increasing home efficiency through insulation and air sealing
- Home size and layout deciding between ducted system (whole house) vs mini-splits (specific rooms)





#### **Financial Considerations**

- How much are you currently paying for electric and gas to heat and cool your home?
- Do you have solar panels/battery, or are planning to install?
- Pay with cash, home equity, loan?
   REEL energy financing
- What rebates are available?





# Talk to contractors, get quotes, plan system

- Contractor will test/measure the house, create layout, calculate heating and cooling loads
- Determine sizing of equipment and ductwork needed
- Do you want to combine with other efficiency upgrades?





#### My system:

- Ducted outdoor unit + air handler in crawlspace
- Complete replacement of ducts, changed location of air intake and some registers
- Combined with install of vapor barrier and air sealing in crawlspace





#### **My Financial Snapshot**

#### (All numbers rounded)

ltem	Upfront Cost	BayREN rebate	TECH CA rebate	Total Paid	Additional 2023 incentives *possible, depends on income and total project cost
Heat pump + labor, permits, engineering calcs, measurements	\$17,800	\$0 (no existing A/C)	-\$3000	\$14,800	up to \$10,000 (\$8000 rebate + \$2000 tax credit)
Duct replacement	\$11,400	-\$950		\$10,450	
Air sealing/vapor barrier in crawlspace	\$4,100			\$4,100	\$1600 tax credit
Total	\$33,300			\$29,350	



#### **My Experience**

- Heat pumps run for longer period of time to get to temperature, not very hot or very cool air blowing out of vents
- Very quiet
- Bonus better indoor air quality
- Hottest and coldest days:
  - 2022 summer heat waves: outdoor temp >100°, house stayed at 78°
  - Coldest days this winter: efficiency dropped around 30°-40°, house still heated up and stayed warm, but it took longer





Simple ways to a healthier, more efficient and comfortable home



## **Rebates and Resources**

#### **BayREN Home+ Program**

- Up to \$5,000 in rebates for energy efficiency upgrades
  - Includes weatherization & building shell measures, heating and cooling systems, water heaters, induction cooktops and other consumer appliances
- No-cost Home Energy Advisor service
- Network of trained participating contractors
- Learn more: www.BayREN.org/homes

#### BayREN Home+ Heat Pump Rebates

Measure	Rebate
Heat Pump Water Heater	\$1,000
Heat Pump Water Heater Midstream rebate	\$1,000* *Paid directly to contractor
Measure	Rebate
Building Shell Upgrades Attic and wall insulation, air sealing, duct repair/replacement	Up to \$2,950
Heat Pump for HVAC* *Existing A/C is required to qualify for central ducted heat pump rebate	\$1,000
Bonus measures for combining building shell upgrades with a heat pump	Up to \$1,100
Smart Thermostat	\$150



### More Incentives on the Way!

#### Inflation Reduction Act

- Tax credits available now! \$2,000 for heat pumps and HPWHs
- Additional rebates coming in 2024

#### TECH Clean California

- Additional rebates for Heat Pump HVAC systems
- Coming Spring 2023

#### Self-Generation Incentive Program (SGIP)

- Additional rebates for Heat Pump Water Heaters
- Coming Summer 2023



#### Home Energy Advisor

- Free, unbiased advice for completing your Home Upgrade
- Technical and programmatic experts
- Assistance finding a Participating Contractor
- Referrals to complementary programs

(866) 878-6008 <u>advisor@bayren.org</u> <u>www.bayren.org/energy-advisor</u>

BAYREN Home<sup>+</sup>

#### **Getting Started**





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Get a Home Energy Score www.bayren.org/hes Contact an Advisor 866-878-6008 advisor@bayren.org Find a Contractor www.bayrenresidential.org/ find-a-contractor

Questions? Reach me at <u>chunter@stopwaste.org</u> or (510) 891-6567

# Questions?

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