

STAY COOL WITH HIGHER-PERFORMING AIR CONDITIONING:



Local residents share their experiences with heat pumps for space heating and cooling

August 30th, 2022 | 5:30 - 6:30 PM



Agenda

- Intro to 3C-REN
- HVAC Heat Pumps 101
- Financial Investment and Incentives
- Meet Your Neighbors
- Q&A
- Stay Engaged with Resilient Central Coast



Our Partners



Central Coast
**Community
Energy**



RECURVE
SHAPE THE FUTURE OF ENERGY



3C-REN: Tri-County Regional Energy Network

- Three counties working together to improve energy efficiency in the region
- Services for:
 - **Building Professionals:** industry events, training, and energy code compliance support
 - **Households:** support with home energy upgrades
- Funded by ratepayer dollars that 3C-REN returns to the region





ENERGY
CODE
CONNECT



BUILDING
PERFORMANCE
TRAINING



HOME
ENERGY
SAVINGS



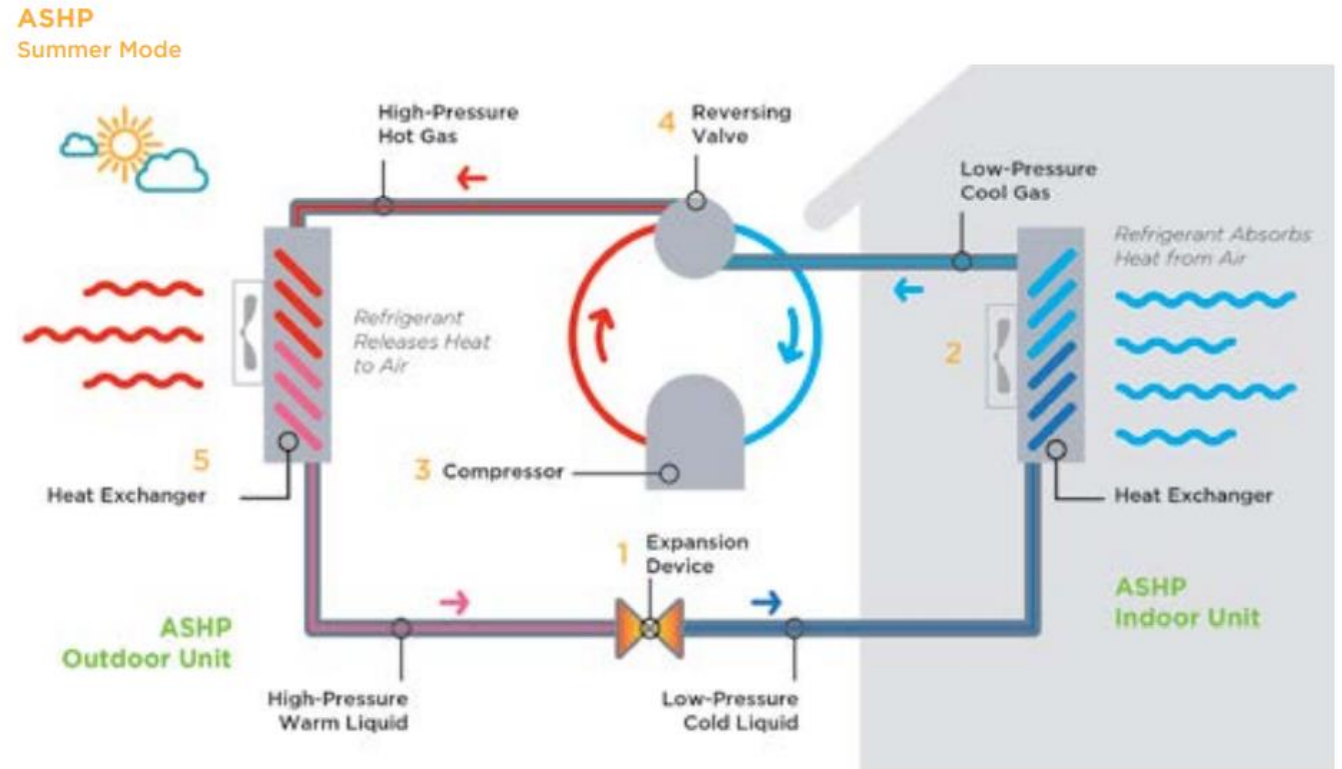


Heat Pumps 101



What Are Heat Pumps?

- Heat pumps are devices that use electricity to “pump” heat around
- Heat pumps can be used for both space heating and cooling, water heating, and refrigeration



Example: how a heat pump works in air conditioning mode



Source: Massachusetts Clean Energy Center

Benefits and Considerations of Heat Pumps

Benefits

- Higher efficiency
- Uses cleaner energy
- Built-in filtration and dehumidification
- Customizable system configurations
- Safety
- Heating and Cooling in one!

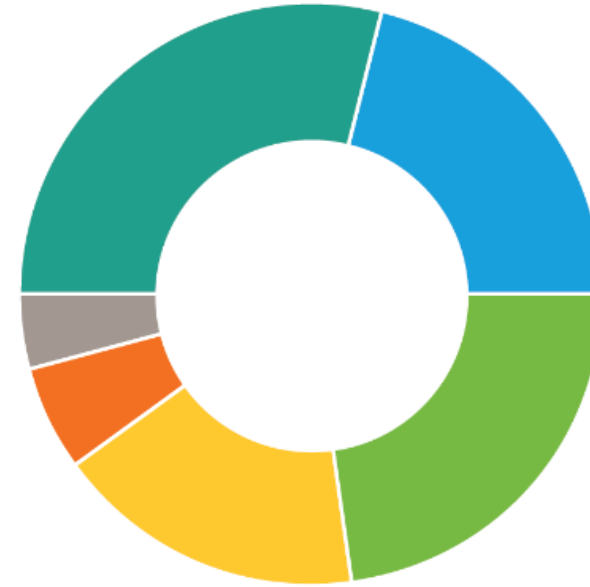
Considerations

- Cost (upfront and electricity)
- Maintenance



Total Built Environment Emissions

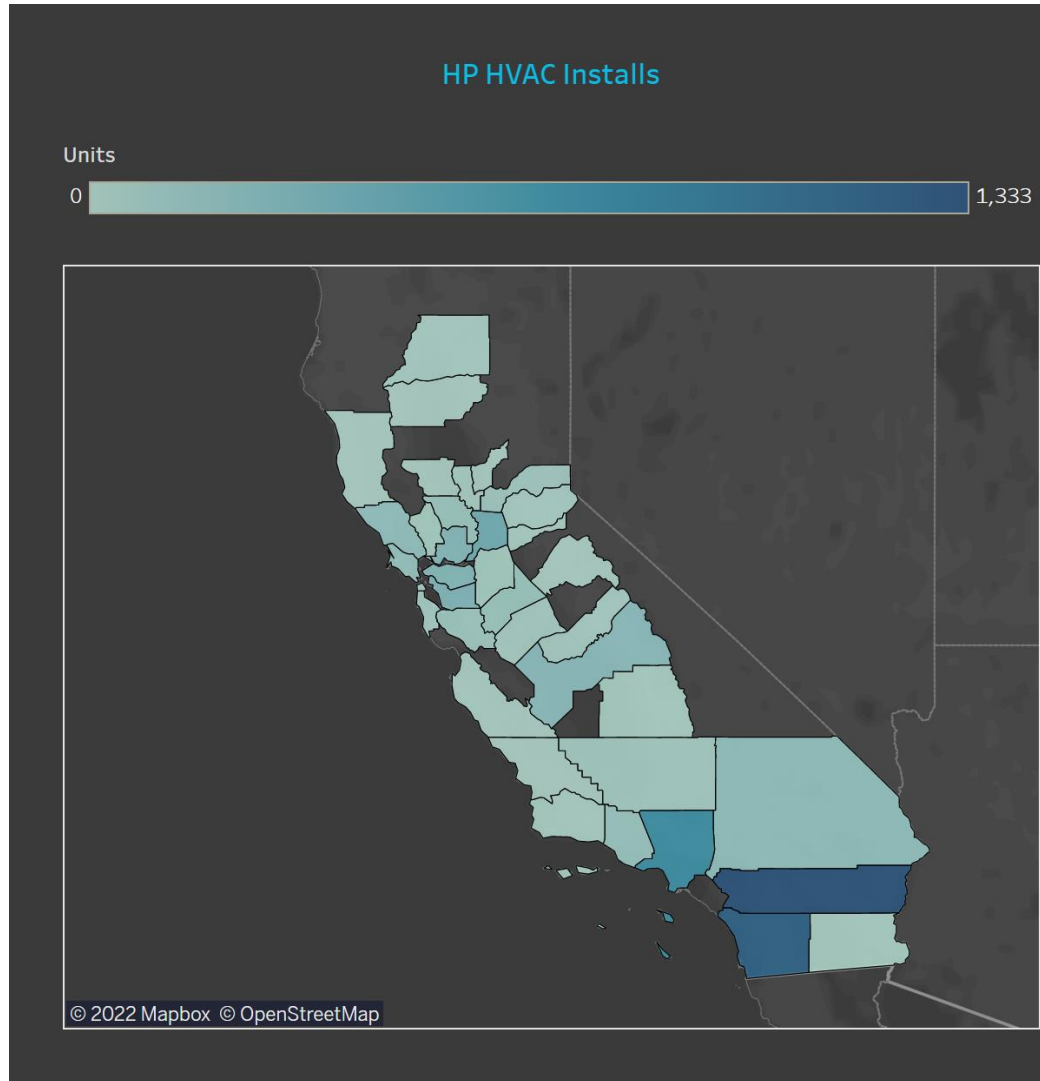
- 29% Residential Water Heating Emissions
- 21% Residential Primary Space Heating Emissions
- 23% Commercial Primary Space Heating
- 17% Commercial Water Heating Emissions
- 6% Commercial Cooking Emissions
- 4% Residential Cooking Emissions



3CE Service Area Metrics



Heat Pumps: Taking off across the state

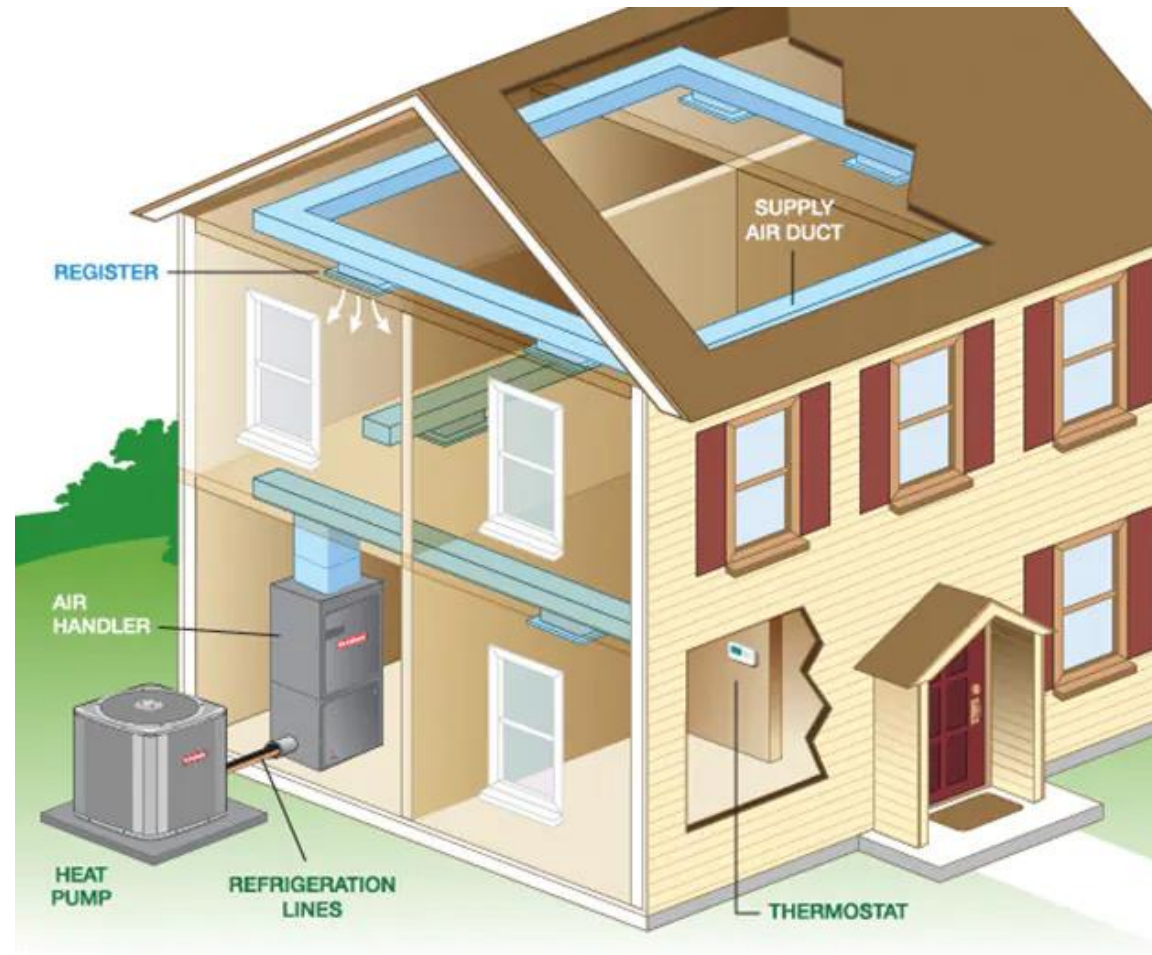


- Newsom's goal of 6 million heat pumps by 2030
- Central Coast is missing out on the movement.
- Contractors need to hear from you!



Types of Air-Source Heat Pumps for Space Conditioning

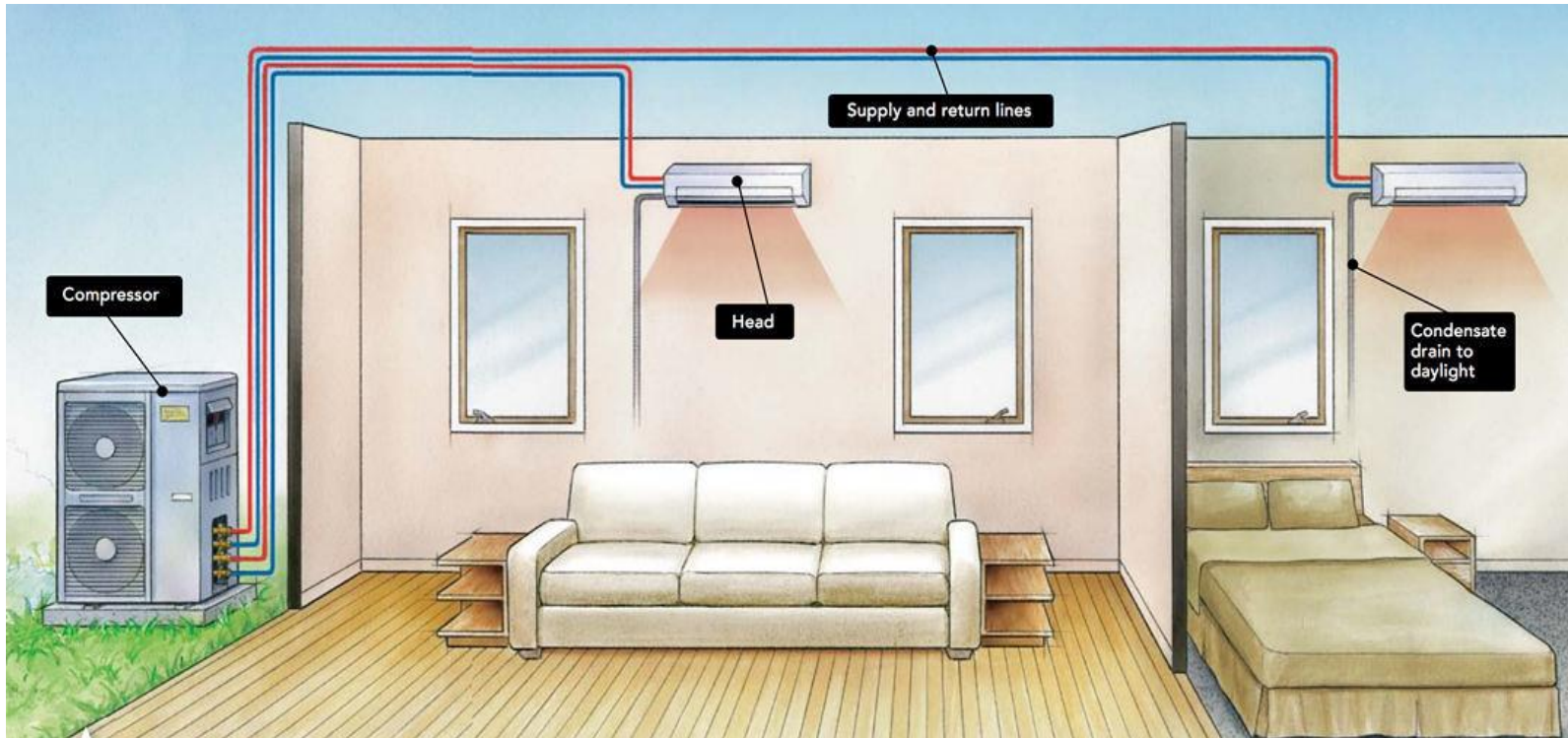
- Outdoor heat pump unit
- Air handler
- Ducts
- One temperature control



Central Heat Pump / Forced Air System



Types of Air-Source Heat Pumps for Space Conditioning



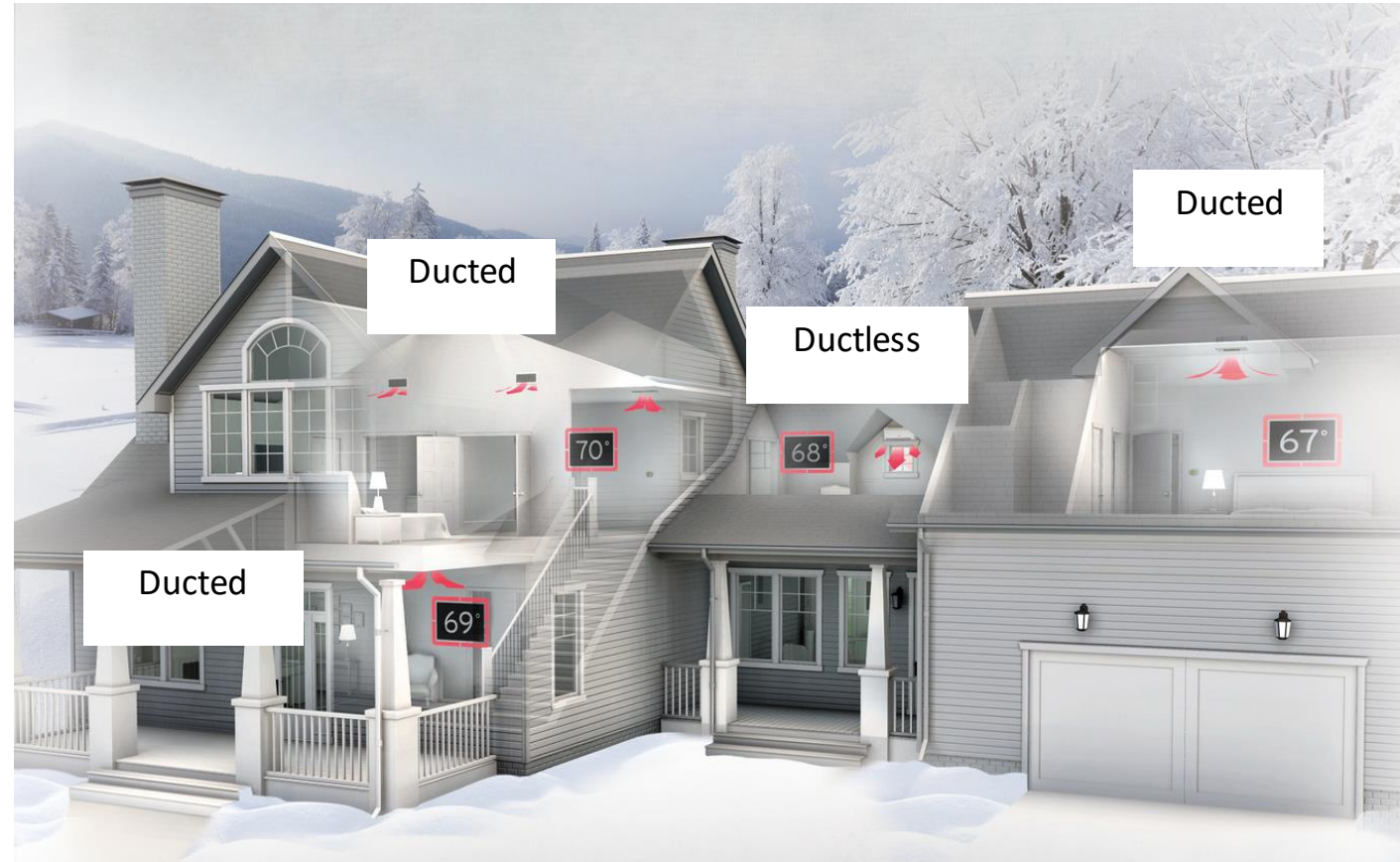
- Outdoor heat pump unit
- Indoor units
- Multiple temperature controls

Ductless Mini-Split



Types of Air-Source Heat Pumps for Space Conditioning

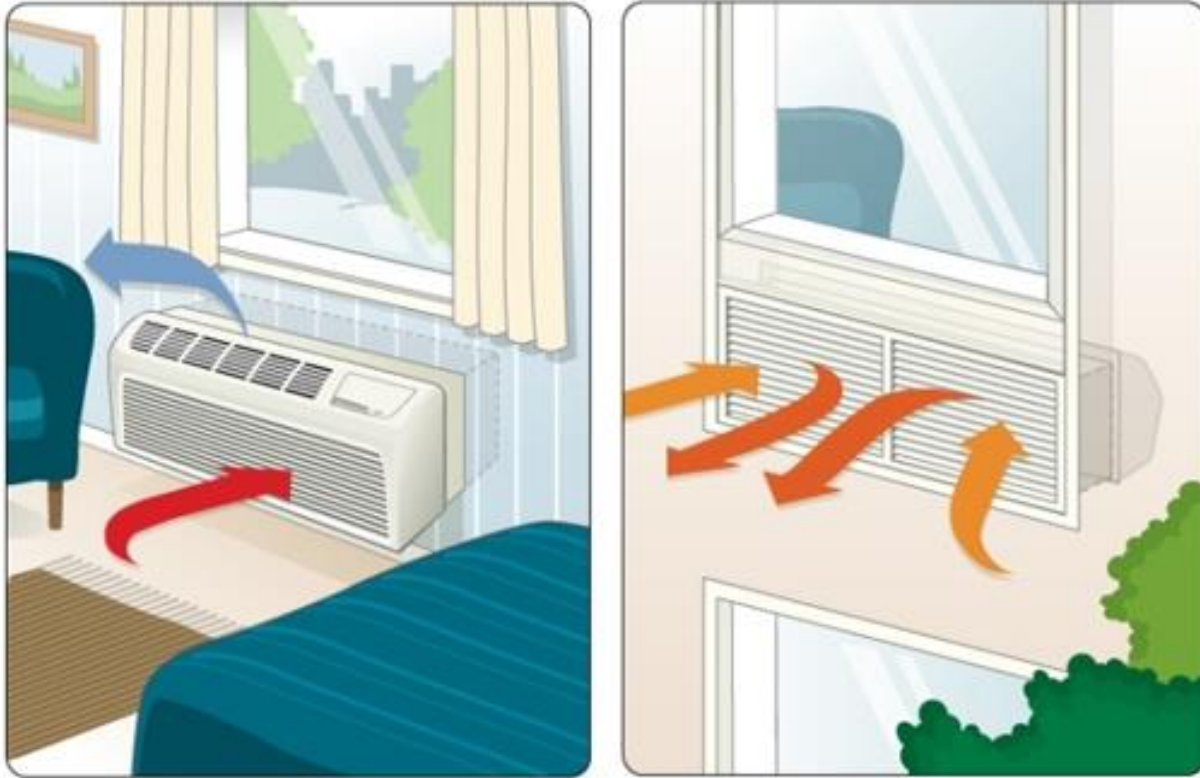
- Outdoor heat pump unit
- Air handler
- Indoor units
- Ducts
- Multiple temperature controls



Central and Ductless Hybrid



Types of Air-Source Heat Pumps for Space Conditioning



- No ducts
- No separate condenser unit

**Packaged Through-the-Wall /
Packaged Terminal Air
Conditioner (PTAC)**



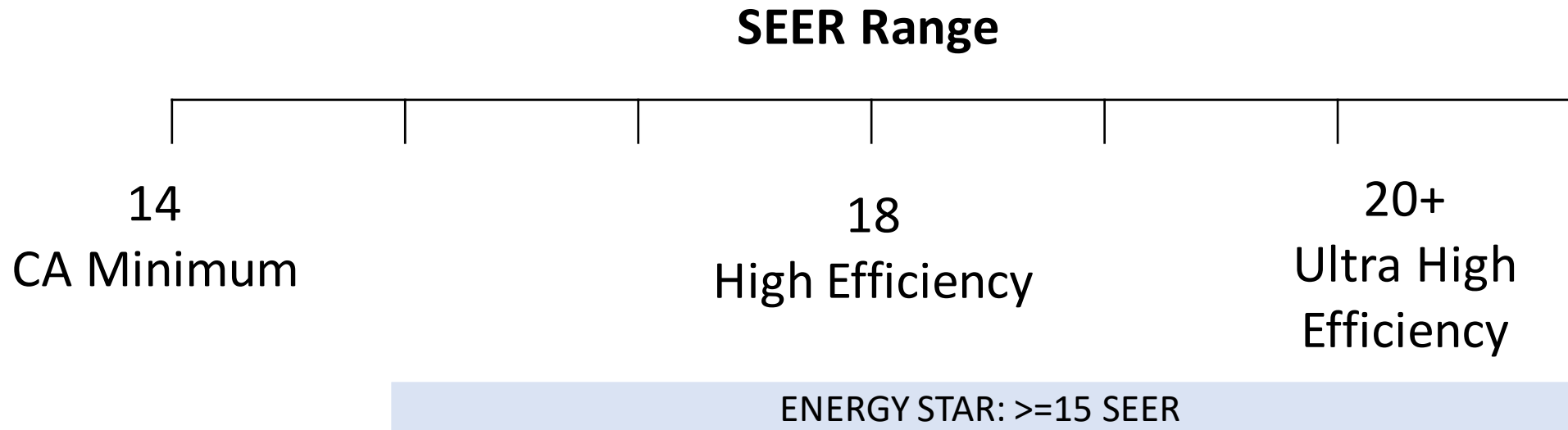
Source: ECI Comfort, Amana PTAC

SEER

Understanding heat pump efficiency ratings

SEER (Seasonal Energy Efficiency Rating)

- Efficiency of ACs or HPs in **cooling** mode

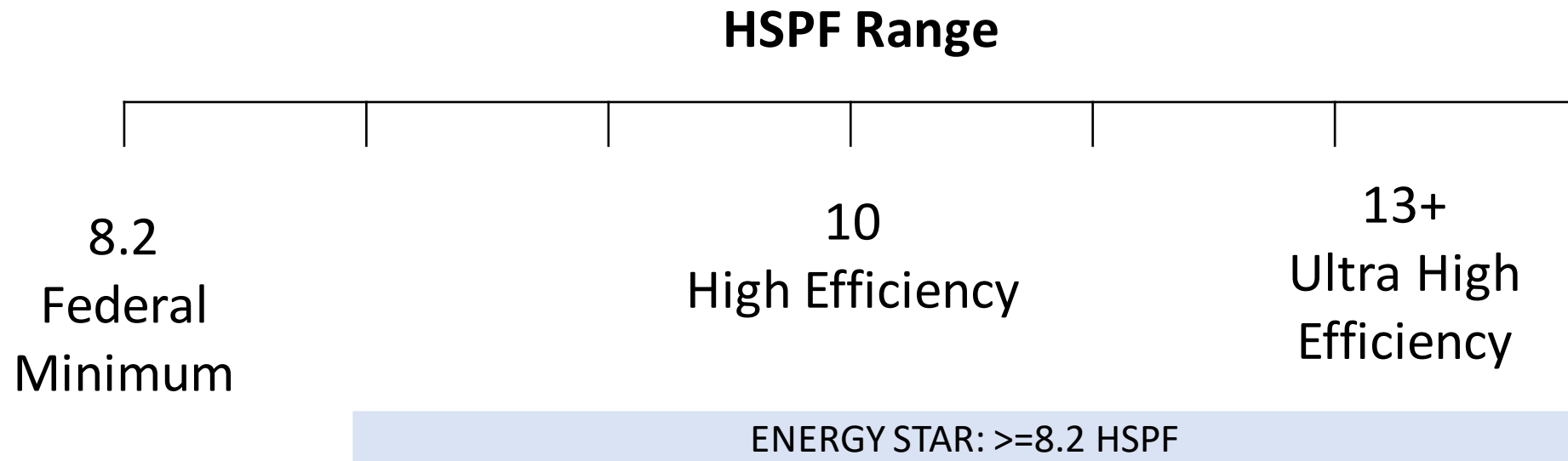


HSPF

Understanding heat pump efficiency ratings

HSPF (Heating Seasonal Performance Ratio)

- Efficiency for HPs in **heating** mode



Single, Dual and Variable Speed Systems

Single speed operate in on or off mode

Dual speed systems have two levels of “on” operation: ~70% and 100% of capacity.

Variable speed systems can be modified to operate at incremental capacities between 25% and 100%





Financial Investment and Incentives



Federal Energy Efficiency Tax Credit

Buying a Heat Pump Could Get You Thousands in Federal Tax Credits and State Rebates

The Inflation Reduction Act includes incentives for HVAC upgrades

By Liam McCabe

Updated August 15, 2022



Photo: Getty Images

The Inflation Reduction Act is packed with provisions to incentivize homeowners to make energy-efficiency upgrades to their home, including installing high-efficiency heating, cooling, and water-heating

Want More Advice About Appliances and Your Home?

Get our weekly Home newsletter

By clicking "Sign Up" I agree to the [Privacy Policy](#) and [User Agreement](#).

Sign Up 



*"This tax credit is good for **30 percent** of the total cost of what you paid for your heat pump, including the cost of labor, **up to \$2,000**; and it would be available **through the end of 2032**".*





Central Coast
**Community
Energy**

Electrify Your Home

- Up to **\$3,500** for Heat Pump HVAC equipment
- Up to **\$2,000** for electric panel upgrades/replacements
- **Additional \$1,000 per unit** for CAR/FERA qualified customers

Learn More: 3cenergy.org/electrify-your-home/





HOME
ENERGY
SAVINGS

Single Family Program

- Competitive/discounted pricing available from enrolled contractors
- Especially discounted pricing for "Hard to Reach" customers
- Quality work because contractor payments are tied to performance

Learn More: <https://www.3c-ren.org/for-residents#!/directory>



Enrolled Contractors



Bee Right There
Un"BEE"table Care For Your Heating & Air

www.callthebee.com
(805) 864-2276



BlocPower
Smart all-electric heating, cooling, and hot water systems in the 3C-REN area.

blocpower.io
(718) 924-2873



Community Action Partnership of SLO
Helping low-income homeowners buy efficient energy systems in San Luis Obispo.

capslo.org/energy-services
(805) 544-4188



Energy Pool
Pool Pump and HVAC replacements for residential homeowners in the 3C-REN area.

www.energypool.io
(213) 379-9861



Highland Air
Furnace + AC service, repair, maintenance & installation

www.highland-air.com
(805) 210-9771



Southland Heating & Air Conditioning
Heating & Air Conditioning Installation Services

<https://southlandac.com>
(805) 422-7754



Temp Air System
High-Efficiency HVAC System provider for homeowners in 3C-REN area.

www.tempairsystem.com
(626) 333-3409



TriCounty Services
HVAC, Indoor Air, Fireplace & Plumbing in Ventura & Santa Barbara Counties

www.tri-county-aire.com
(805) 500-2944



Water Fixers
Expert Plumbing Services & Water Filtration Services for the Central Coast

<https://waterfixers.com/>
(805) 928-6444



Financial Impact

Get started
Current heating & cooling

HVAC technicians and more advanced users can customize assumptions here, such as values for equipment efficiency and energy price growth rates to get more precise results.

Customize the current system efficiency levels

Current space heating: Central heating with gas furnace and air ducts

Heating efficiency: AFUE [80]

Current space cooling: No cooling device

Cooling efficiency: SEER [Null]

Current water heater: Gas storage water heater

Water heater efficiency: UEF [0.63]

Customize the heat pump efficiency levels

Space conditioning heat pump: Central/ducted systems

Heat pump heating efficiency: HSPF [10.6]

Heat pump cooling efficiency: SEER [19]

Heat pump water heater efficiency: COP [3]

Customize the energy price escalation rates

Electricity price escalation rate: (%/year)

Gas price escalation rate: (%/year)

Has a contractor given you a quote for installation costs? If so, we can use this value to calculate your payback time and overall benefits.

Installation costs before incentives: (\$)

Note: Changes made on this dashboard are reflected in other dashboards' results.

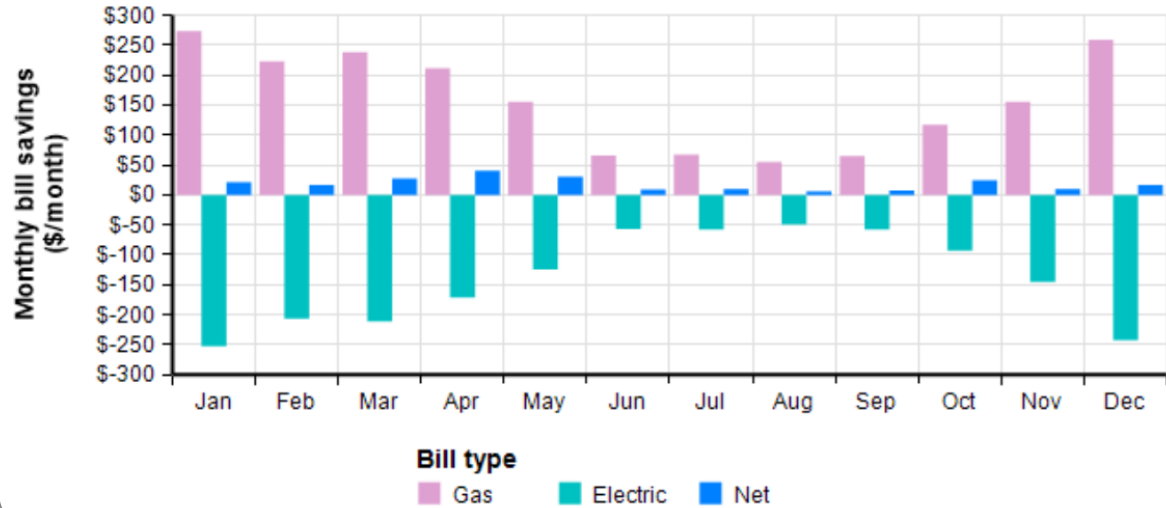
pump options

Advanced options

About

First-year bill savings	(\$/year)	\$222
Change in natural gas use	(therms/year)	-820
Change in electricity use	(kWh/year)	+5,359
Lifetime CO2 savings	62 tonnes CO2 = 2,324 trees planted	

Monthly bill savings (\$/month)



Source: heatpumpevaluation.com/heatpumpcalculator



Meet Your Neighbors



Guest Speakers

Mike

Santa Barbara, Santa Barbara County

Laurie

Vandenburg Village, Santa Barbara County

LeNan

San Luis Obispo, San Luis Obispo County

Andy

Santa Margarita, San Luis Obispo County

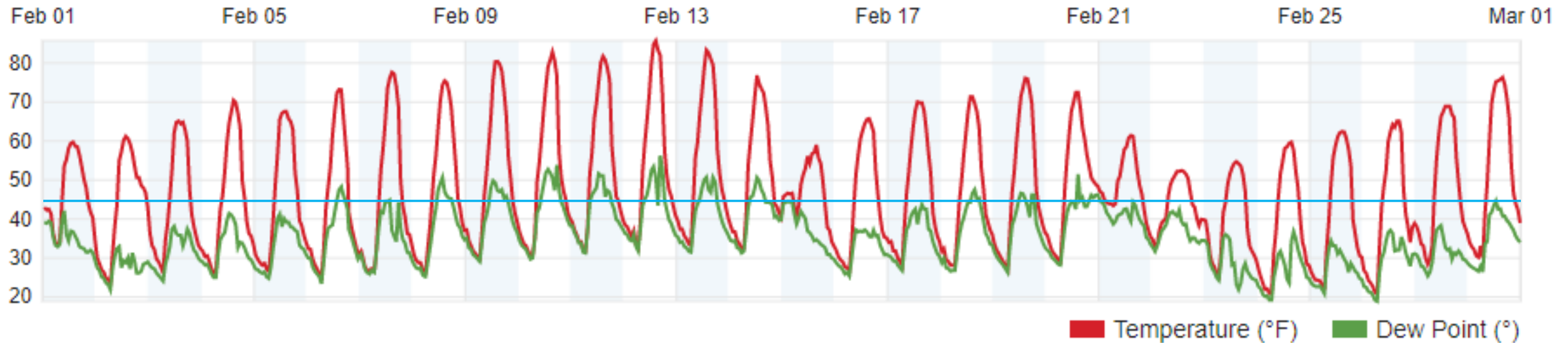




Winter Temps below 45° F? Choose a Modern Hyper Heat Style Heat Pump

Andy Mutziger
Santa Margarita, CA 93453

February 1, 2022 - February 28, 2022



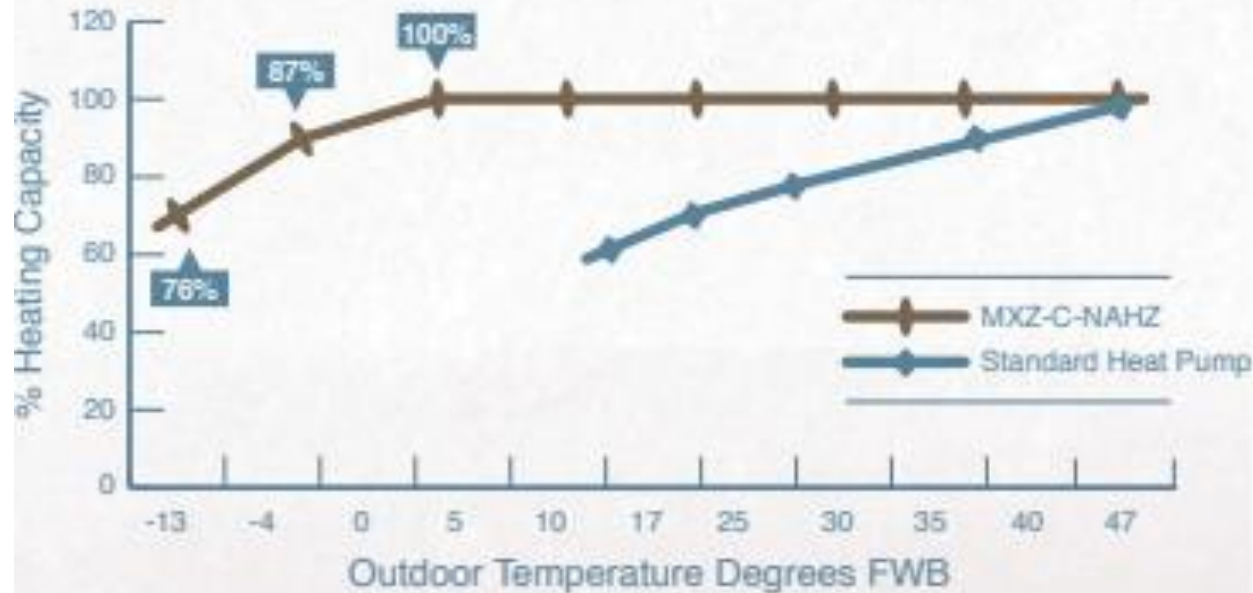
Weather History for KCASANTA2534

<https://www.wunderground.com/dashboard/pws/KCASANTA2534/graph/2022-02-28/2022-02-28/monthly>

H2i® TECHNOLOGY



MXZ H2i HEATING CAPACITY AT LOW TEMPERATURES*



* Includes correction for defrost.

HEATING even when it's minus 13 degrees F outdoor ambient, producing up to 100% heating capacity at 5 degrees F.

YEAR-ROUND COMFORT in extreme climates without the need for energy-consuming indoor supplemental heating devices.

HOT-START TECHNOLOGY provides warmth from the start, reducing drafts.

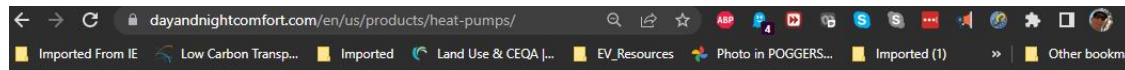
MINIMAL MAINTENANCE thanks to easily accessible filters, little or no ductwork to clean, and simple wiring between the indoor and outdoor units.

Standard heat pumps have to make up for their efficiency loss at low temps by running energy hungry heat strips.

Hyper Heat uses INVERTER-driven compressor technology. As outside temps drop, the variable speed compressor motor ramps up as needed with the systems funneling the additional heat thrown off the compressor magnets into the 3-speed air handler to quickly super-charging your heat output and then ramps down to maintain set point.

Replaced 20yr old Natural Gas Heater & AC - May 2021


Mistake: Purchased Standard Heat Pump that Needs to Augment Heat below 45° w/ Electric Heat Strips



Ion™ System Heat Pumps

Our premium line of heat pumps can deliver high-efficiency electric cooling and heating as well as enhanced summer dehumidification. Combine these heat pumps with the Ion™ System Control and an Ion Series indoor unit for our ultimate home comfort experience.


Compare



CVH8 >

Ion™ 18 Variable-Speed Heat Pump

Experience the smooth, quiet superior comfort of our most advanced heat pump. This smart, variable-speed system matches the smallest changes in conditions to ensure comfort and savings.




Cooling Efficiency **Up to 19 SEER**

Heating Efficiency **Up to 11 HSPF**

Sound **As low as 56 decibels**


Compare



CCH6 >

Ion™ 16 Two-Stage Heat Pump

By operating mostly in low stage, this unit gives you efficient operation that's quiet. Matched with an Ion System Control, you can enjoy dual fuel capability and the convenience of remote access.




Cooling Efficiency **Up to 17.5 SEER**

Heating Efficiency **Up to 9.5 HSPF**

Sound **As low as 68 decibels**
35,200 BTU Cooling
22,400 BTU Heating


Compare



CSH6 >

Ion™ 16 Heat Pump

This high-efficiency heat pump can be used with a fan coil or paired it with a compatible furnace and control for dual fuel heat savings.



Cooling Efficiency **Up to 16.0 SEER**

Heating Efficiency **Up to 9 HSPF**

Sound **As low as 68 decibels**

\$18,220

5-Stage CVH837GKA Heat Pump
+ FCM4X3600AL Air Handler

\$13,800

2-Stage CCH624GKA Heat Pump
+ FVM4x3600BL Air Handler

<https://www.dayandnightcomfort.com/en/us/products/heat-pumps/>

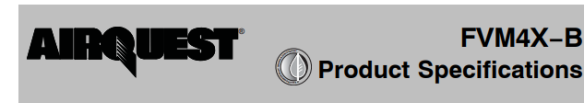
ELECTRIC HEATERS		
Part Number	Description	Use with Model Sizes
EHK05AKN	5 kW, single phase, no internal circuit protection	ALL
EHK05AKB	5 kW, single phase, with circuit breakers	ALL
EHK07AKN	8 kW, single phase, no internal circuit protection	ALL
EHK07AKB	8 kW, single phase, with circuit breakers	ALL
EHK09AKCN	9 kW, supplied as single phase, field convertible to 3-phase, no internal circuit protection	3600B, 4800B, 6000B
EHK10AKN	10 kW, single phase, no internal circuit protection	ALL
EHK10AKB	10 kW, single phase, with circuit breakers	ALL
EHK15AKF	15 kW, single phase, with fuses	ALL
EHK15AKB	15 kW, single phase, with circuit breakers	ALL†
EHK15AHN	15 kW, 3-phase, no internal circuit protection	ALL†
EHK18AHN	18 kW, 3-phase, no internal circuit protection	4800B, 6000B
EHK20AKF	20 kW, single phase, with fuses	ALL†
EHK20AKB	20 kW, single phase, with circuit breakers	ALL†
EHK25AHCF	24 kW, supplied as 3-phase, field convertible to single phase, with fuses	4800B, 6000B
EHK30AHCF	30 kW, supplied as 3-phase, field convertible to single phase, with fuses	4800B, 6000B



† 15kW & 20kW are not recommended for specific heat pump applications, see AIRFLOW DELIVERY (CFM)

Before project our
 10 X 360 w Solar Panels
 160% Energy Needs

1yr after project
 Stnd Heat Pump w/ Heat Strips
 exceeded our excess solar capacity



VARIABLE SPEED FAN COILS

ALL MODELS

- 2, 3, 4, and 5 Tons
- Supports two-stage outdoor units
- Available for Environmentally Sound R-410A systems
- Bolt-on, hard shut-off TXV metering device factory installed on all models
- Sweat connections
- Primary and secondary drain fittings with brass inserts
- Time delay relay (TDR)
- Field installed heater packages from 5 kW - 30 kW available separately
- HUD approved for manufactured housing
- 208/230-1-60 supply voltage
- Multiposition installation - upflow or horizontal left standard, horizontal right with minor modification (field convertible to downflow with accessory kits)
- Filter (washable) factory supplied
- Heat staging option
- Dehumidification function with standardized logic (same as furnaces and SPP)
- 1 inch (25mm) thick insulation with R value of 4.2

PERFORMANCE

- Variable speed ECM motor on all models
- Adjustable cooling and heating ON/OFF delay
- Heat Pump Comfort option to provide higher than normal heating air delivery temperature
- Units tested and certified by manufacturer to achieve a 2% or less leakage rate at 1.0 inch water column

EASY TO INSTALL AND SERVICE

- Multiple electrical entry locations
- TXV and manifold positioned to the side for easier clearing
- Zero clearance without heaters

WARRANTY*

- 10 year No Hassle replacement limited warranty
- 5 year parts limited warranty
- With timely registration, an additional 5 year parts limited warranty
- * For owner occupied residential applications only. See warranty certificate for complete details and restrictions, including warranty coverage for other applications.



Model Number	Tons	Nominal BTU	CFM (L/s) Range		Dimensions H x W x D in. (mm)	Filter Size in. (mm)	Ship Wt. lbs. (kg)
			Low	High			
FVM4X2400B**	2	24,000	350 (105)	1200 (566)	42-11/16 x 17-5/8 x 22-1/16 (1084 x 448 x 560)	16-3/8 x 21-1/2 (416 x 546)	135 (61)
FVM4X3600B**	3	36,000	415 (196)	1400 (661)	53-7/16 x 21-7/8 x 22-1/16 (1357 x 537 x 560)	19-7/8 x 21-1/2 (505 x 546)	150 (68)
FVM4X4800B**	4	48,000	425 (201)	1600 (755)	53-7/16 x 21-7/8 x 22-1/16 (1357 x 537 x 560)	19-7/8 x 21-1/2 (505 x 546)	172 (78)

<https://www.bakerdist.com/airquest-fvm4x3600bl-3-ton-multi-position-variable-speed-txv-air-handler-r410a-a47a4f6>
https://cdn.bakerdist.com/airquest-fvm4x3600bl_article_13019645216456566_en_ss.pdf

Option 1

Mitsubishi Electric SUZ-KA36NA2 Heat Pump

- 37,315 BTUs Cooling
- 23,697 BTUs Heating
- 16 SEER, 8.8 EER, 11.7 HSPF
- 12 Year Parts Warranty
- 1 Year Labor Warranty
- 7 Year Compressor Warranty

Indoor Unit Selections

Attic

- Multi-Position Ducted
- SVZ-KP36NA
- 35,660 BTUs Cooling
- 23,697 BTUs Heating

Equipment Subtotal \$10,838

Accessories

- Mitsubishi Electric Control Interface Device - Thermostat Interface (PAC-US444CN-1) **\$239**

Subtotal \$239

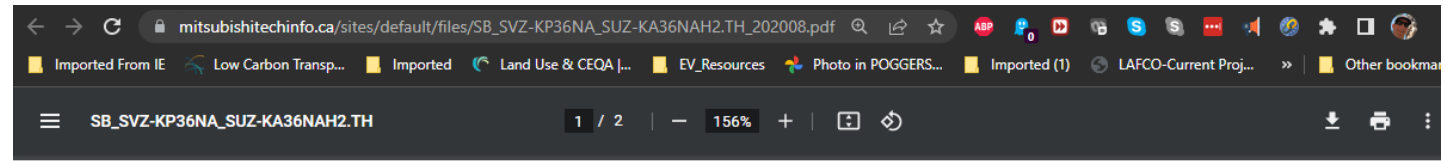
Install Materials

- ✓ Lineset, qty: 1
- ✓ New Drain Pan, qty: 1

Option 1 Total Investment

Total: \$11,077
Payment: Cash

February 16, 2021 2:42:48 PM

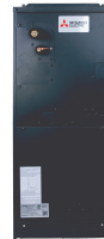


Heating and Cooling

M-SERIES

SUBMITTAL DATA: SVZ-KP36NA & SUZ-KA36NAH2 36,000 BTU/H MULTI-POSITION AIR HANDLER HEAT PUMP SYSTEM

Job Name:	Location:	Date:
Purchaser:	Engineer:	
Submitted to:	For <input type="checkbox"/> Reference <input type="checkbox"/> Approval <input type="checkbox"/> Construction	
System Designation:	Schedule No.:	



ACCESSORIES:

- Windscreen (ME-FR-24)
- Electric Heater Kit (See_SB_EH_MVZ_PVA_PVFY_SVZ)

Optional Controls

Cooling	Rated Capacity	Btu/h	33400
	Capacity Range	Btu/h	11600-33000
	Total input	W	3711
	Energy Efficiency	EER	9.0
		SEER	16
	Moisture Removal	Pints/h	4.7
Sensible Heat Factor		0.84	
Heating at 47°F	Rated Capacity	Btu/h	33500
	Capacity Range	Btu/h	13260-36000
	Total input	W	3030
	HSPF (Region IV)	Btu/h/W	11.7(11.6)
Heating at 17°F	Rated Capacity	Btu/h	23200
	Rated Total input	W	2710(2830)
	Maximum Capacity	Btu/h	23200
	Maximum Total Input	W	2710(2830)
Power supply	Voltage, Phase, Cycle		208/230V, 1-phase, 60Hz
	Indoor - Outdoor S1-S2		AC 208/230V
Voltage	Indoor - Outdoor S2-S3		DC12-24V
	Indoor - Remote controller		DC12V
MCA (*)	A		4.13
Fan Motor	F.L.A		3.3

https://www.mitsubishitechinfo.ca/sites/default/files/SB_SVZ-KP36NA_SUZ-KA36NAH2.TH_202008.pdf

Had I gone w/ a Hyper Heat quote: \$2,700 less expensive + the inverter driven compressor is way less power hungry than our system's heat strips; Would still have some excess solar capacity to replace our natural gas stove or water heater.

Questions??





**RESILIENT
CENTRAL
COAST**

**EVERYDAY
OPPORTUNITIES
FOR LOCAL
CLIMATE ACTION**

- ☰
- 🏠
- 🔄
- 🏠
- 👥
- 📅
- 📍
- ★
- 🔔
- 📍
- ⚙️
- 🔒
- 👤



Emily's Santa Cruz House

Welcome to your dashboard! It's easy to get started. Just 3 simple steps:

- COMPLETE YOUR PROFILE
- CHOOSE ACTIONS
- INVITE YOUR FRIENDS/COMMUNITY

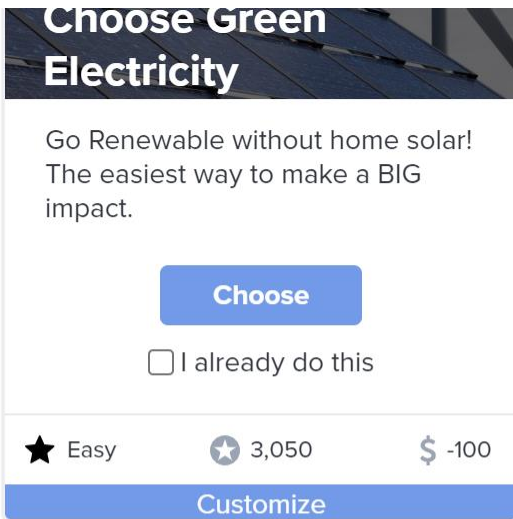
- MY TEAM
[Join or Start a Team](#)
- MY COMMUNITY GROUP
[Join or Create a Community Group](#)
- MY CITY
Santa Cruz

My Progress

My posts

All Most recent ▾

Share & Celebrate! Post from Action pages, Team or Group pages or when you complete an action.



Choose Green Electricity

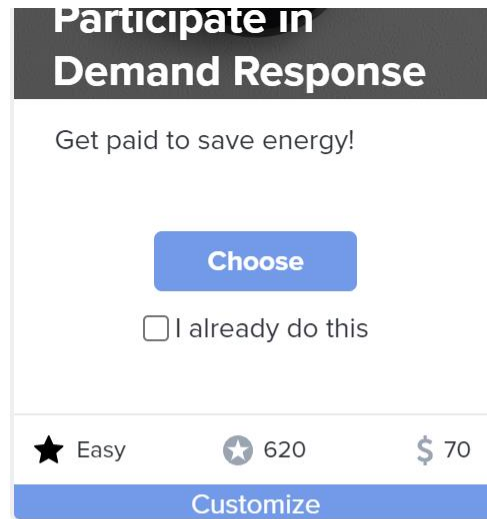
Go Renewable without home solar!
The easiest way to make a BIG impact.

Choose

I already do this

★ Easy ⭐ 3,050 \$ -100

Customize



Participate in Demand Response

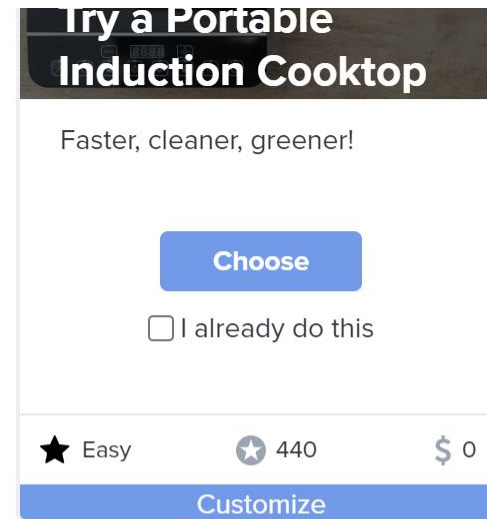
Get paid to save energy!

Choose

I already do this

★ Easy ⭐ 620 \$ 70

Customize



Try a Portable Induction Cooktop

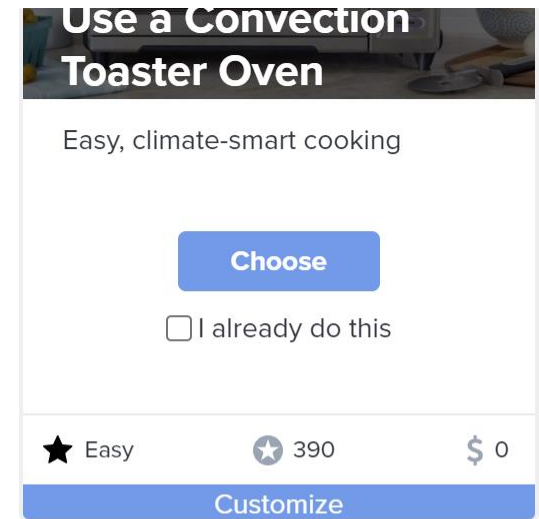
Faster, cleaner, greener!

Choose

I already do this

★ Easy ⭐ 440 \$ 0

Customize



Use a Convection Toaster Oven

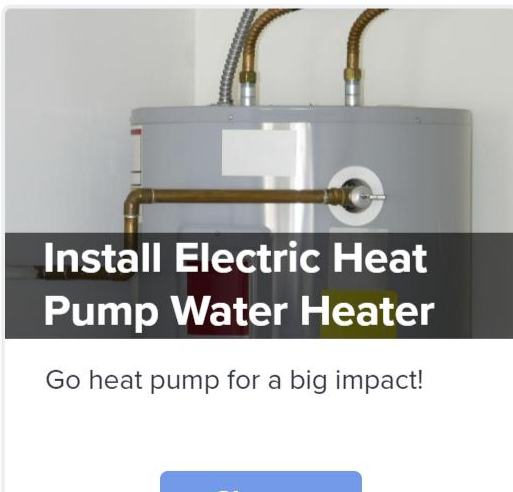
Easy, climate-smart cooking

Choose

I already do this

★ Easy ⭐ 390 \$ 0

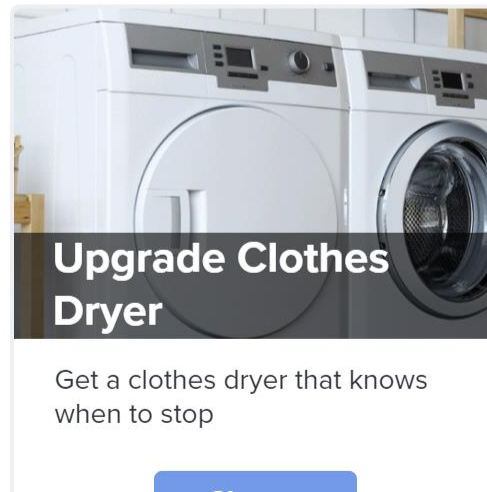
Customize



Install Electric Heat Pump Water Heater

Go heat pump for a big impact!

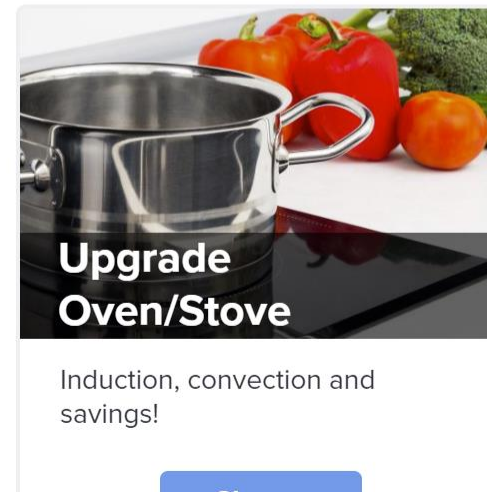
Choose



Upgrade Clothes Dryer

Get a clothes dryer that knows when to stop

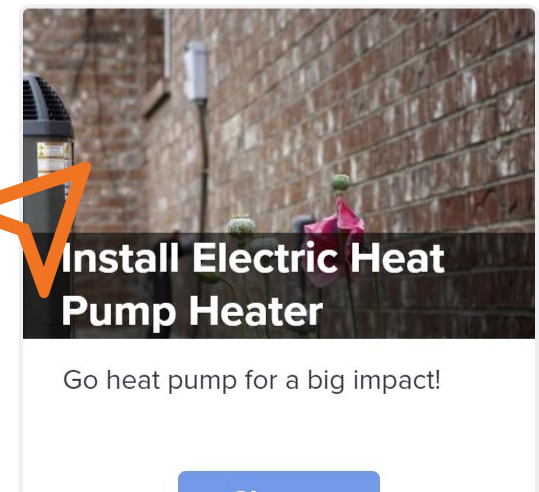
Choose



Upgrade Oven/Stove

Induction, convection and savings!

Choose



Install Electric Heat Pump Heater

Go heat pump for a big impact!

Choose



Install Electric Heat Pump Heater

If it's time to upgrade your home heating system, go with a highly efficient electric air sourced heat pump heating system. Regardless of what type of heating system you have now, this is the best option for low-cost energy and lowering your impact on the climate.

[VIEW DISCUSSION](#)

[+ CREATE POST](#)

Your Impact **5320 points** ?

[SHARE](#)

UPFRONT COST

\$3000 - \$6000 \$\$\$\$

TIME COMMITMENT

4.0 hours ⌚⌚⌚⌚

RESOURCE SAVINGS

310 Therms Natural Gas 🔥🔥🔥🔥

ANNUAL SAVINGS

\$-70 💰💰💰💰

Resources

PROGRAMS

Central Coast Community Energy - Electrify Your Home Program

Electrify Your Home is a CCCE partnership with TECH Clean California. This partnership provides cash incentives to contractors for qualifying heat pump projects in the CCCE service area. Cash incentives are available when switching gas-powered water heaters and HVAC equipment to all-electric versions. Incentives are available to help cover appliance costs and costs related to electric panel upgrades or replacement.

Visit <https://3cenergy.org/electrify-your-home/> to learn more!

PROGRAMS

Find a Clean Energy Contractor!

Connect Directly to Trusted Contractors Doing Clean Energy Projects

INFORMATION

The Switch Is On!

Clean Electric Appliances and Home Electrification





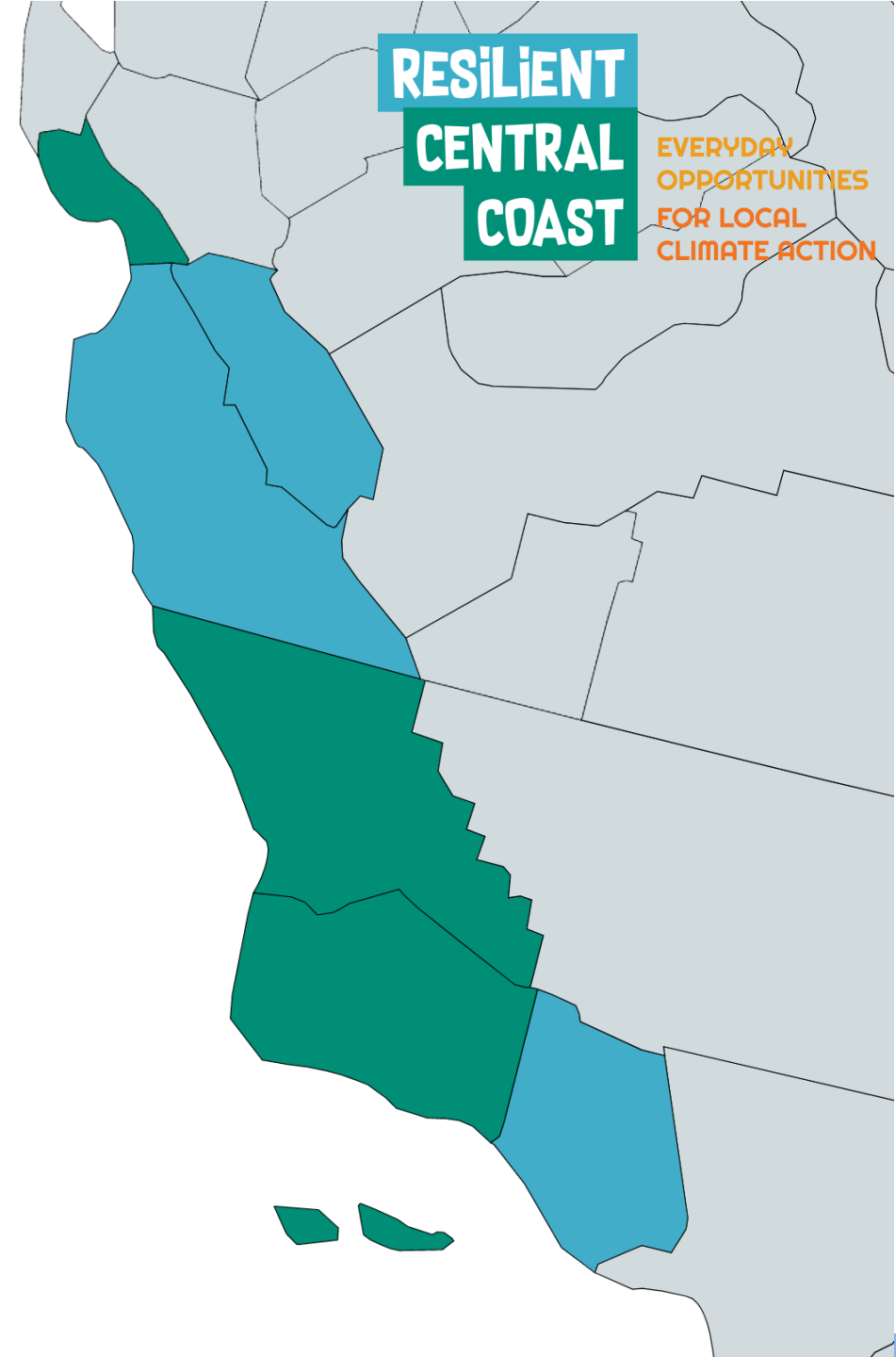
Santa Cruz County:
resilientsantacruzcounty.org



San Luis Obispo County:
resilientSLO.org



Santa Barbara County:
climateresilientSBC.org



Next Steps

Learn More:

- Resilient Central Coast Platform
- [The Switch Is On](#)

Connect with a Contractor:

- [3C-REN Single Family Program](#)
- [CCCE Electrify Your Home Program](#)





Thank you!

For more info:
3c-ren.org

For questions:
info@3c-ren.org



TRI-COUNTY REGIONAL ENERGY NETWORK
SAN LUIS OBISPO • SANTA BARBARA • VENTURA

Heat Pump Installation Checklist

Use the Department of Energy checklist when working with contractors to ensure quality installation

Preparation

- ✓ Inspect, repair, and assess **ducts**
- ✓ Conduct **load calculation**
- ✓ Select **ENERGY STAR** appliance

Installation

- ✓ Install **heat pump** per ANSI/ACCA specifications
- ✓ Replace **air filter** properly
- ✓ Optimally locate **thermostat**

Commissioning

- ✓ Verify **refrigerant charge**
- ✓ Verify and ensure appropriate ventilation and **air flow**



Download the [PNNL: Heat Pump Installation and Replacement Checklist](#)