A Future without Gas

Electrifying your multifamily building

SAN FRANCISCO
ENVIRONMENT
DEPARTMENT

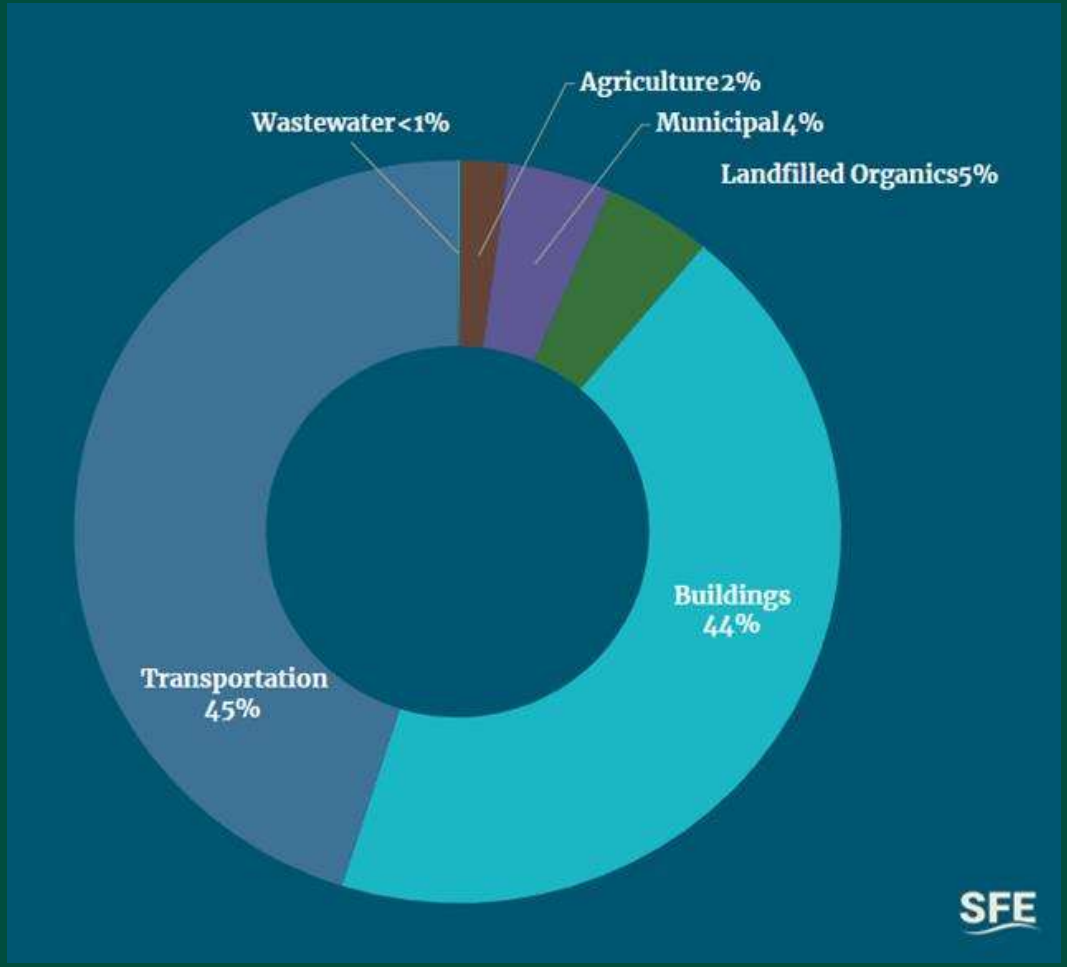
ELECTRIFICATION

1. Why we need it
2. Why you want it
3. Common concerns
4. How to do it

SFE

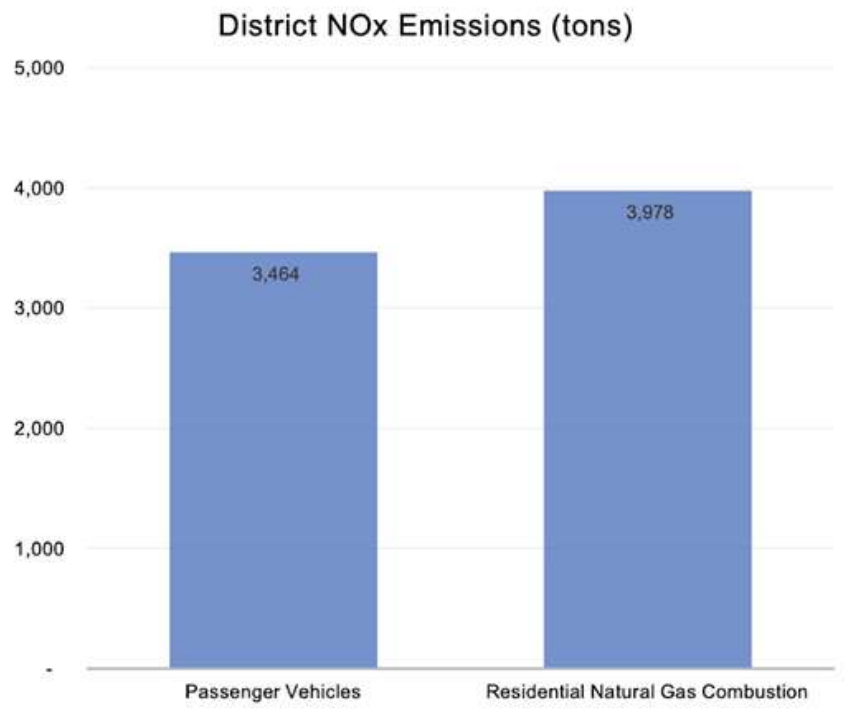
We Have to Address Buildings

The majority of SF **climate emissions** come from natural gas used in **buildings** and fuel used in **cars & trucks**



SF NOx Emissions

Gas equipment produces more NOx than cars



Building Appliance Rules Workshop
October 7, 2021

Bay Area Air Quality

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

CALIFORNIA AIR RESOURCES BOARD

SEAL OF THE CITY AND COUNTY OF SAN FRANCISCO

2025: Major Renovations
2026: Lawn Equipment
2027: Residential Water Heaters
2029: Residential Furnaces
2031: Commercial Water Heaters
2035: Zero Emission Vehicles

Zero Emissions Regulations

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Benefits of Electrification

Why Electrify? | *Better Performance*

Induction stoves are faster, safer & cleaner than gas stoves

EVs are smoother, quicker, and quieter than gas vehicles

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Why Electrify? | *Improved Health & Safety*

Gas appliances produce more air pollution than cars!

Indoor air pollution from gas stoves = second-hand smoke

Electric stoves reduce risk of gas explosions

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Why Electrify? | *Comfort & Reliability*

Modern heat pumps can heat AND cool your home

Electricity gets restored faster than gas

EV's could soon backup your home & balance the grid

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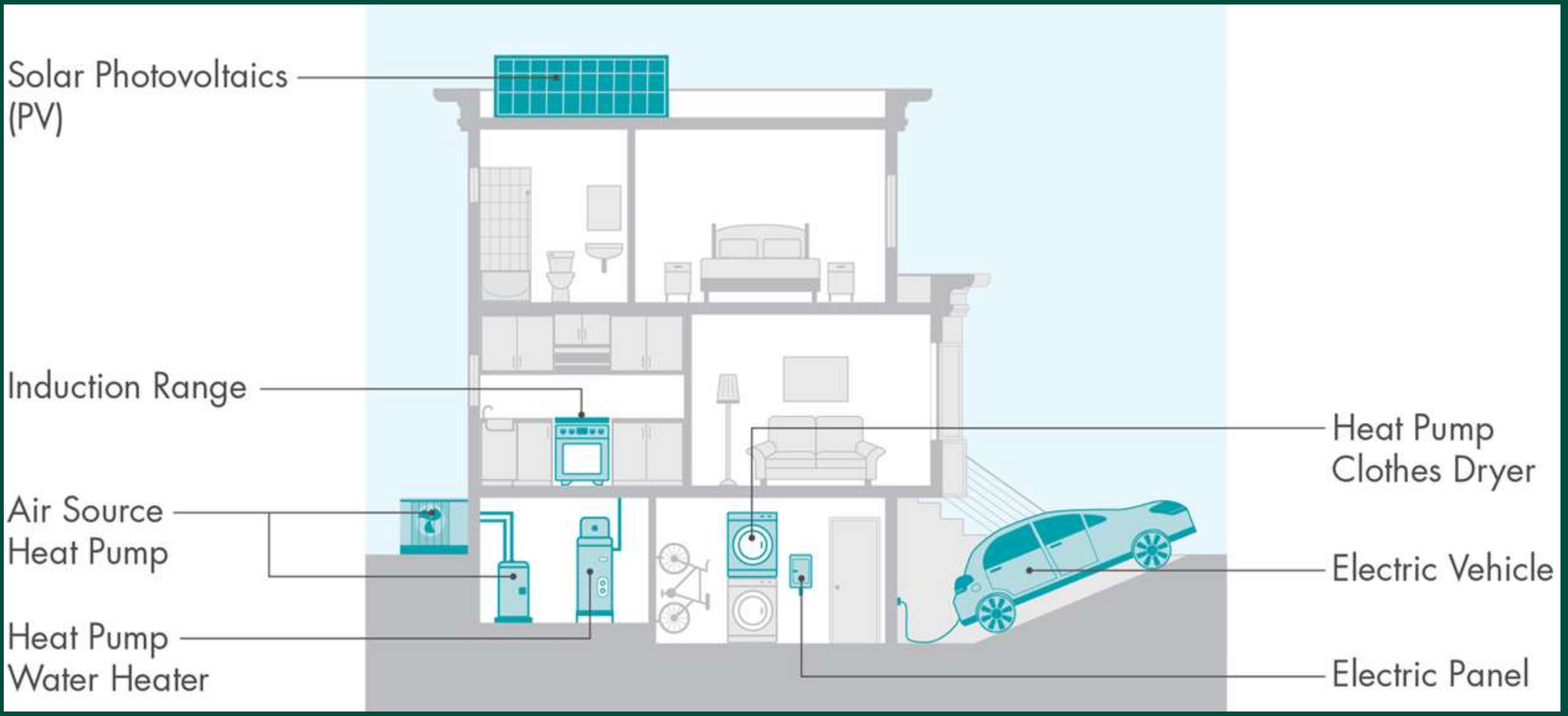
Why Electrify? | *Cost Savings*

Efficiency of heat pumps compensates for high rates

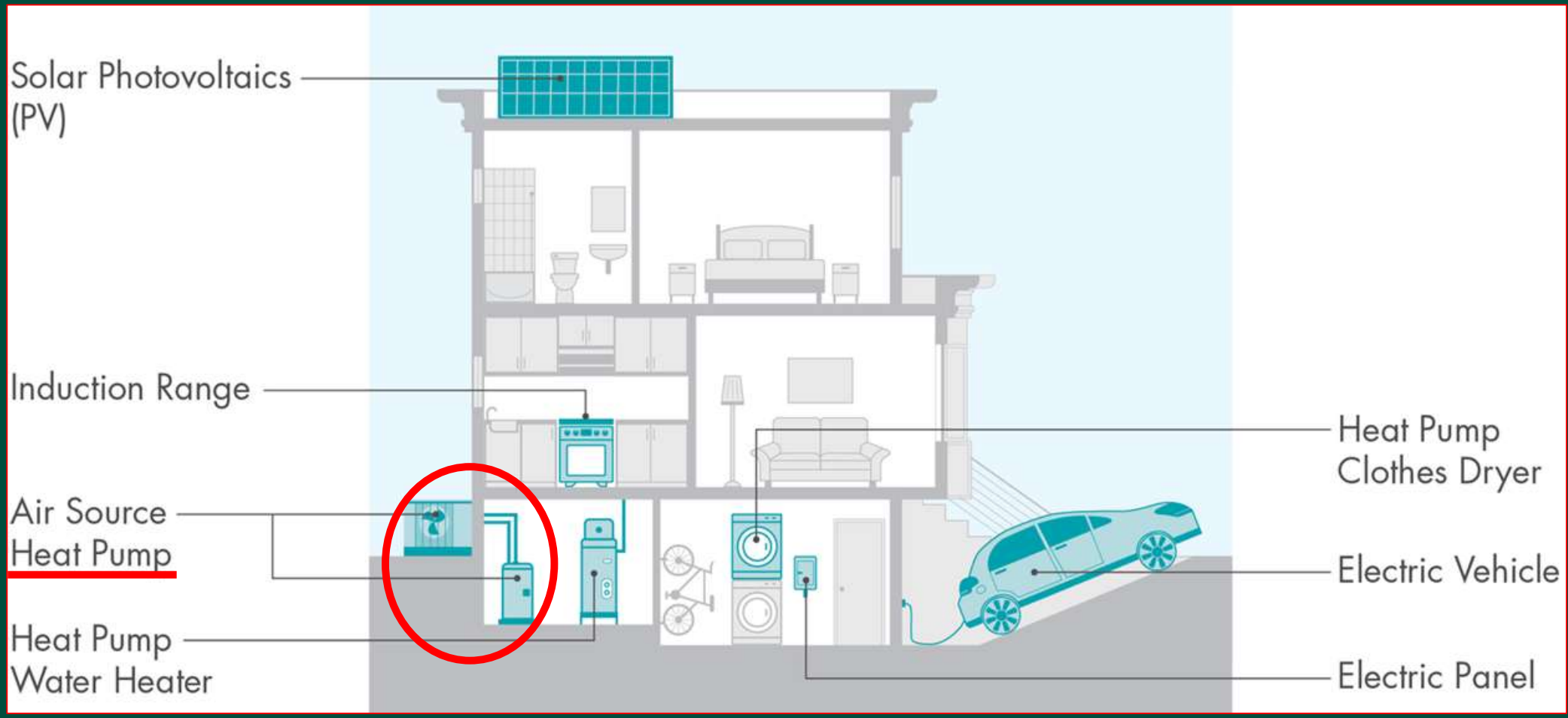
Solar panels + incentives help reduce your electric bill

Making the Switch

Components of an All-Electric Home



Heat Pump


Solar Photovoltaics (PV)
Induction Range
Air Source Heat Pump
Heat Pump Water Heater
Heat Pump Clothes Dryer
Electric Vehicle
Electric Panel

What is a Heat Pump?

Heat pumps *transfer* heat rather than generating it

Did someone say air conditioning in San Francisco???

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Many Shapes & Sizes

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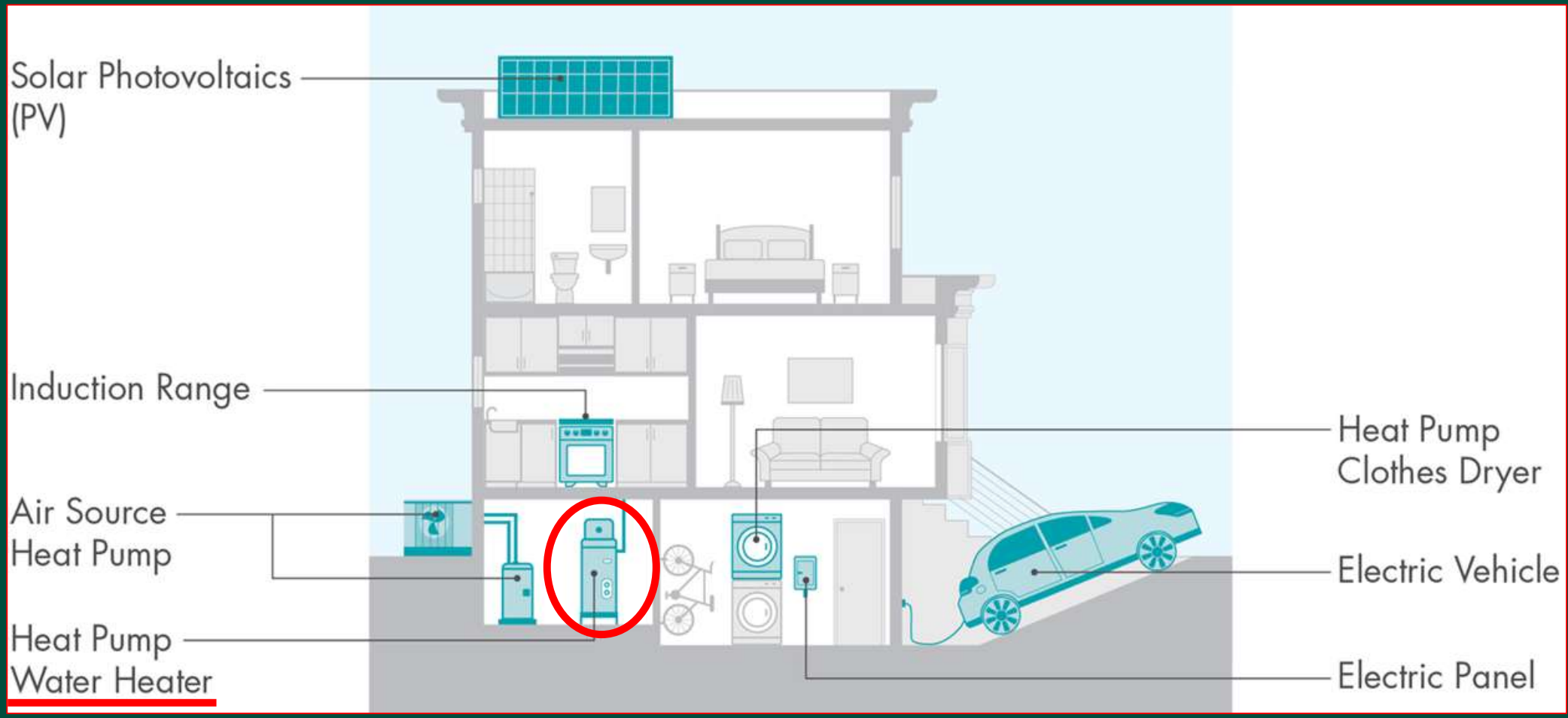
Heat Pump Water Heater (HPWH)



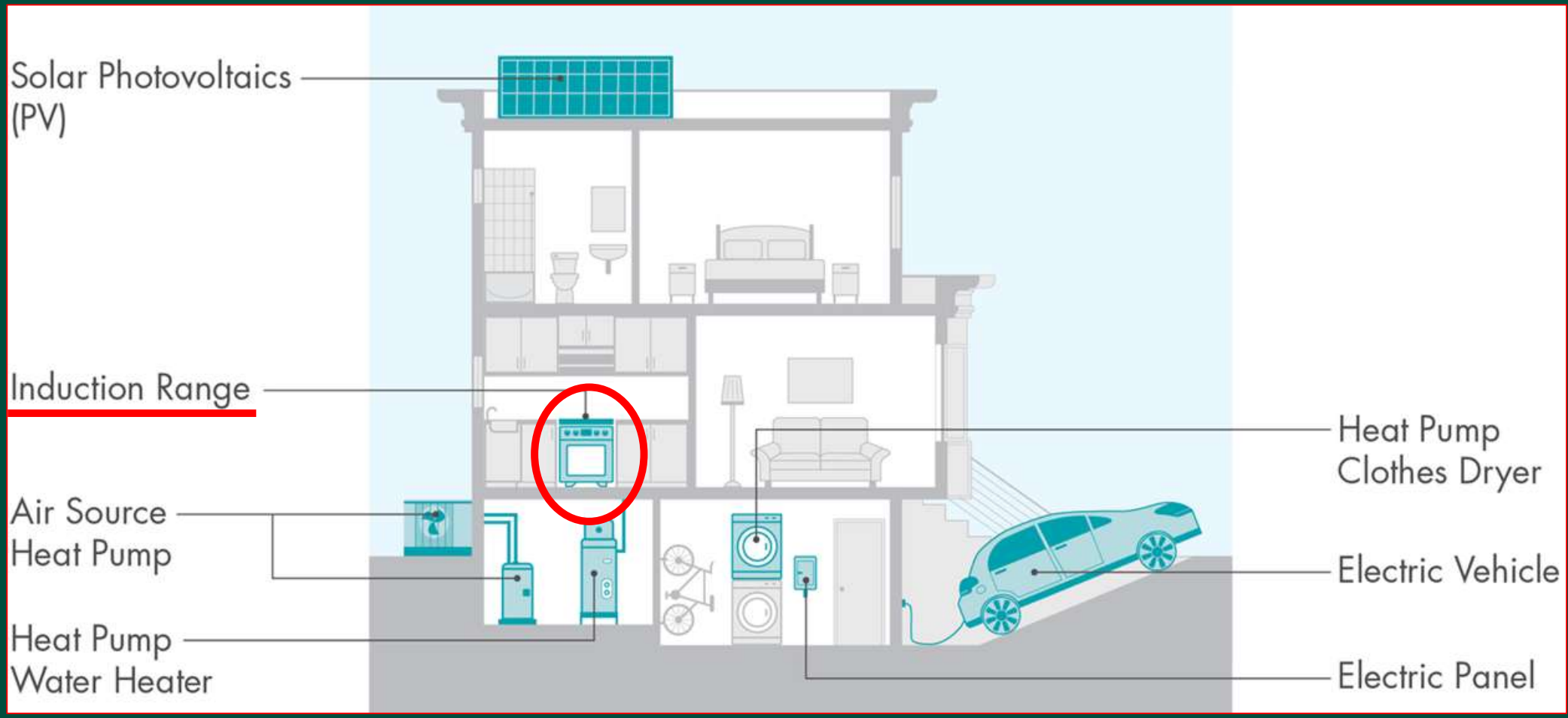
What is a HPWH?

Transfers heat from the air into the storage tank

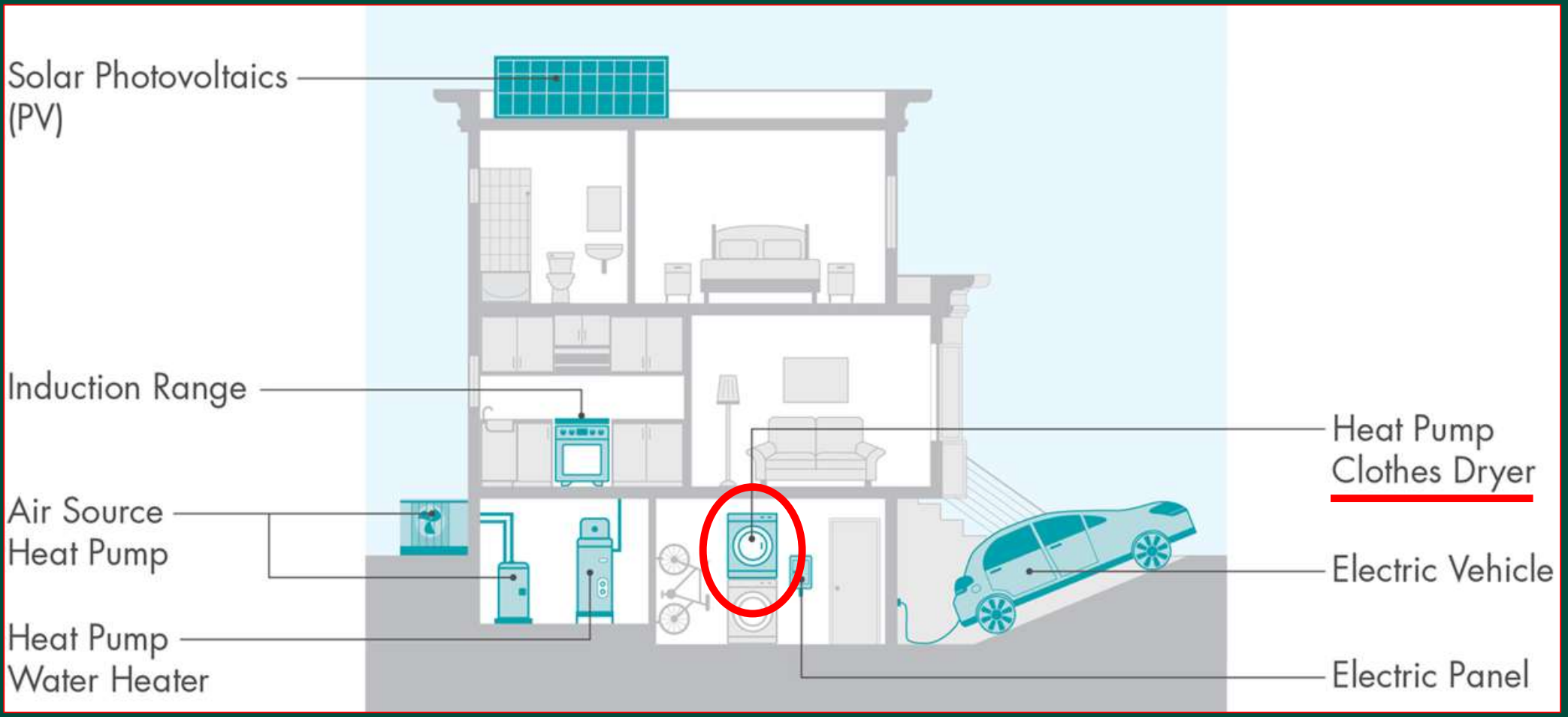
Less power than a tea kettle

Receive monthly bill credit of $50 for 2-3 years!

Induction Cooktop & Range



Heat Pump Clothes Dryer



Common Concerns

Can the grid handle electrification?

The grid was built to accommodate A/C

Heat pumps are more efficient than A/C

PG&E & State plan load forecasts years out

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Will I need a new panel if I electrify?

First appliance OK!

Rule of Thumb:
- 60 amps / multifamily
- 100 amps / single-family

Use power-efficient design to minimize upgrades:
- share circuits
- low-wattage devices
- flexible demand calcs

How can I reduce costs?

Upfront:
- rebates & incentives
- green financing

Ongoing:
- electric-friendly rate
- SFPUC bill credit
- avoid use 4-9 PM
- insulation + solar

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Resources & Incentives

Property Owners | *Strategies & Tips*

- Develop an electrification plan or ask an expert
- Identify applicable incentives, financing & contractors
- Sign up for SuperGreen electricity!

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TAKEAWAYS

- Electric is better, healthier, safer, and more comfortable
- Futureproof your home against climate regulations
- The SFPUC will reward you with $50/mo
- Start your research at BetterElectric.org
  or
  email us at BetterElectric@sfgov.org

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QuitCarbon

presents...

Getting Off Gas... Without Lots of Electricity

Families love to get together in the wonderful comfort of a total electric Gold Medallion Home

You, too, will be proud to own a Gold Medallion Home.

Its heart is flameless electric home heating. Its soul is comfort. Here your whole family can live royally with a single source of energy to serve at the flick of a switch.

For only electricity brings you clean, cool flameless cooking, flameless clothes drying, and a flameless water heater that needs no flue and stows away anywhere. In a Gold Medallion Home your whole family also enjoys modern Light for Living and Full Housepower Wiring that lets you operate as many appliances as you like efficiently and simultaneously.

Before you buy, build or modernize ask your electrical contractor about the advantages of a Gold Medallion Home or talk it over with the people at your electric utility company.

YOU LIVE BETTER ELECTRICALLY

Edison Electric Institute, 750 Third Avenue, New York, N.Y. 10017

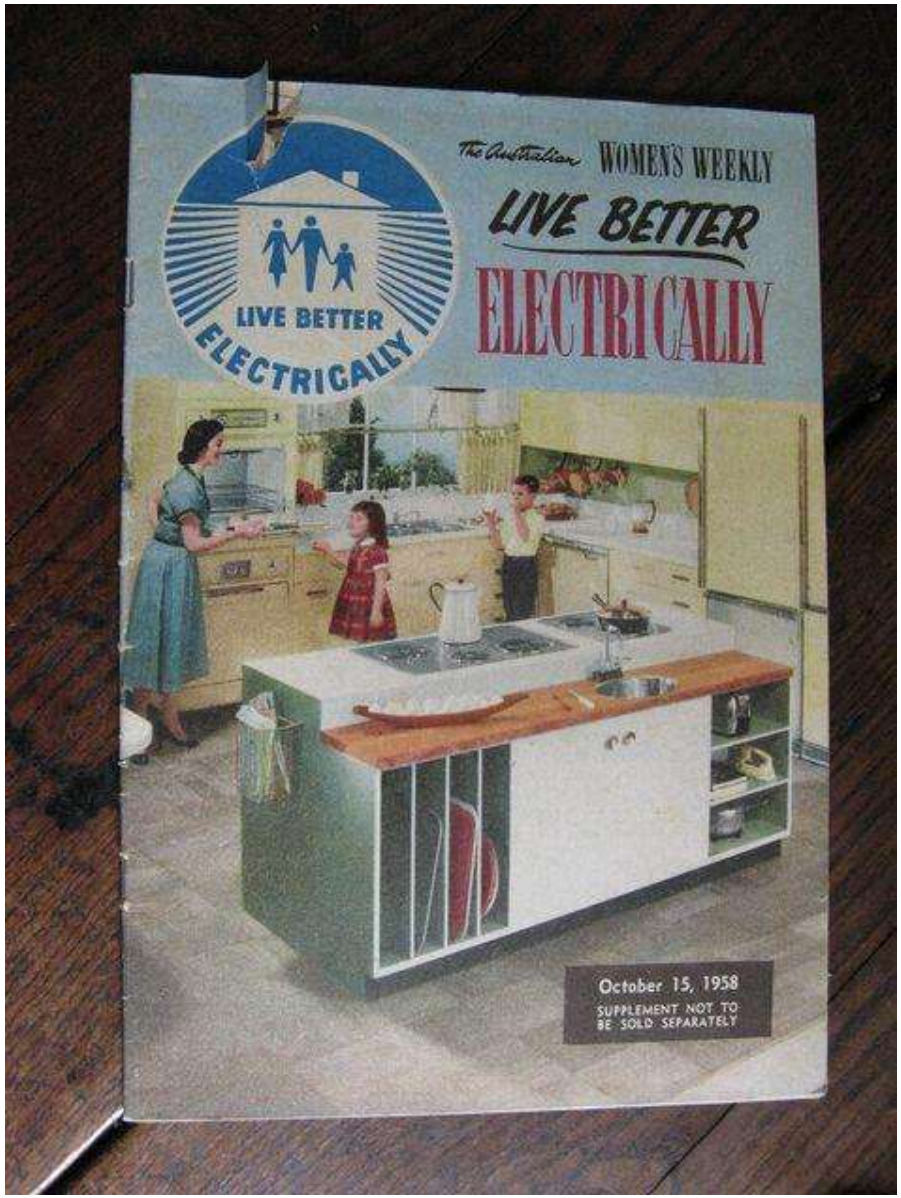
MAKE THIS YOUR YEAR TO DISCOVER THE JOY OF TOTAL ELECTRIC LIVING!

lameless electric home heating gives you wonderful feeling of comfort, delivers

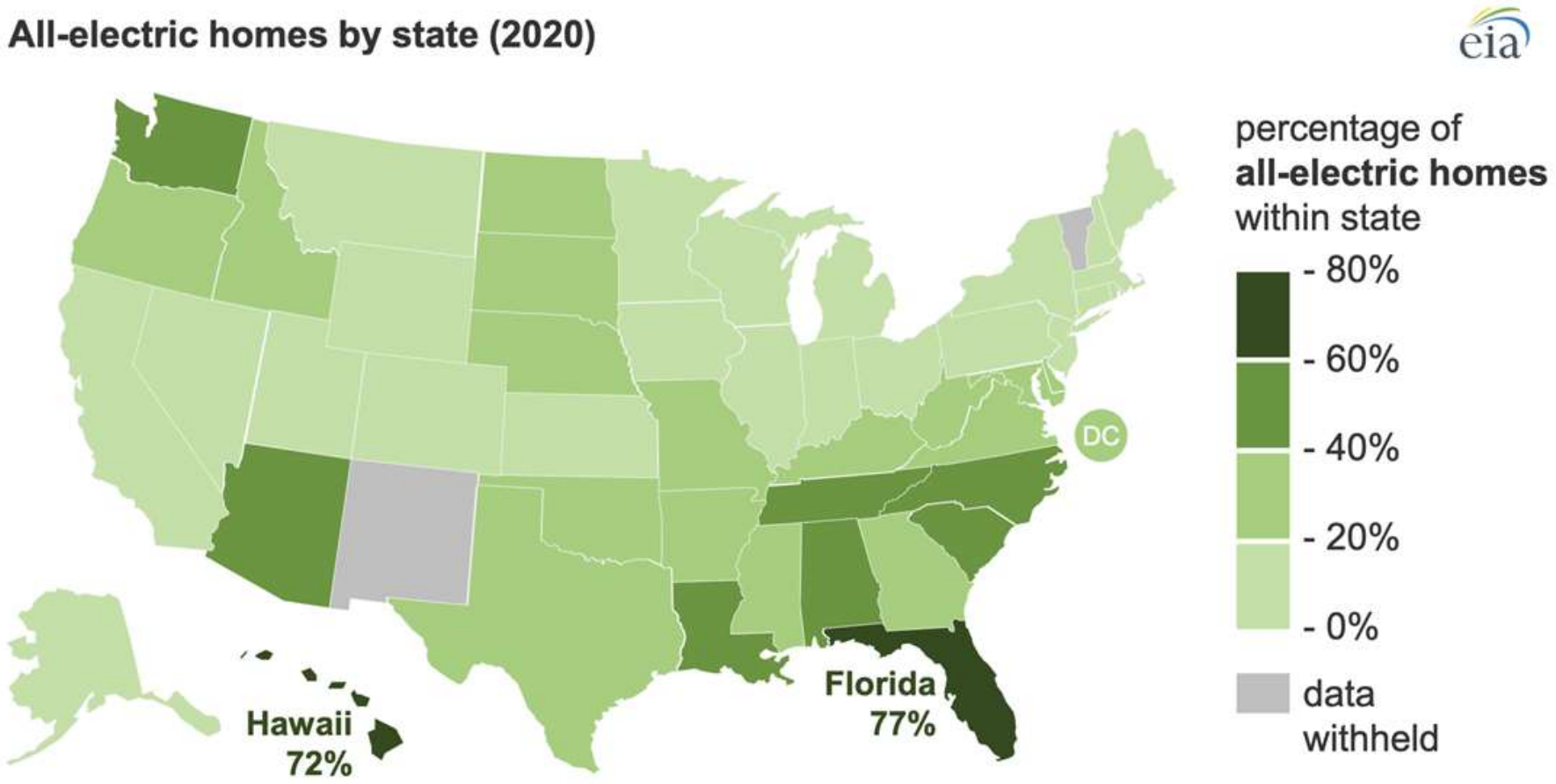
Flameless electric appliances provide modern convenience, save time, help take

Full Housepower Wiring assures plenty of outlets, switches and circuits for present

Sign of Total Electric Livi This Gold Medallion identifies



Over one-quarter of U.S. households use electricity as the only source of energy



Data source: U.S. Energy Information Administration, *Residential Energy Consumption Survey*

Sometimes an update is needed

Old, unsafe or damaged panels

Fuse Boxes

Zinsco/GTE Sylvania and Federal Pacific panels are dangerous

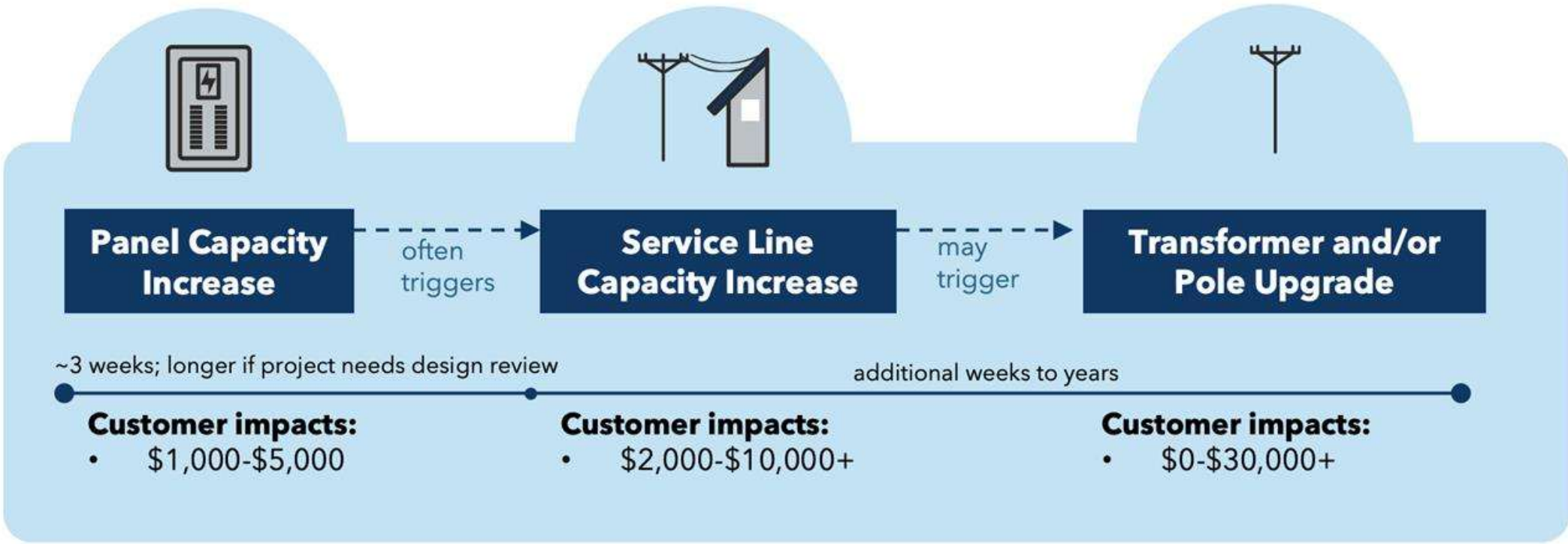
Gas → Electric = Panel Upgrade?

50 Amp
12,000 Watt
Panel

100 Amp
24,000 Watt
Panel

200 Amp
48,000 Watt
Panel

Time and Money Costs of Service/Panel Upgrades



Power Efficient Design

Optimize Load Calculations

Calculate loads to better reflect true demand

Efficiency and Right-Sizing

Save power through energy efficiency.

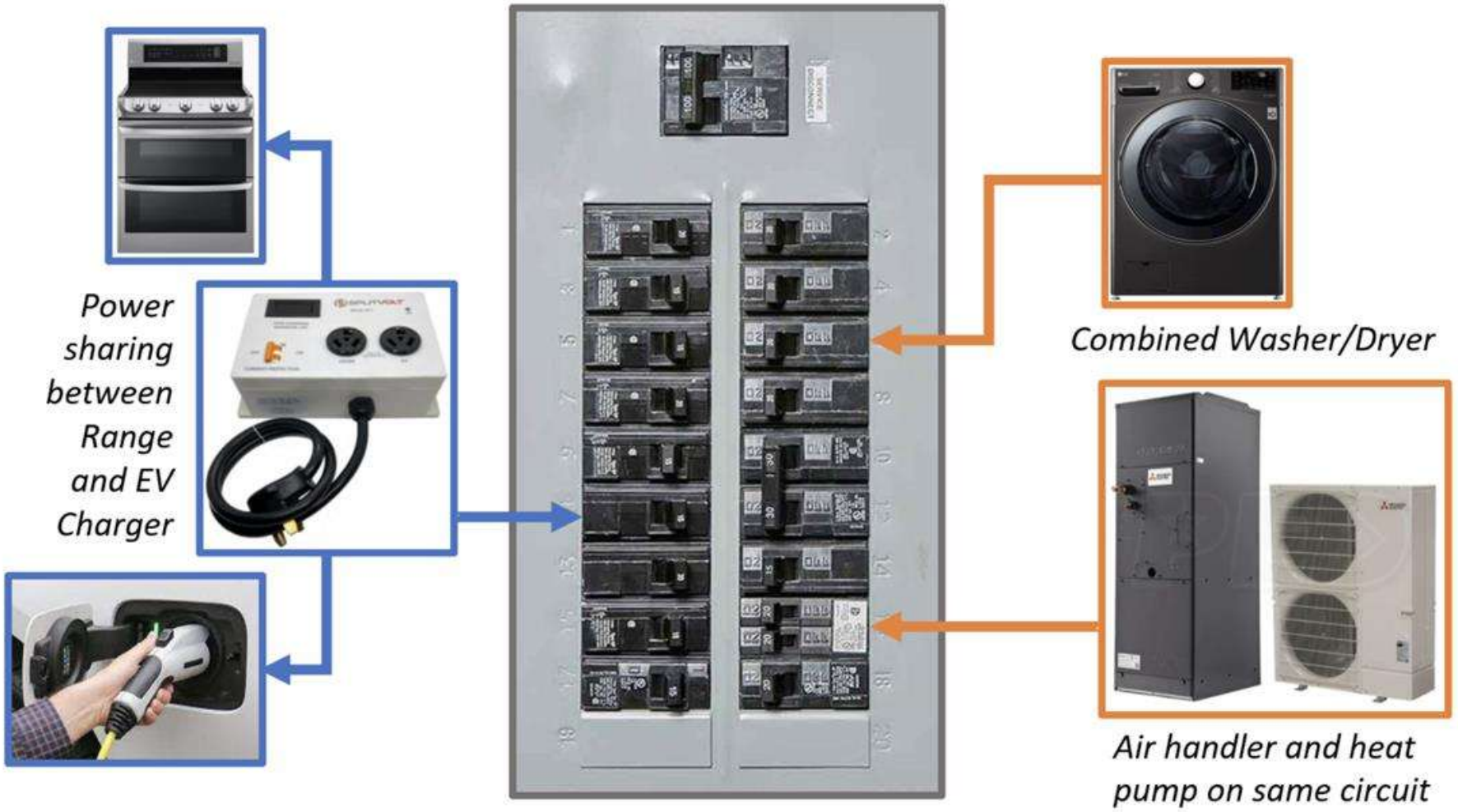
Energy Management

Monitor and control power to stay within capacity limits.

Energy Storage

Store power for when it is most needed.

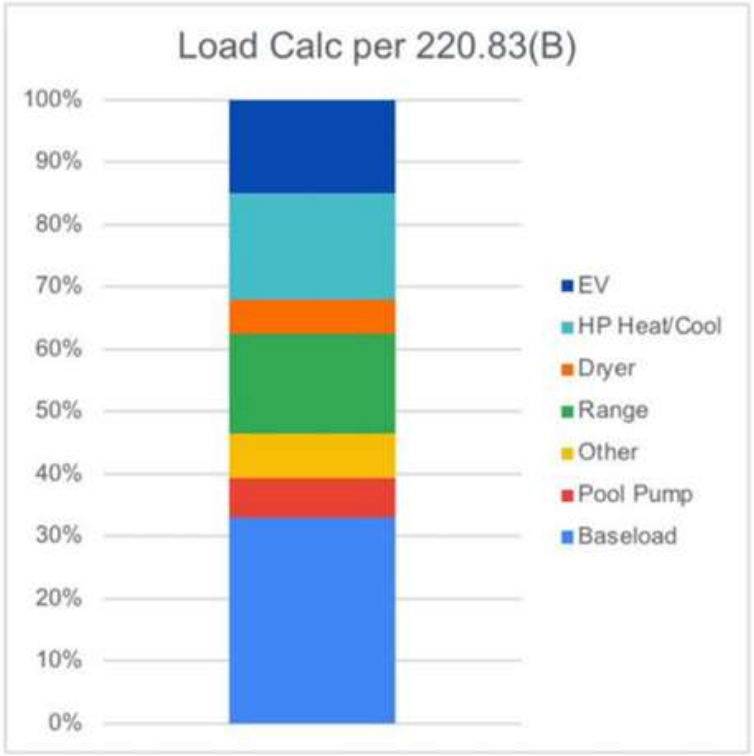
AKA Watt Diet

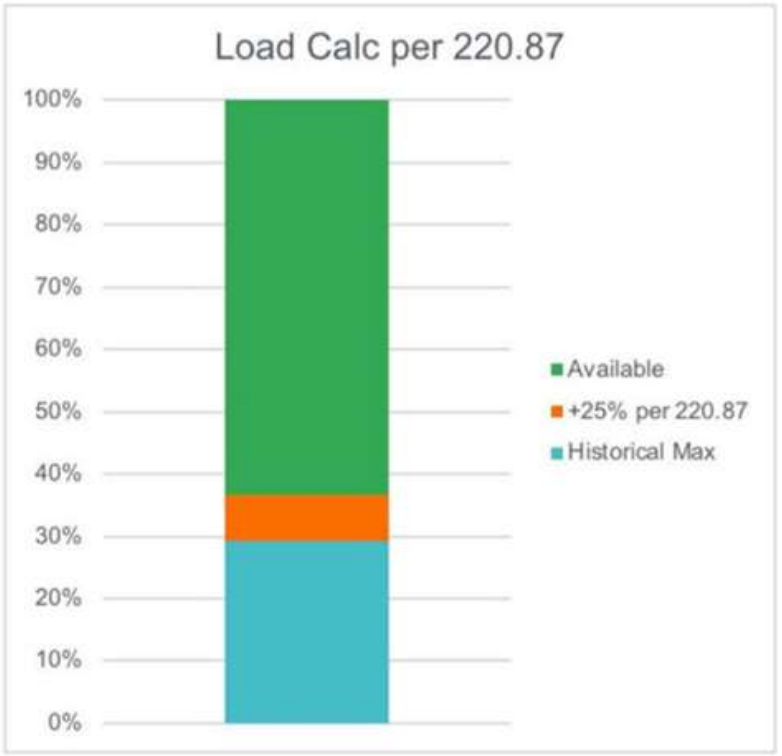


Comparison of load calculation options

Same house: Calculations using both 220.83(B) and 220.87

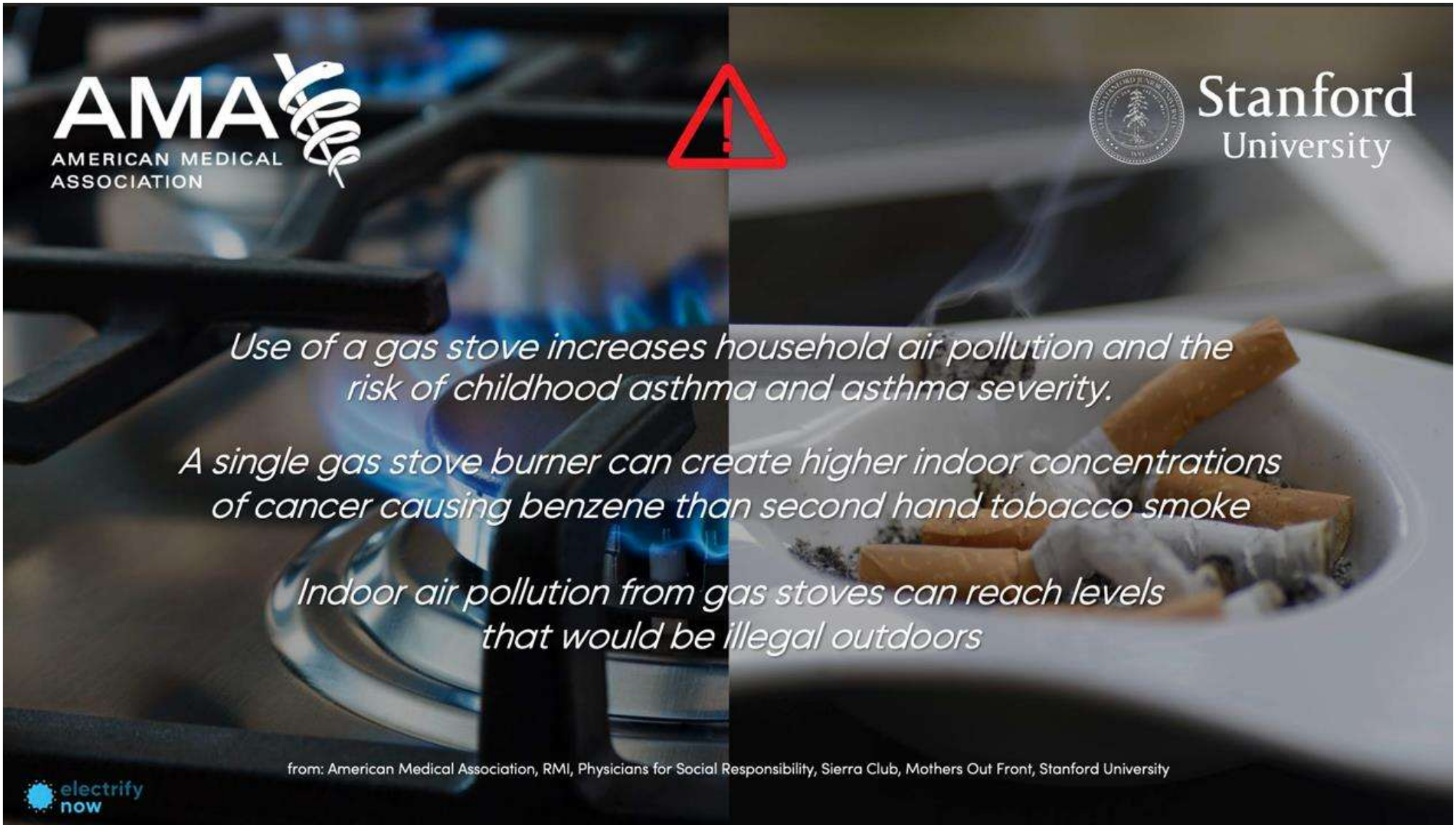
from Josie Gaillard





Per NEC 220.83(B): no room left for HPWH

Per NEC 220.87: plenty of room for HPWH


AMA
AMERICAN MEDICAL ASSOCIATION
Stanford University
Use of a gas stove increases household air pollution and the risk of childhood asthma and asthma severity.
A single gas stove burner can create higher indoor concentrations of cancer causing benzene than second hand tobacco smoke
Indoor air pollution from gas stoves can reach levels that would be illegal outdoors
from: American Medical Association, RMI, Physicians for Social Responsibility, Sierra Club, Mothers Out Front, Stanford University
electrify now

160 mg NOx/hour

from one small (7000 BTU/hr) gas burner on high

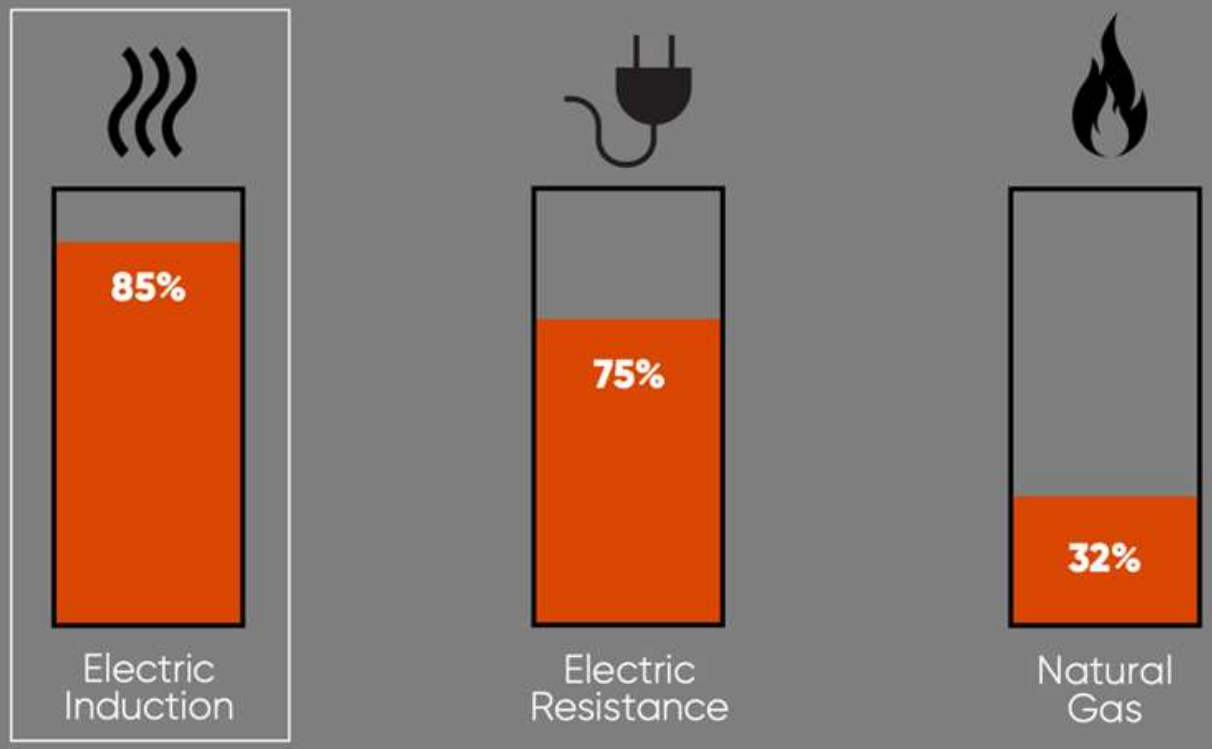
140 mg NOx/hour

from four Ford Fusion sedans idling


Induction Cooking
Better performance/ Superior indoor air quality
Precise temperature control
Faster heating and cooldown
Much easier to clean
Safer

Superior Efficiency

More useful energy delivered



from Frontier Energy: Residential Cooktop Performand And Energy Comparison Study, July 2019 - 17,000 BTU gas burner

electrify now

Superior Performance

Time to boil 8 quarts of Water

9.3 min

Electric Induction

17.8 min

Electric Resistance

18.6min

Natural Gas

from Frontier Energy: Residential Cooktop Performand And Energy Comparison Study, July 2019 - 17,000 BTU gas burner

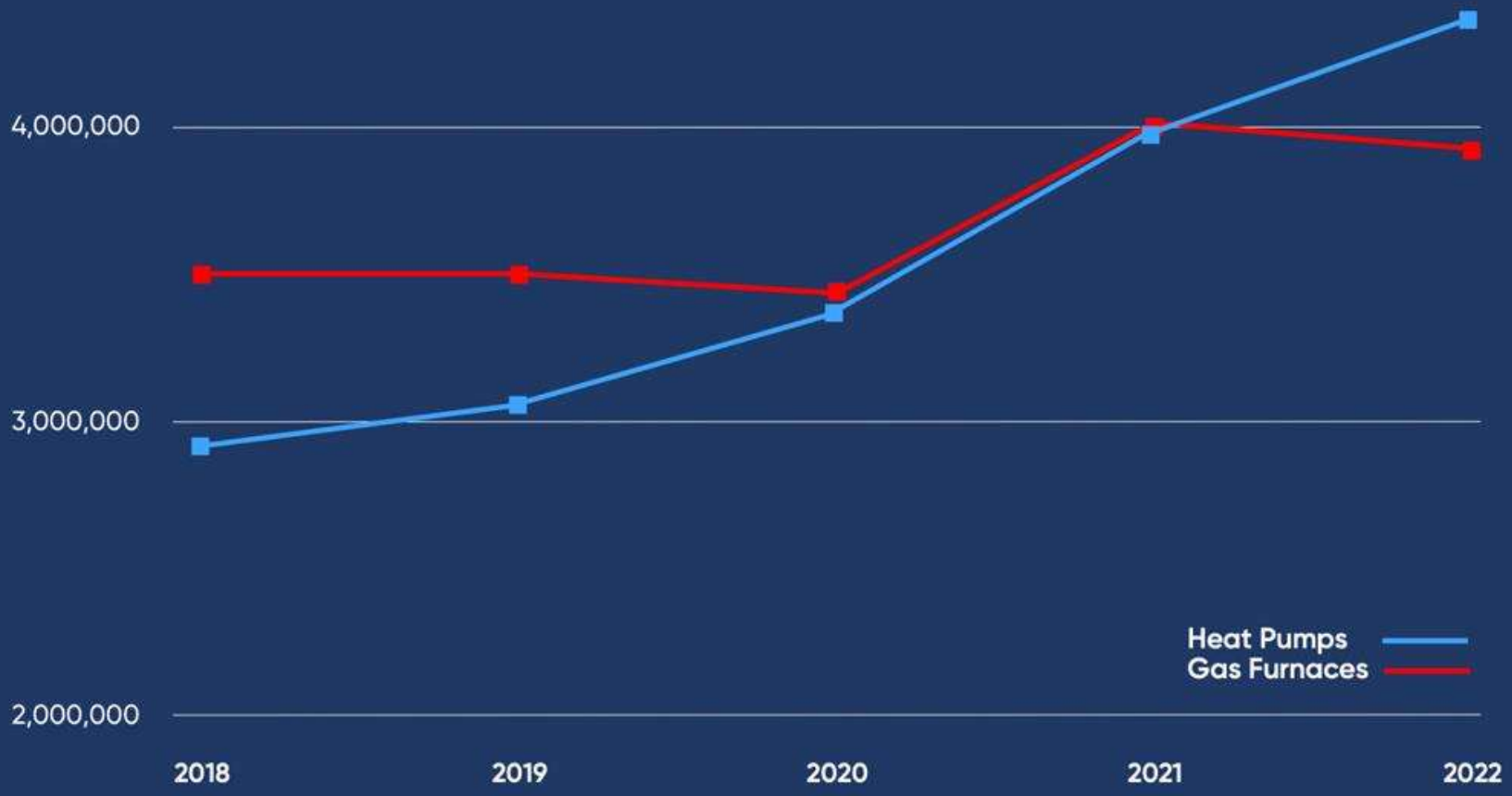
electrify now

120v Induction


YORK
YORK
YORK
YORK
Ducted/Central Heat Pump
electrify now
Ductless/Mini-Split Heat Pump


Heat Pump Space Heating/AC
Heating and Cooling with one system
More constant temperatures
More continuous air movement
More air filtration
Superior Comfort
Avoid 4-8 Tons carbon emissions
electrify now

Americans prefer Heat Pumps!

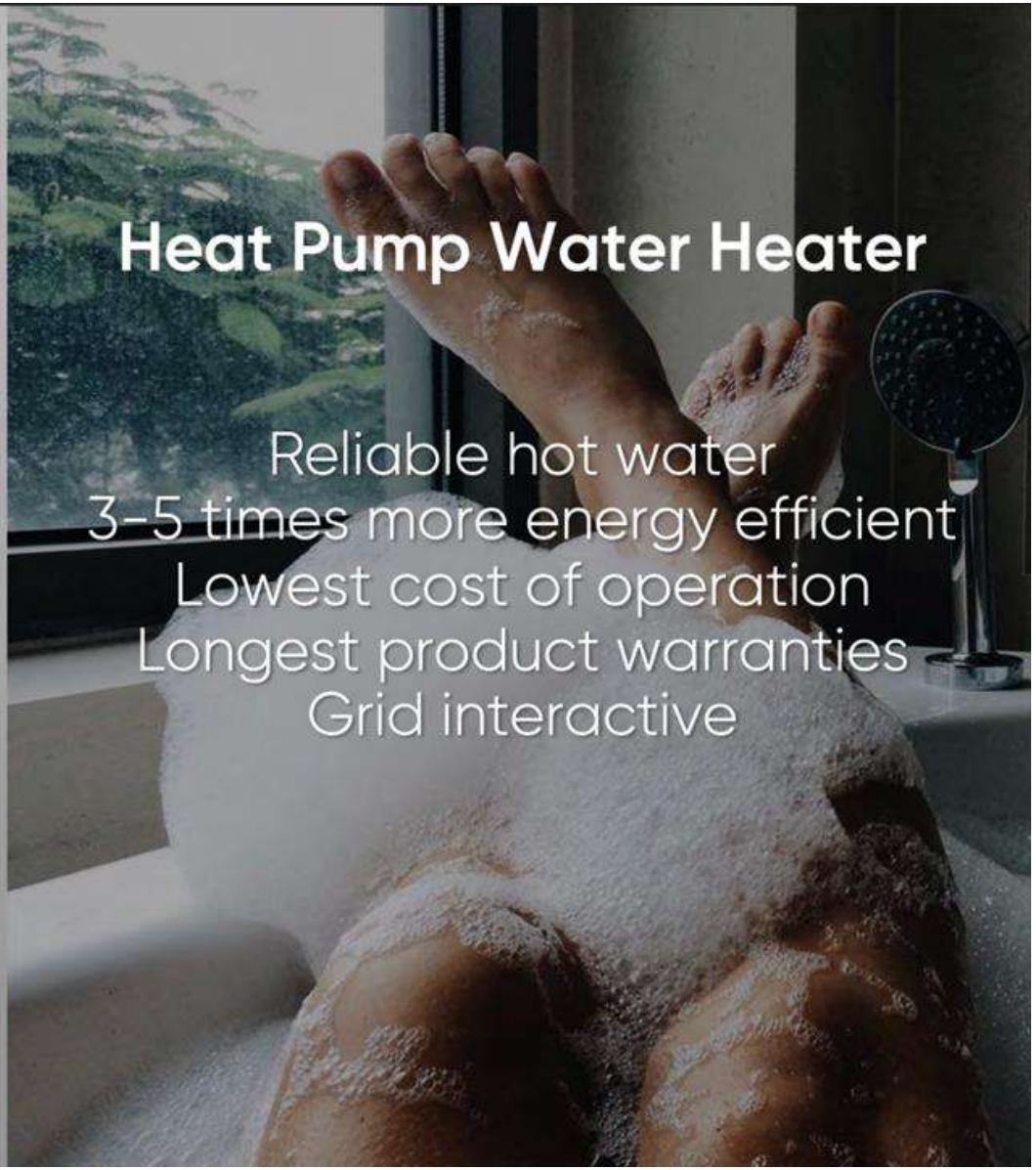


US Heat Pump vs Gas Furnace Sales
AHRI Heating and Cooling Equipment Shipment Data

electrify now

120v HVAC
Heat Pumps


EVAPORATOR
COMPRESSOR
STORAGE TANK
WATER
CONDENSER COIL
electrify now


Heat Pump Water Heater
Reliable hot water
3-5 times more energy efficient
Lowest cost of operation
Longest product warranties
Grid interactive

10 year warranties

Rheem

AO Smith

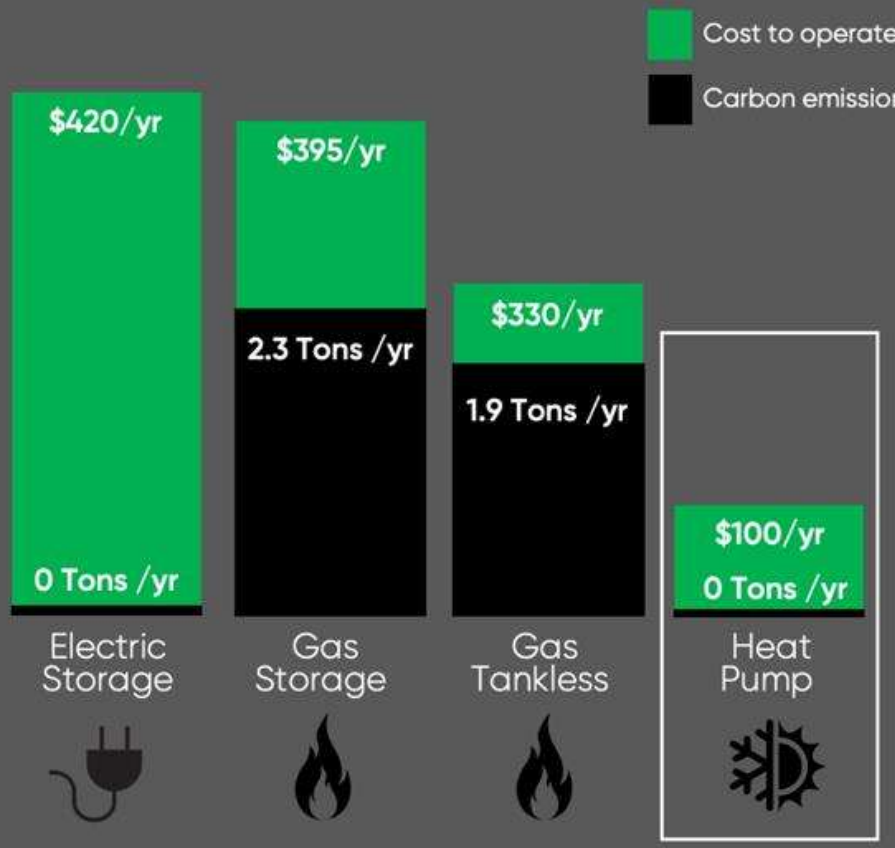
Bradford White

electrify now

From Energy Guide Labels for energy consumption, 2023 Oregon average energy prices and fuels carbon intensity

Heat Pump Water Heater

3-5 times more energy efficient
Lowest cost hot water
With renewable energy



120v Heat Pump Water Heaters

120v Heat Pump Dryers (and Washers!)

Conventional "Efficient" Appliances (240V)

Product Type	Electric Dryer-Energy Star	Heat Pump Water Heater	Split Heat Pump 2-4 Tons
Maximum Rating	30A, **7,200W**	19A, **4,500W**	18-29 Amps, **4,300W-7,000W**
Make and Model	Whirlpool WED5620HW	Rheem Prestige	York YZH060 Series
Image			

Power Efficient Appliances (120V)

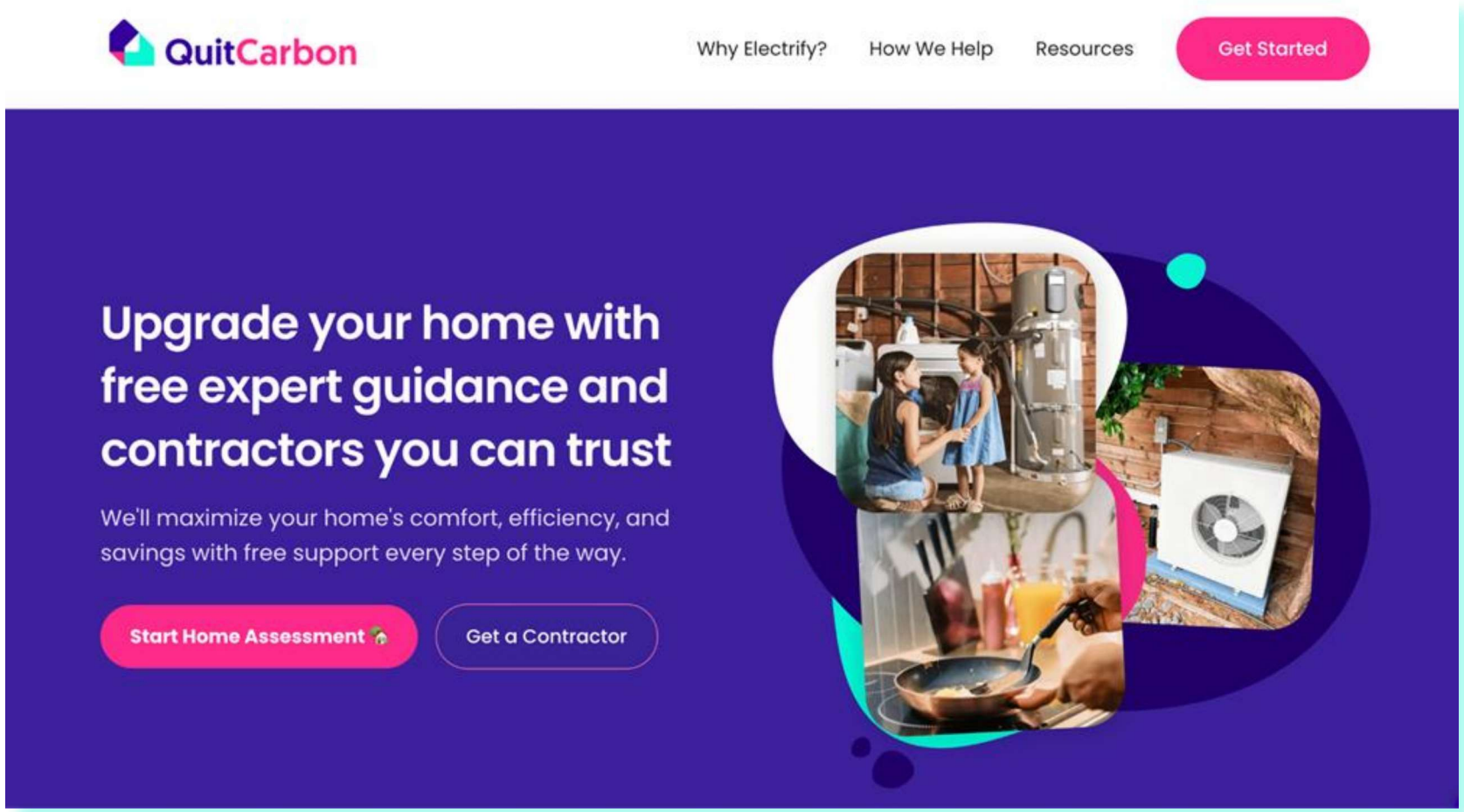
Power at the panel is the limiting factor, but reducing appliance voltage can be another strategy

Product Type	4.5 cu ft Condensing Washer/Dryer Combo	Heat Pump Water Heater	Low-Amp Window Heat Pump	120V Mini-Split Heat Pump
Maximum Rating (Amps, Watts)	10A, **1200W**	8.3A, **1000W**	6.3-15A, **~1400W**	10.4A, **1090W**
Make and Model	LG WM3998HBA	GE GeoSpring	Innova HPAC 2.0	LG LS-120HXV
Image				

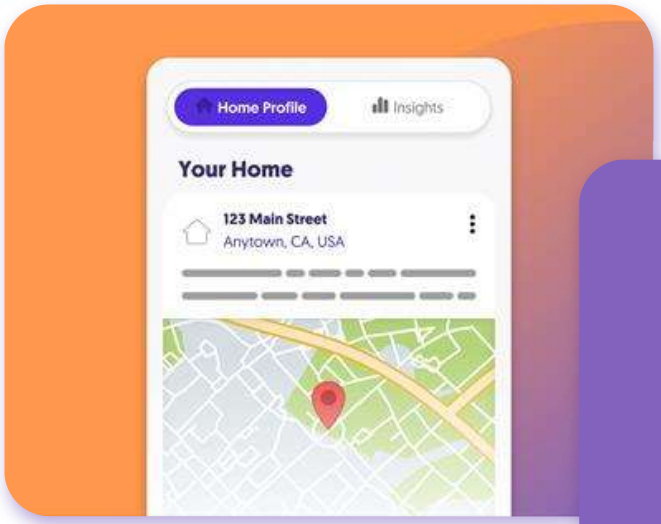
Power Efficient Appliances Example Calculation

Typical Energy Efficient Appliance		Power Efficient Appliance	
Device	Power (W)	Device	Power (W)
2 ton Heat Pump	4,400	120V minisplits	1,100 (x2?)
Water heater	4,500	120V HPWH	1,000
Clothes Dryer	7,200	120V HP washer/dryer	1,200
Range	9,600	120V 2-burner cooktop and 120V Countertop Oven	1,200 1,200
EV charger	7,200	EV-pauser/circuit sharer	0
Total	**32,900**		**5,700**

QuitCarbon


QuitCarbon
Why Electrify?
How We Help
Resources
Get Started
Upgrade your home with free expert guidance and contractors you can trust
We'll maximize your home's comfort, efficiency, and savings with free support every step of the way.
Start Home Assessment
Get a Contractor

QuitCarbon Experience



Assess

Optimize

Upgrade

www.QuitCarbon.com

GRADIENT

Revolutionary Window Heat Pumps

2025

The Gradient All-Weather 120V Window Heat Pump

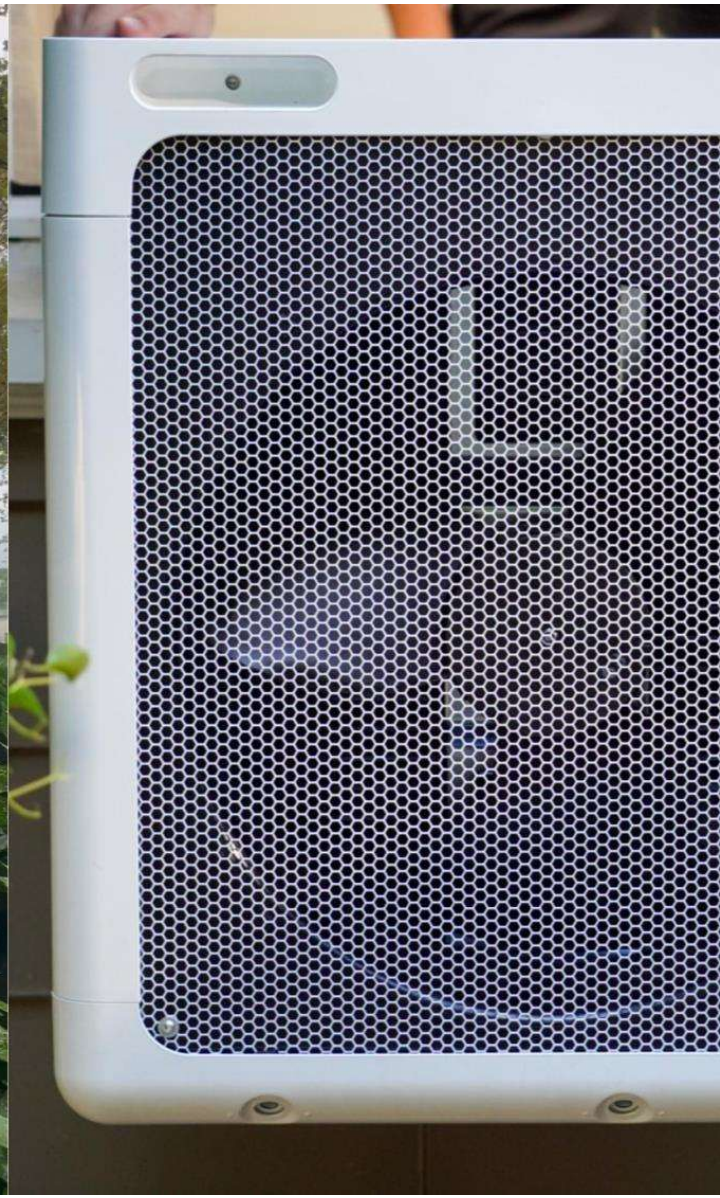
GRADIENT

Gradient

- Heats & cools 500 square feet
- All electric heat pump (same components as minisplit)
- Plugs into a 110v outlet
- Installs through a single or double hung window
- Installable by two building staff
- 45 minutes to install
- Handles condensate automatically through 3 vents on the outside
- 3 times more efficient than steam heat
- Reduce electric utilities by 50% vs. baseboard heaters or window AC
- Approved by City Planning for Historic Buildings in San Francisco

Atomizers in Action

- ➔ Atomizers automatically turn on to dispose of meltwater & condensate produced by unit operation
- ➔ Atomizers prevent dripping
- ➔ Condensate filter is cleanable and replaceable, accessible on interior unit



30% Cheaper than a MiniSplit to Install

- Fast, low-cost install
- Uses ⅓ power of a space heater
- Washable filters

CapEx Cost Comparison (per room)

	Gradient	Mini-split
HARDWARE	$3,500	$1,200
INSTALLATION	$300-$500	$2,100
ELECTRICAL UPGRADES	$0	$1,400
OTHER	$0	$1,100
TOTAL	**~$4,000**	**$5,800**

TECH Clean $2k per HP – Nov 19–Dec 12, 2025

Standard Incentives – Multifamily HP HVAC

HP HVAC Program Category	Sub Category	Incentive Level
HVAC - Package Terminal Heat Pumps (In-unit or Common Area)	1 or 2 speed PTHP (traditional form factor)	$1,000 (per equipment)
HVAC - Variable Capacity Room Heat Pumps (In-unit or Common Area)	Variable Capacity Heat Room Pumps (non-split systems or non-rooftop systems)	$2,000 (per equipment)
HVAC - Split or Packaged Rooftop/Multi-Position Heat Pump (Ducted or Cuctless, In-unit or Common Area)	Split or Packaged Rooftop/Multi-Position Heat Pump (ducted or ductless)	$4,000 (per compressor)
HVAC - Air-to-Water Heat Pumps	Air-to-Water Heat Pumps for space conditioning only or combi-systems for space and water heating conditioning	$8,000 (HVAC only or Combi HVAC+DHW)
Central Multi-Apt HVAC (2+ apt)	HP HVAC equipment serving multiple apts	$1,500 per apt served

California GoGreen Financing Multifamily

- Can be braided with TECH
- Finance up to 100% of project costs
- No property liens
- Upgrades for common areas and in-unit
- Multiple financing choices
- Option to add non-energy upgrades

PG&E California Energy Smart Homes Program (CESHP)

- Whole building electrification
- Work must be permitted
- $2,200 per apartment including Gradient
- $600 per apartment for electrification

New York City Housing Authority

Overview

- Public housing authority in NYC
- 36 total Gradient Heat Pumps
- 12 apartments

Baseline Equipment:

- Steam radiators
- Window ACs

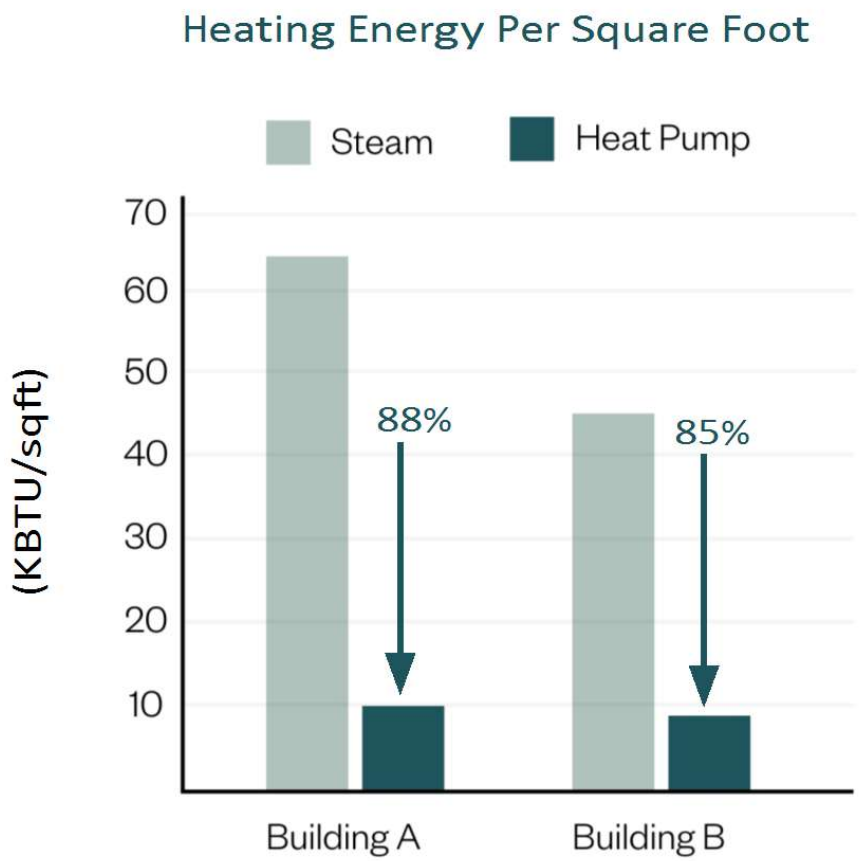
Installation

- Building management staff installed in October, 2023
- 45 minutes to 1 hour per unit

NYSERDA M&V Results[1] on NYCHA Project

Energy Efficiency, Cost Savings, & Environmental Benefits

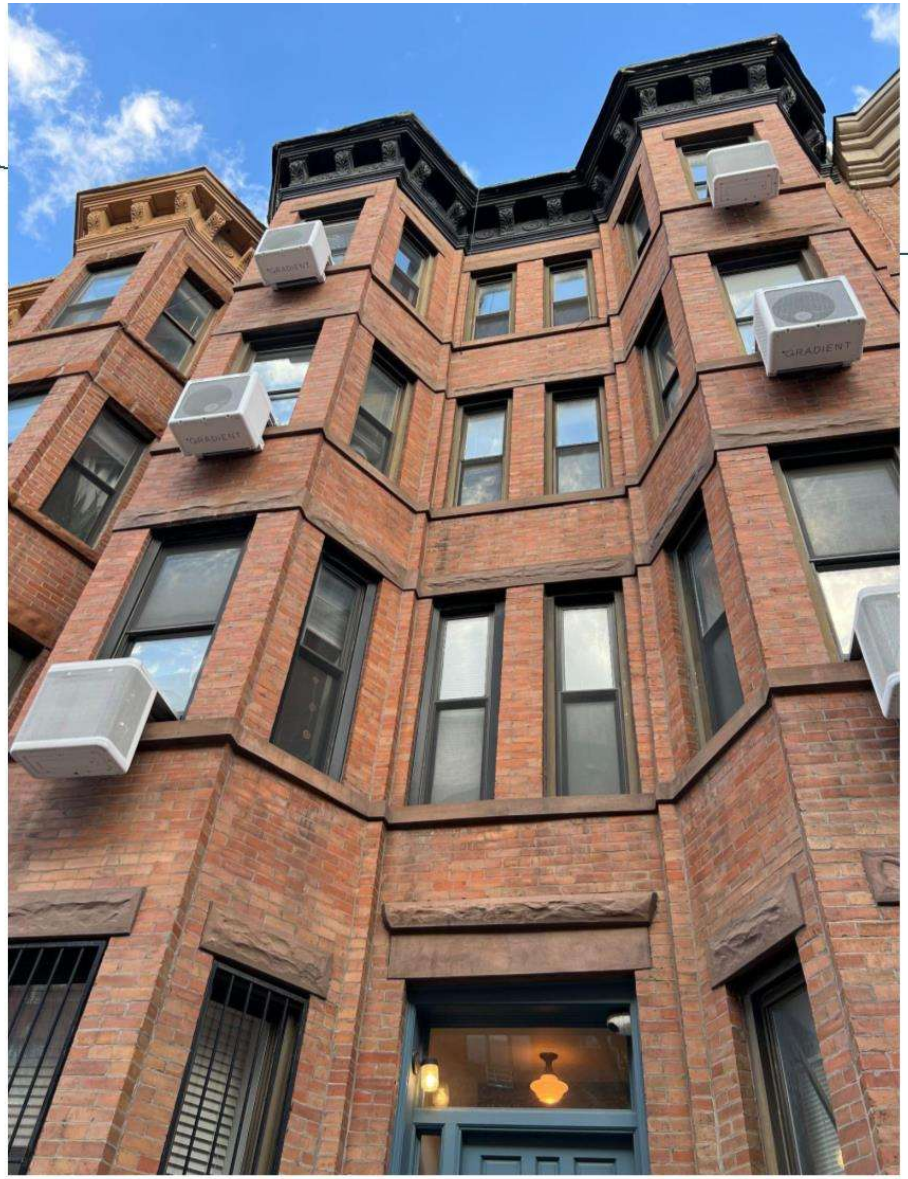
- Energy Savings: 85-88%
- Utility Savings: 49-60%
- Greenhouse Gas Reduction: 76-81%
- Minimal Impact to Electrical Load: Only 30% of building load from heat pumps at peak



Source: NYSERDA Roundtable, 7/26/24; https://be-exchange.org/wp-content/uploads/2025/01/20250116_CleanHeat_Slides-UPDATED.pdf

10X

Reduction in Installation Time Compared to Ductless Mini Splits



- → Installable by 2 people
- → Limited tenant disruptions
- → No refrigerant lines
- → No drilling or modifications to the building envelope
- → Self contained condensate management

Thank You!

Questions?

peter.dumanian@gradientcomfort.com

GRADIENT


OLIMPIA SPLENDID
HOME OF COMFORT
BEAUTIFUL OUTSIDE


COMFORTABLE INSIDE

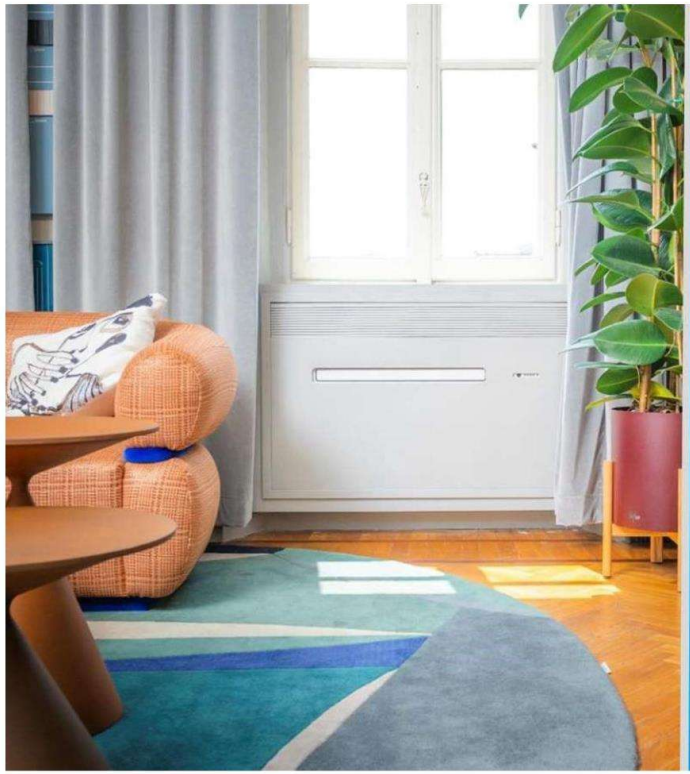
MAESTRO

Why MAESTRO ?

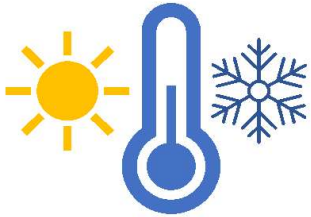
Why Are We Here…Unique Solution for

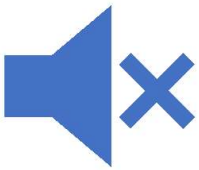
1. Student Housing
2. Assisted Living
3. Multi-family
4. Hospitality
5. Modular Housing

MAESTRO PRO
With no outdoor unit



THE SILENT - INVISIBLE SOLUTION TO DECARBONISE YOUR HOME





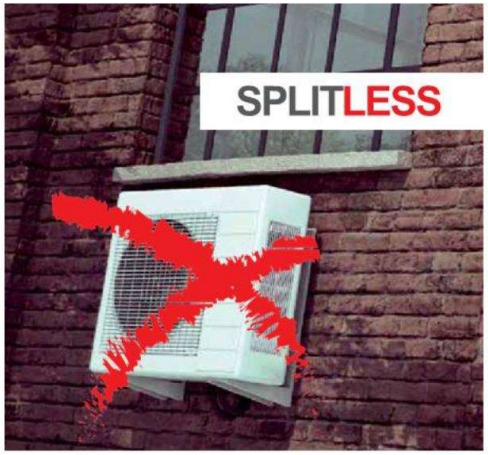
NO EXTERNAL UNIT	HEAT PUMP	EASY AND FAST INSTALLATION	SILENT… REALLY SILENT

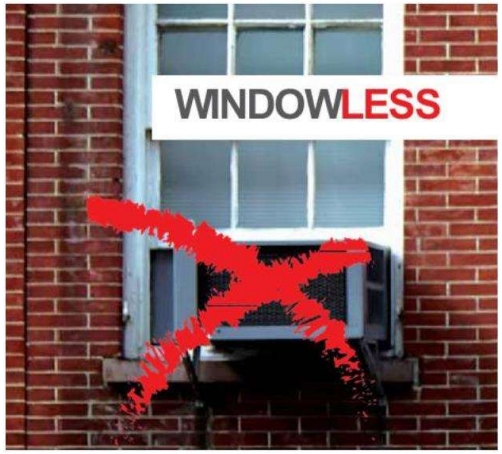
R32

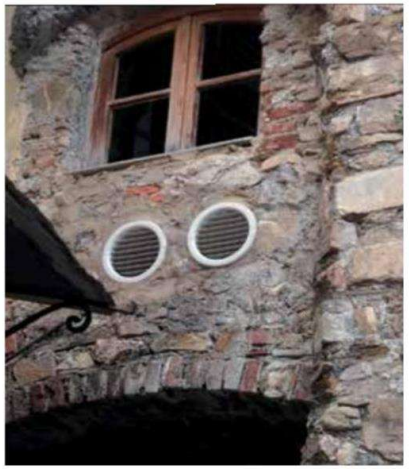
AHRI CERTIFIED™

No Outdoor Unit

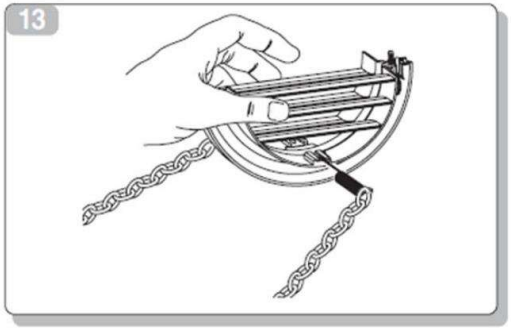
OLIMPIA SPLENDID
HOME OF COMFORT

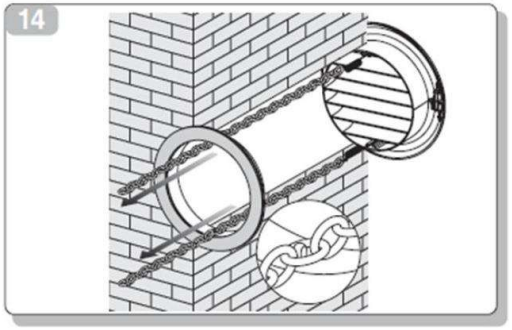


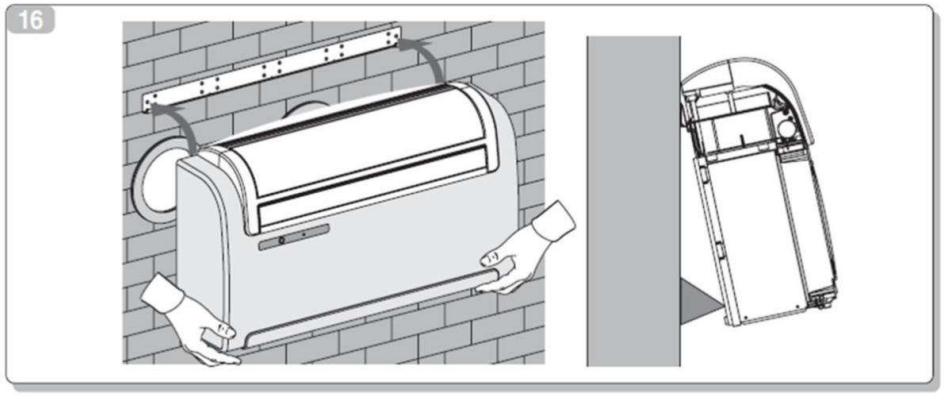




3 Easy step of installation

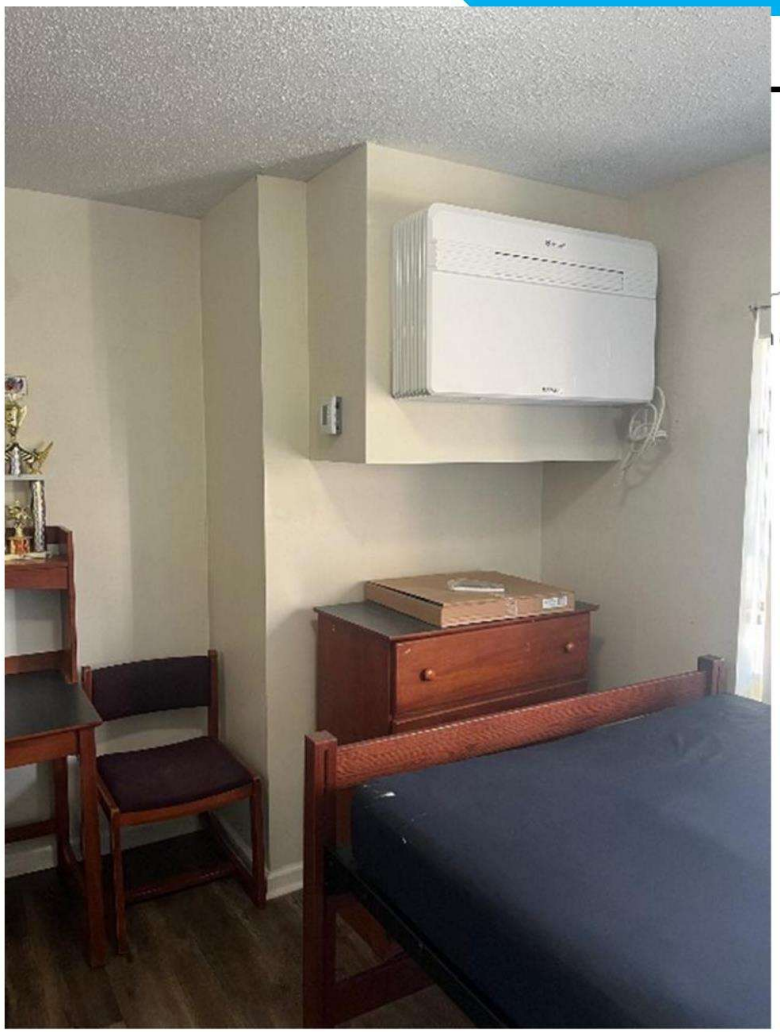




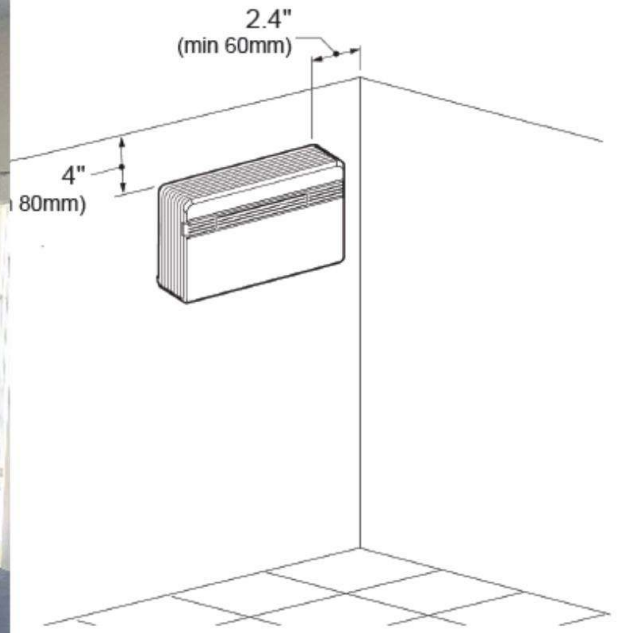


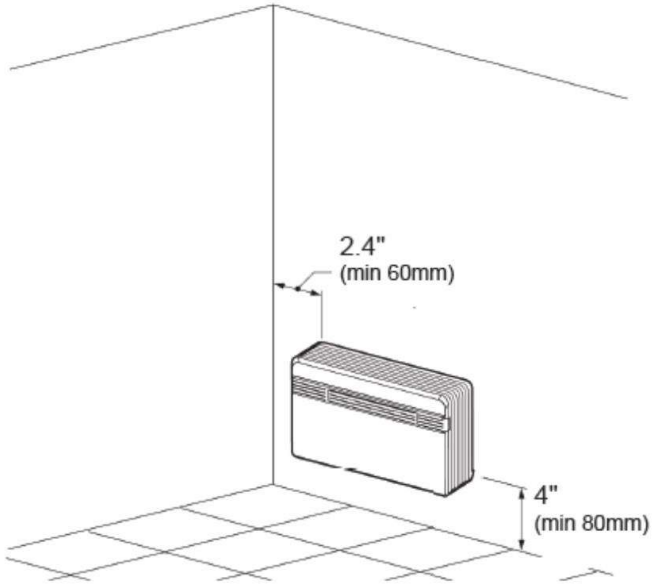
SMALL SIZE & FLEXIBILITY OF INSTALLATION

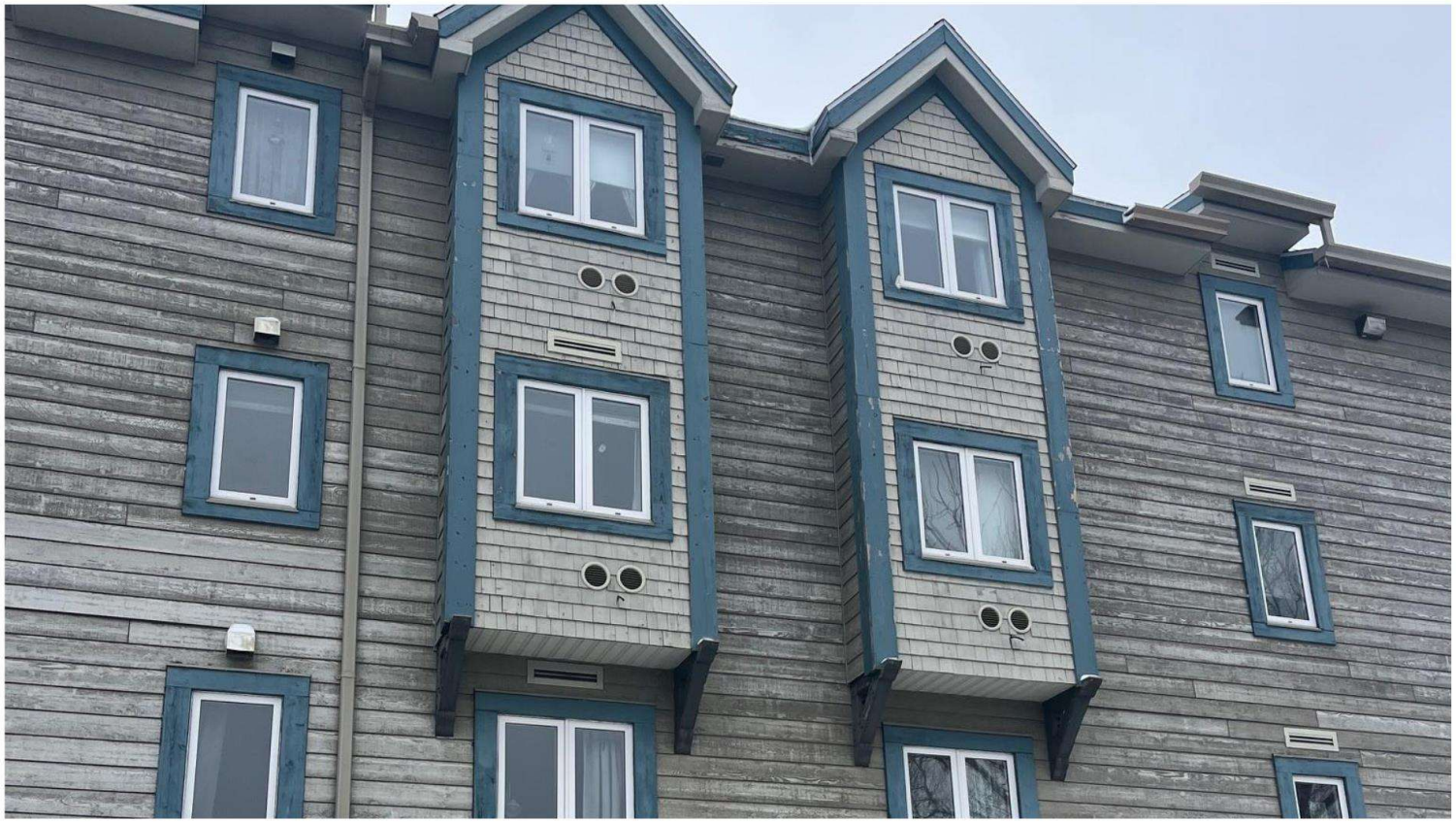
OLIMPIA SPLENDID
HOME OF COMFORT



LEARANCES:







THE MAESTRO SOLUTION

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THE MAESTRO SOLUTION

PTAC Replacement

THE MAESTRO SOLUTION

MAESTRO
products range

MAESTRO
With no outdoor unit

Maestro Pro Inverter 12HP-R32

115V
11,600btu

2452

Maestro Pro Inverter 12HP-R32

208/230v
10,600btu

2kW

2451

Maestro Pro Inverter 12HP-R32

208/230v
11,600btu

2450

NEW Tower 12HP #2475

208/230v

Tower 12HP #2476

2kW

208/230v

Tower 12HP #2475

208/230v

12,000btu

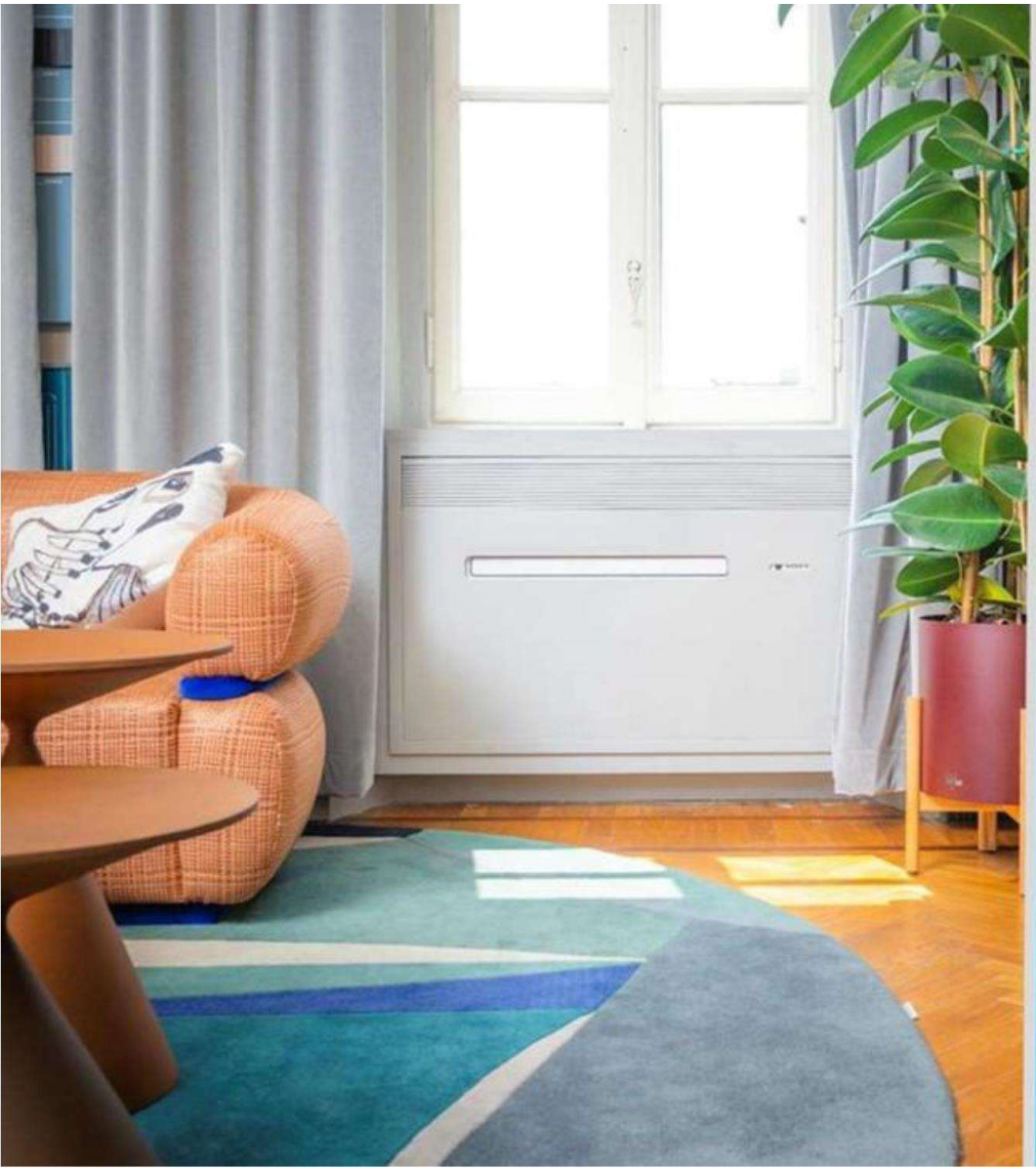
Tower 12HP #2476

208/230v

12,000btu

2kW
ELECTRIC
HEAT


MAESTRO
TOWER



OLIMPIA SPLENDID

HOME OF COMFORT