Is a Heat Pump Water Heater Right for Me?

April 11, 2024

Agenda

- Incentive Stacking with 3C-REN
- Heat Pump Water Heaters with Gregg Holladay of Bradford White Water Heaters
- The Homeowner Experience

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

Coming in 2025...

Commercial, Agricultural, and Energy Assurance Programs!

Incentive Stacking

Cost Savings for Central Coast Residents

April 11, 2024 | Lori La Riva

Stacking Incentives

Central Coast Community Energy

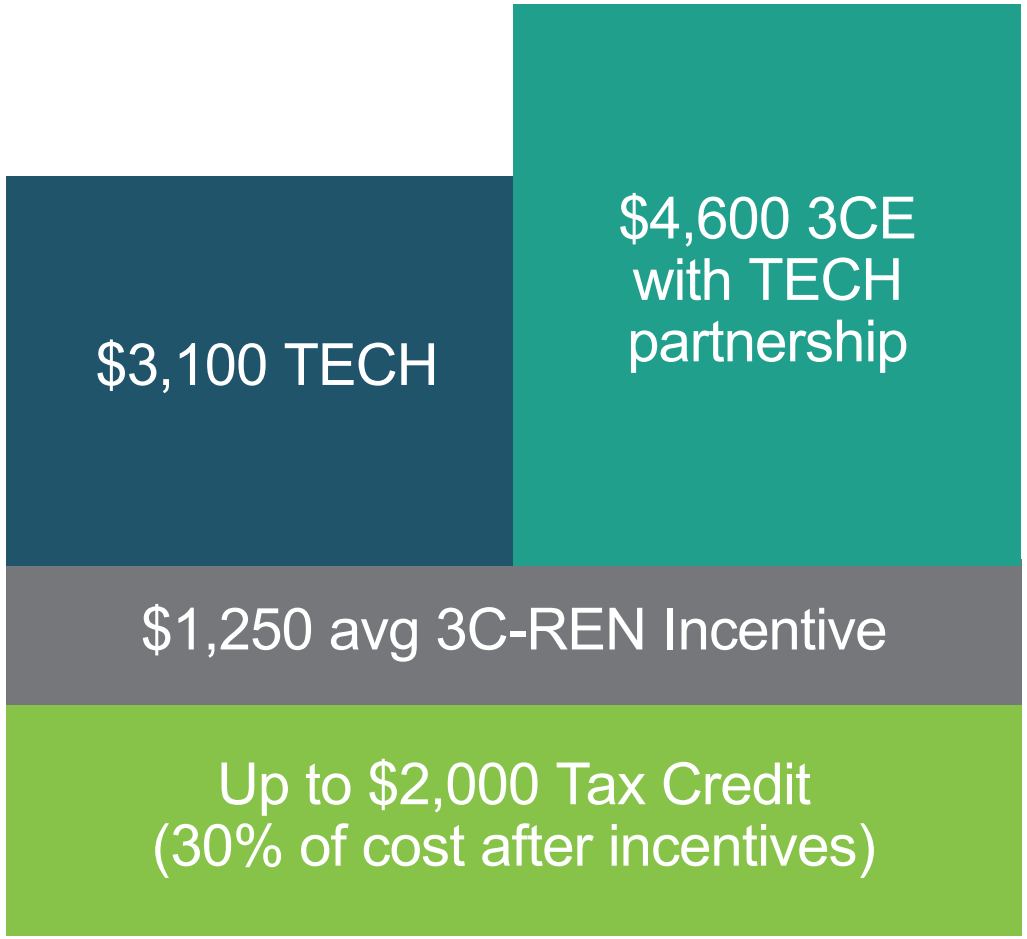
TECH CLEAN CALIFORNIA

3C-REN HOME ENERGY SAVINGS

Inflation Reduction Act (IRA)

What do we mean by stacking?

Check out this example heat pump water heater project:



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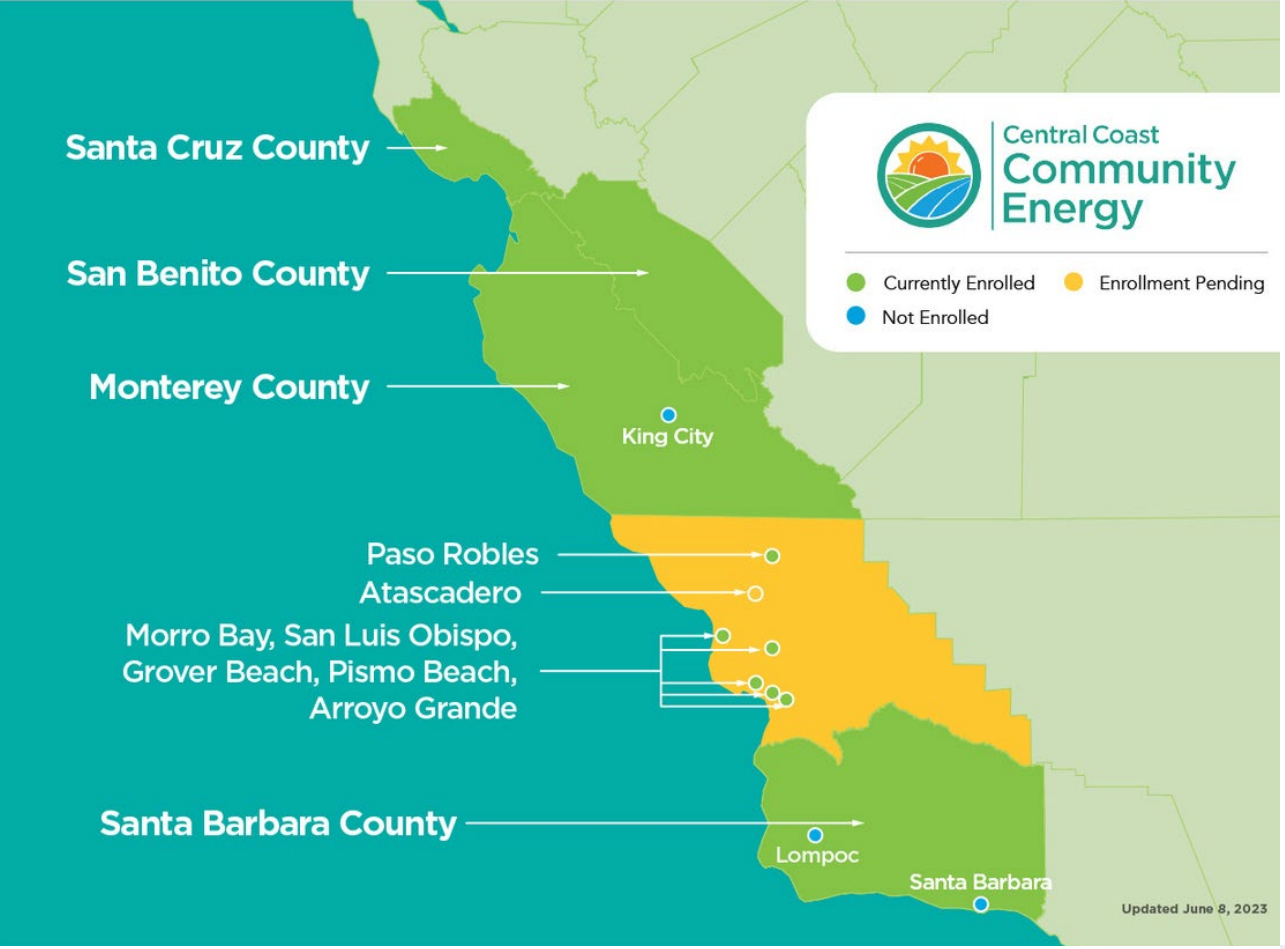
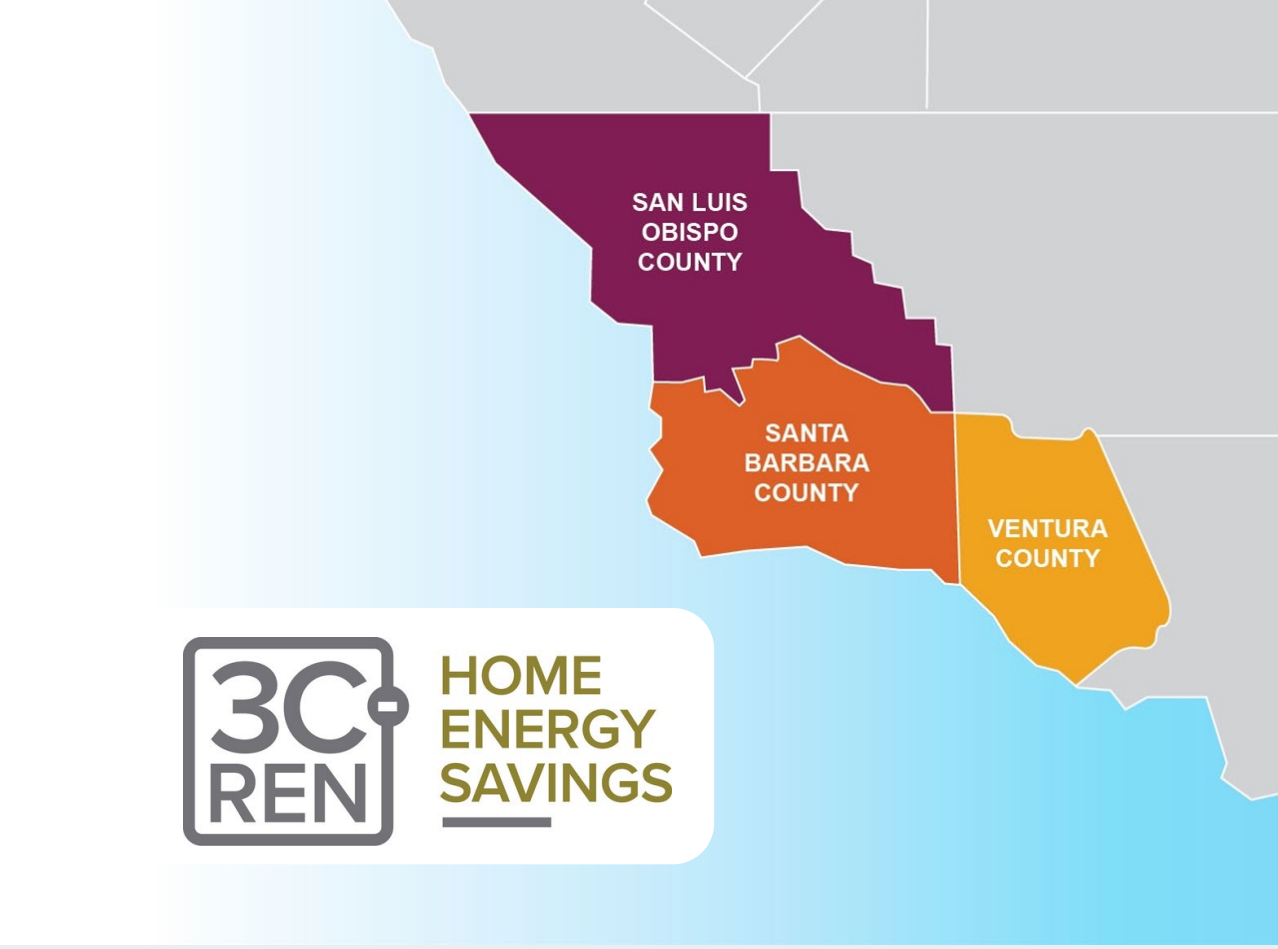
3C-REN HOME ENERGY SAVINGS

Inflation Reduction Act (IRA)





3C REN HOME ENERGY SAVINGS

TECH CLEAN CALIFORNIA

Inflation Reduction Act (IRA)

Central Coast Community Energy

Electrify Your Home

- Provides cash incentives to enrolled contractors for heat pump projects in the 3CE service area, in partnership with TECH Clean California.
- Incentives for projects switching gas-powered* water heaters and HVAC equipment to all-electric.
- Incentives for appliance costs and costs related to electric panel upgrades or replacement.

*natural gas or propane

3C REN

TECH CLEAN CALIFORNIA

Heat Pump Incentives

- Incentives for single-family heat pump HVAC projects and related panel costs.
- Incentives for heat pump water heaters and related panel costs (required enrollment in demand response program and time-of-use rate).
- As with 3CE, **only available through TECH-enrolled contractors.**

Heat Pump Incentives from 3CE and/or TECH

Heat Pump HVAC System

- 3CE customers: **$1,500–$2,500**
- Other CA customers: **$1,000**

Heat Pump Water Heater

- 3CE customers: **$3,300 or $3,800**
- 3CE customers who enroll in a demand response program and time of use rate: **$4,600–$6,800**
- Other CA customers who enroll in a demand response program and time of use rate: **$3,100–$5,300**

Electrical Panel Upgrades

- **$2,000** when part of a heat pump project

Incentives shown are for market-rate customers and are **$1,000–$2,000** higher for income-qualified customers.

As of 2/5/24, PG&E gas customers (parts of SLO County) can no longer get market-rate HPWH funding from TECH. Equity-rate funding is still available.

How to Participate with 3CE and/or TECH

3CE Electrify Your Home Overview
https://3cenergy.org/rebates/electrify-your-home

TECH Clean CA Incentives & Contractors
https://incentives.switchison.org

3C REN HOME ENERGY SAVINGS

Single-Family Program

- Discounted pricing available from enrolled contractors—**up to 75% off project costs**.
- Projects that save energy (gas or electricity)* are eligible for incentives when you work with a 3C-REN enrolled contractor.
- The actual incentive depends on how much energy the project will save.

*not solar

3C-REN Eligible Upgrades: Heat Pumps & Beyond

3C REN

3C-REN Incentives for Heat Pump Projects etc.

Incentives Based on Projected Energy Savings

Heat Pump HVAC System

- **$2,300** average (but big variance)

Heat Pump Water Heater

- **$1,250** average

All energy efficiency projects in 2023

- Market-rate customer incentives were clustered in the $500-$5,000 range

Hard to Reach customers receive 3x the incentive dollars from 3C-REN

Hard to Reach Customers: 3-4x the Incentive $$$

SB+SLO Counties:

Homeowners that meet **one** of these criteria: live in mobile homes, don't speak English as their first language, OR are on CARE/FERA rates.

Ventura County:

Homeowners that meet **two** of these criteria: live in mobile home, don't speak English as their first language, are on CARE/FERA rates, or live in an SB 535 designated DAC.

How to Participate with 3C-REN

HOME ENERGY SAVINGS

Single-Family Incentive Eligibility Criteria

- Single-family residential customer
- Live within the 3C-REN territory
- Receive Investor-Owned Utility (IOU) service (gas/electricity)
- **Incentives must be accessed through contractors enrolled with 3C-REN**

www.3c-ren.org/for-residents

IRA: Inflation Reduction Act

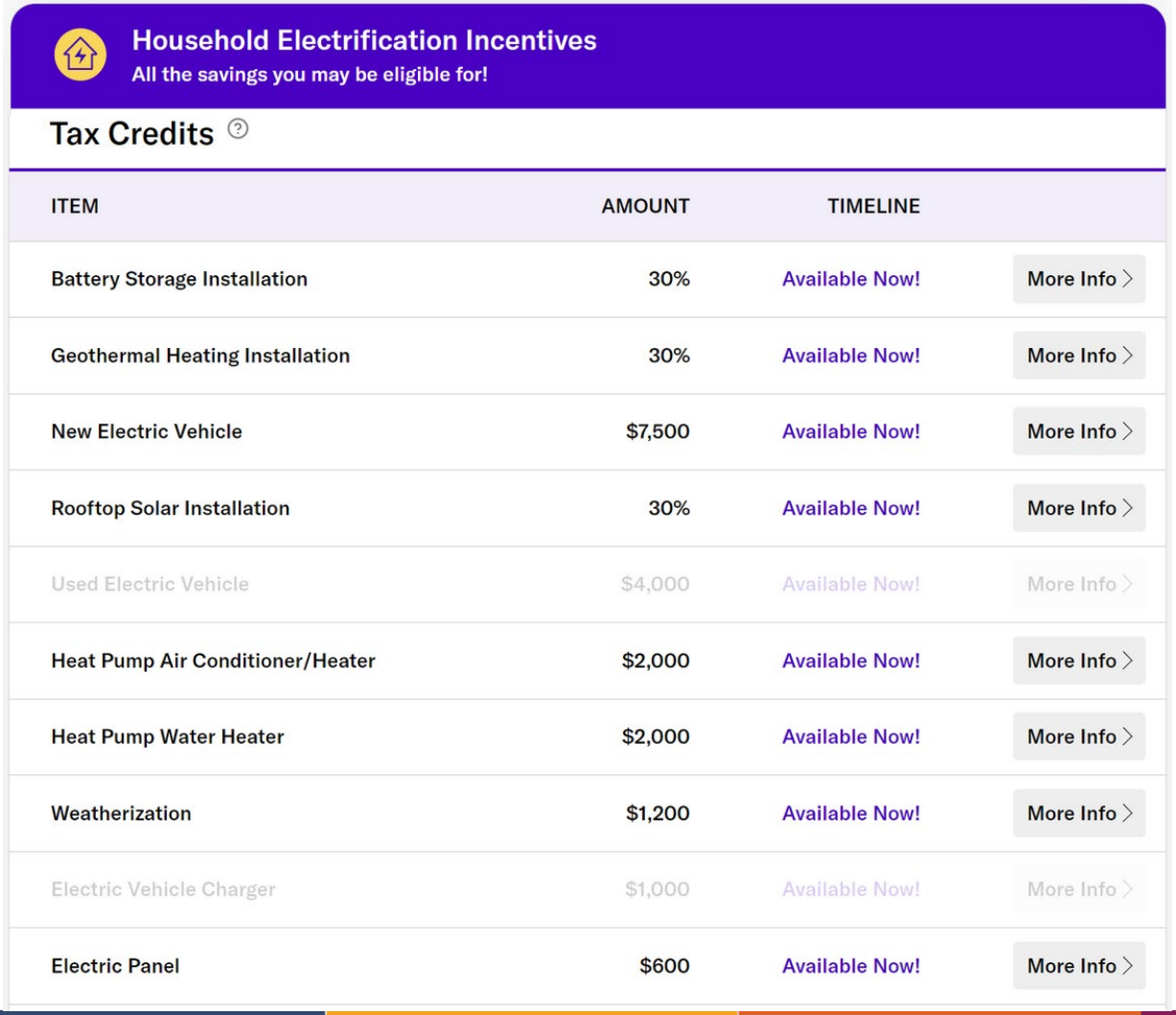
- Largest clean-energy investment America has ever made to make the transition to clean energy and decarbonizing our lives.
- Available now: Federal tax credits for household electrification.
- Available in 2024 or 2025: California Energy Commision plans to focus rebates and incentives on low-income populations.

Energy Efficient Home Improvement Tax Credit

- **30% tax credit for heat pump** project (space heating and water heaters), capped at $2,000 per year.
- **30% tax credit for electrical panel** upgrade if done in conjunction with a heat pump project, up to $600.
- **30% tax credit for weatherization** purchases such as insulation, air sealing, door and window upgrades, and energy audits, capped at $150 to $1,200 per year.
- Credits of 30% will be based on the actual money spent on the project after other incentives are applied.
- The overall limit for an efficiency tax credit in one year is $3,200.
- Credits reset each tax year, effectively becoming available again for additional projects.
- IRS Fact Sheet

Rewiring America IRA Calculator*

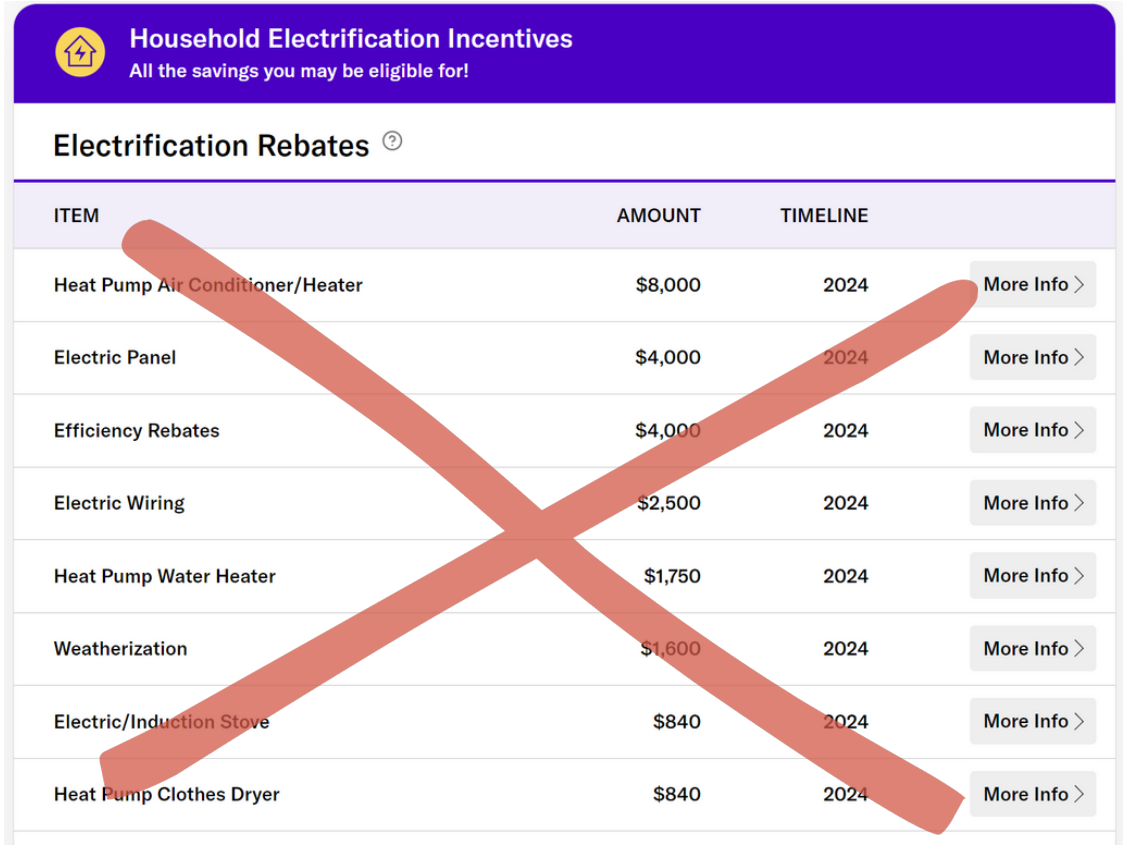
www.rewiringamerica.org/app/ira-calculator



Household Electrification Incentives
All the savings you may be eligible for!

Tax Credits

ITEM	AMOUNT	TIMELINE	
Battery Storage Installation	30%	Available Now!	More Info
Geothermal Heating Installation	30%	Available Now!	More Info
New Electric Vehicle	$7,500	Available Now!	More Info
Rooftop Solar Installation	30%	Available Now!	More Info
Used Electric Vehicle	$4,000	Available Now!	More Info
Heat Pump Air Conditioner/Heater	$2,000	Available Now!	More Info
Heat Pump Water Heater	$2,000	Available Now!	More Info
Weatherization	$1,200	Available Now!	More Info
Electric Vehicle Charger	$1,000	Available Now!	More Info
Electric Panel	$600	Available Now!	More Info



Household Electrification Incentives
All the savings you may be eligible for!

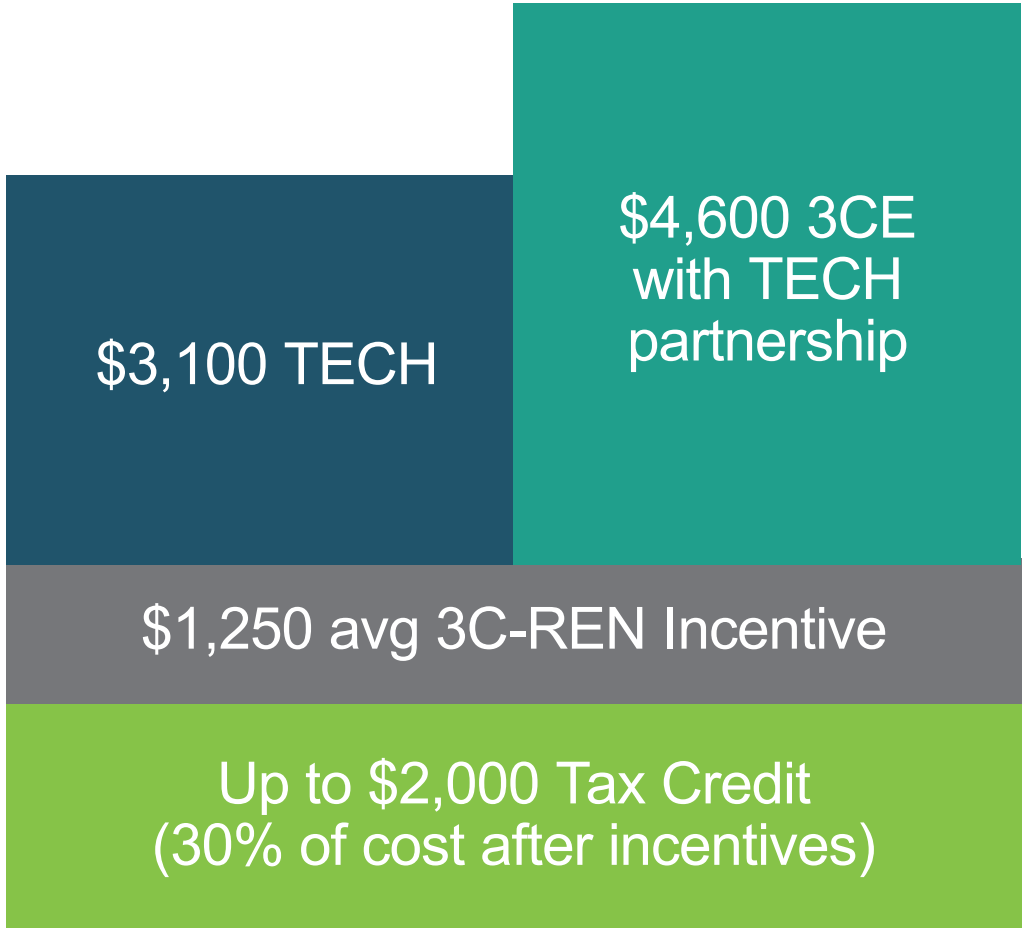
Electrification Rebates

ITEM	AMOUNT	TIMELINE	
Heat Pump Air Conditioner/Heater	$8,000	2024	More Info
Electric Panel	$4,000	2024	More Info
Efficiency Rebates	$4,000	2024	More Info
Electric Wiring	$2,500	2024	More Info
Heat Pump Water Heater	$1,750	2024	More Info
Weatherization	$1,600	2024	More Info
Electric/Induction Stove	$840	2024	More Info
Heat Pump Clothes Dryer	$840	2024	More Info

*Credits are relevant for California residents. Rebates aren't programmed yet—don't be misled.

So, how do all of these stack?

Example Project:
Heat Pump Water Heater <55 Gallons



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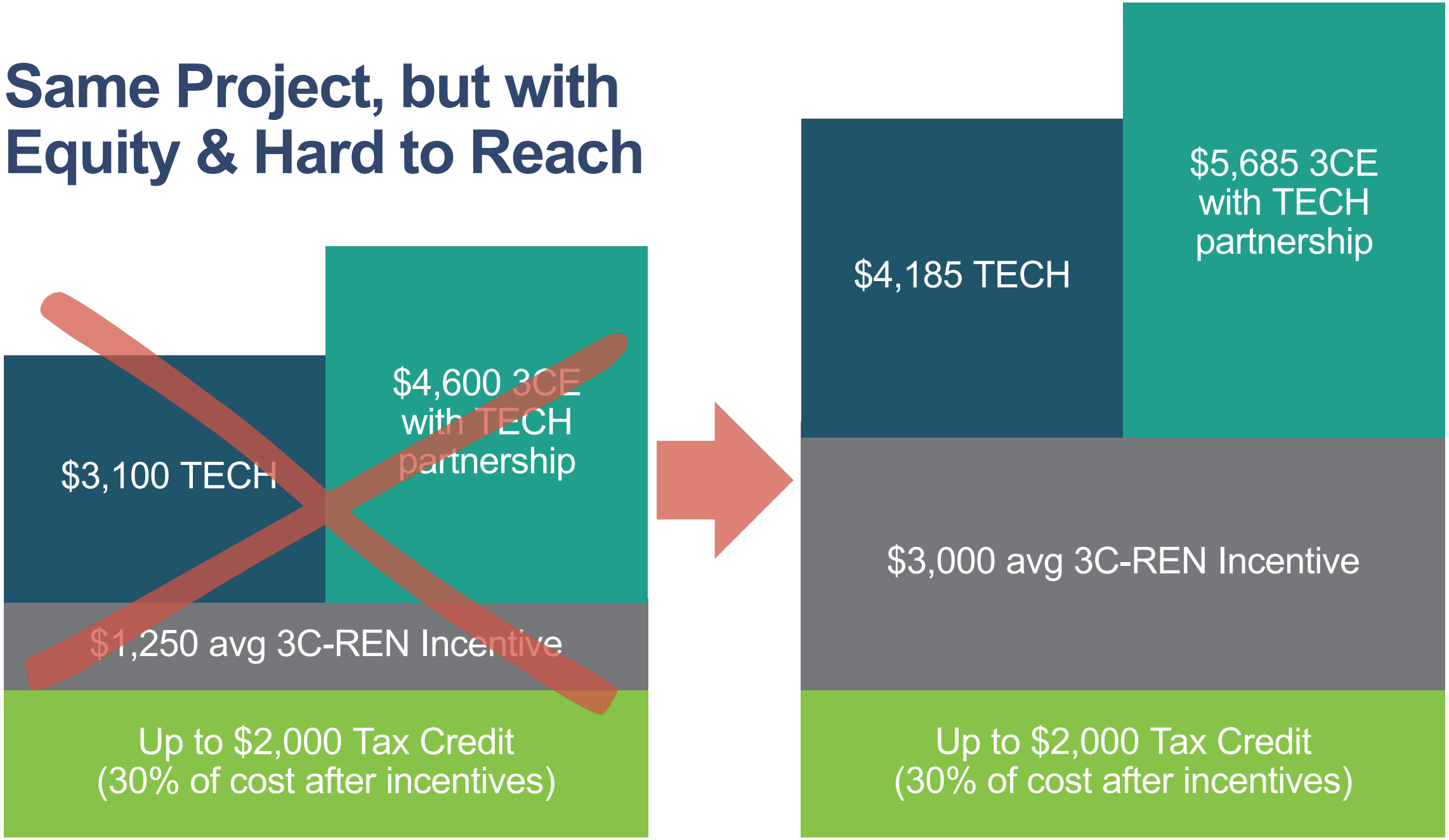
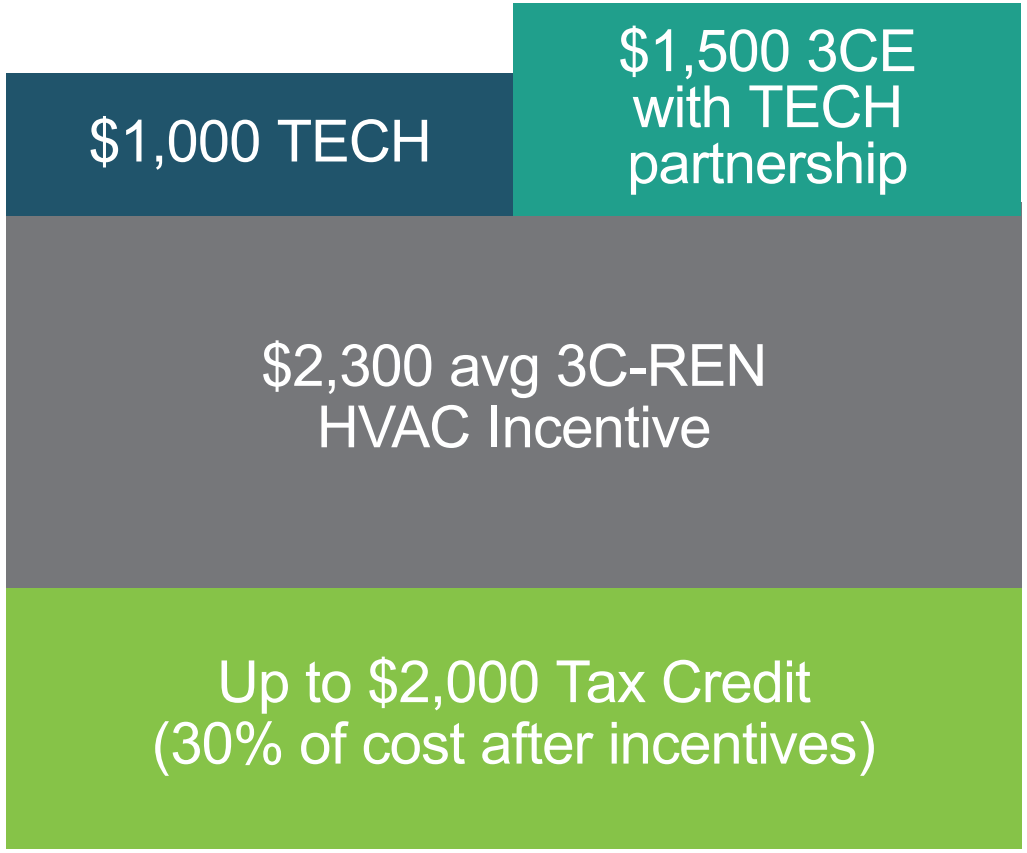
3C-REN HOME ENERGY SAVINGS

Inflation Reduction Act (IRA)

Same Project, but with Equity & Hard to Reach



Example:
Heat Pump HVAC Project



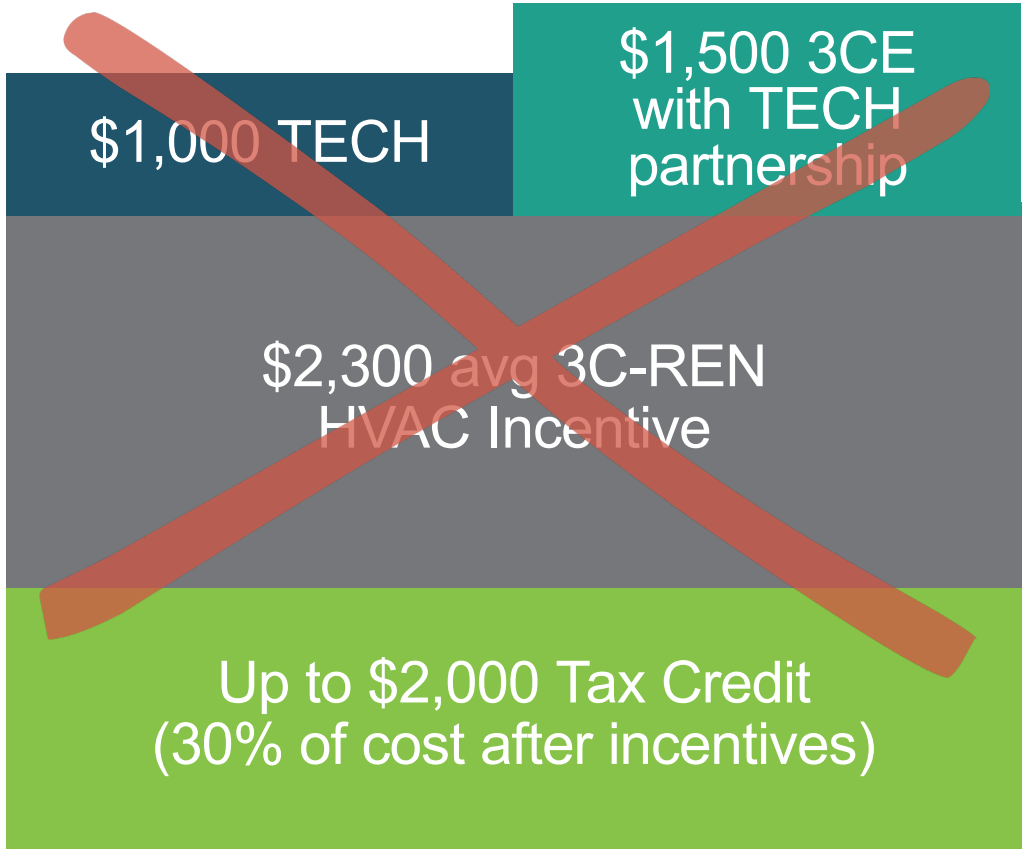
Central Coast Community Energy

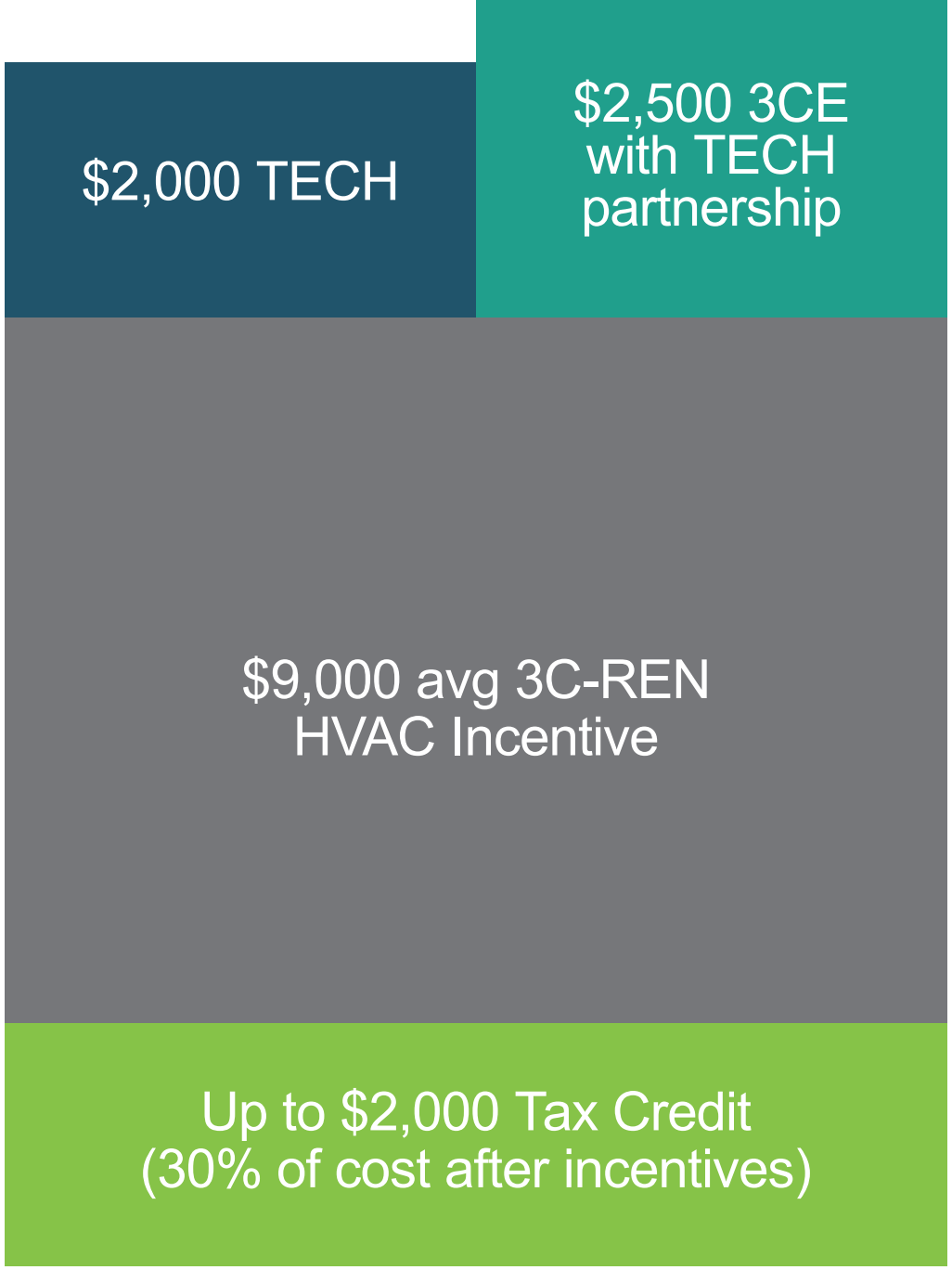
TECH CLEAN CALIFORNIA

3C-REN HOME ENERGY SAVINGS

Inflation Reduction Act (IRA)

Same Project, but with Equity & Hard to Reach





How will I remember and track ALL THESE INCENTIVES?!? 😯

Two incentive finders will connect you to everything I've discussed today such as:

- 3CE, 3C-REN and TECH incentives
- IRA federal tax credits
- Finding an enrolled contractor
- Additional rebates not discussed today
- Solar, EV and e-bike programs

And the results will be tailored based on your zip code!

THE SWITCH IS ON

3C-REN

Incentive Finder URLs: https://incentives.switchison.org and www.3c-ren.org/programs-incentives

Thank you!

For more info:
3c-ren.org

For questions:
info@3c-ren.org

3C REN

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

AeroTherm Series®
Heat Pump Water Heater

Gregg Holladay

Business Development Manager

gholladay@BradfordWhite.com

bradfordwhite.com

502-774-0773

*Bradford White is an American company with its manufacturing facilities located in the United States of America. Products made by Bradford White are manufactured in the United States using the finest raw materials and components from around the world to deliver the highest quality and value to our customers.

BRADFORD WHITE WATER HEATERS

14

Today's Presenter – Gregg Holladay

Gregg works to educate architects, builders, and the plumbing/HVAC trade on the benefits of ENERGY STAR® certified heat pump water heaters, including Bradford White's own AeroTherm® Series.

Before joining the Bradford White team, Gregg spent 32 years with General Electric (GE) where he introduced GeoSpring™, the first ENERGY STAR® electric heat pump water heater, to the US market.

As a pioneer in this industry, Gregg is considered an expert speaker on this topic conducting countless numbers of webinars and advising utilities across the country on integration best practices.

Gregg Holladay
Business Development Manager
Specialty Markets
Bradford White Corporation

BRADFORD WHITE
WATER HEATERS

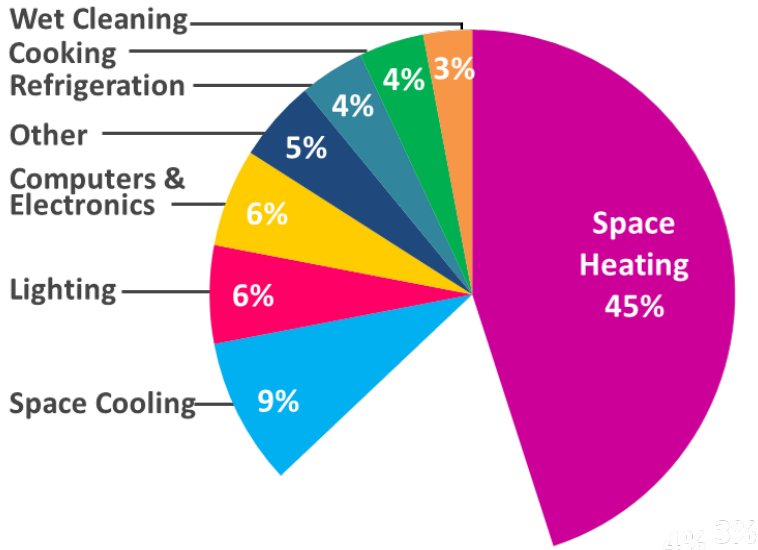
Where it began and why…

- **Energy Star® begins – 1992**
  - Goal to reduce greenhouse gas emissions
  - Computers/monitors first rated products

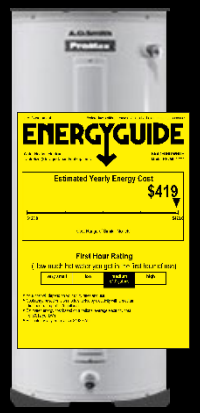
- **HVAC products 1st rated – 1995**
  - Highest energy user in home

- **Water heaters 1st rated – 2009**
  - 2nd highest energy user in home
  - GE GeoSpring 1st listed electric water heater ever!
  - HPWH's use 3,000 less kWh's than standard electric
  - 1st Target – all electric homes (50% of market)

Water heating is the 2ND LARGEST expense in U.S. homes, accounting for 14-18% of homes utility bills



$400-600
The amount of money the average household spends on water heating EACH YEAR



ENERGY STAR

Learning to focus on the big picture will help you keep things in a proper perspective.

Roy T. Bennett

- The market is changing
- We either move forward or get left behind
- Heat pump water heaters make sense in ***every*** market
- They pay for themselves, being Green is a bonus!

QuotesLyfe

ENERGY STAR

GET HEAT PUMPED UP!™

Practical Questions To Answer

- Is a heat pump water heater appropriate for my home?
- Are they better than gas water heaters?
  - Efficiency
  - Cost of operation
  - Recovery
- Should I wait until my gas water heater fails to upgrade?
- Will I need electrical work done?
- How much do they cost to install—and how will my bills change?
- Who can install heat pump water heaters?
-
- Will I run out of hot water?
- Are they reliable?

BRADFORD WHITE®
WATER HEATERS

How You Heat Your Water Matters™

Unitized HPWH's are ENERGY STAR® certified with up to an impressive

4.07 UEF

Lower Energy usage significantly lessens impact on the environment

Uses a renewable energy resource and creates NO green house gasses

No carbon emissions *and* Pays For Itself!

*Payback = Return on total investment of product including installation

Above UEF

4.0 UEF

3.0 UEF

2.0 UEF

1.0 UEF

Below

3.64

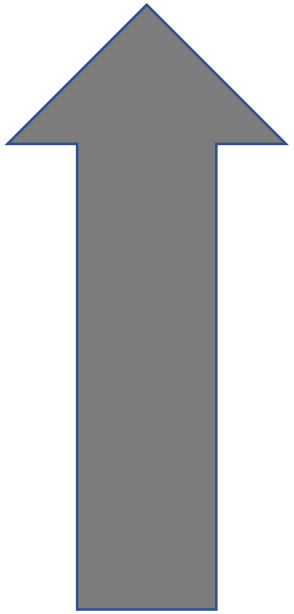
- Provides over $3.50 of hot water for every dollar spent
- Saves about $300 a year over standard electric water heater
- 10-year limited warranty

Payback above the line

.82-.97

.93

.60



BRADFORD WHITE® WATER HEATERS

Heat Pump Water Heaters work By – both moving *and* creating heat

Heat pump

- Evaporator draws in ambient heat using a fan
- Evaporator absorbs the heat, and the compressor increases the temperature and pressure of the 134A refrigerant

Moving = 550 watts power used
Creating = 4500 watts power used

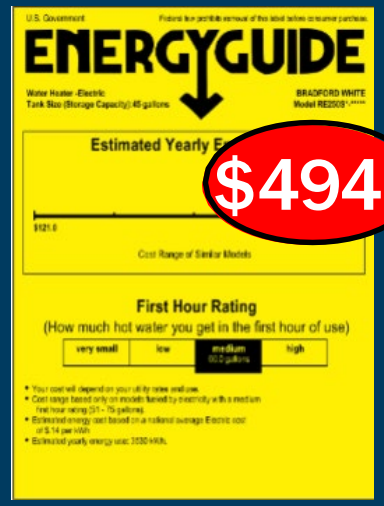
External condenser coils

- Heated refrigerant flows through the coils to heat water in the tank
- Coils are external and surround the porcelain lined tank to prevent corrosion and calcium build-up
- Can take tank temp up to 140 degrees

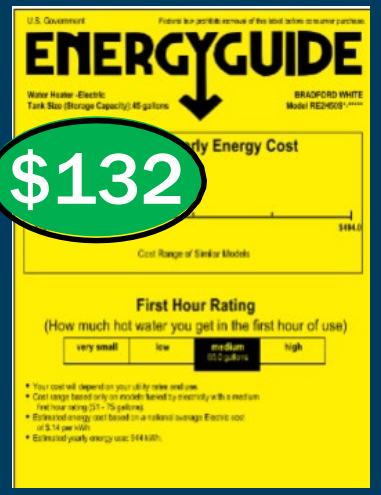
Tank and electric elements

The heat pump comes on first (550W) to recover the tank. If needed, ti will add the upper element (4000w) to simultaneously heat the tank from the top down during prolonged use.

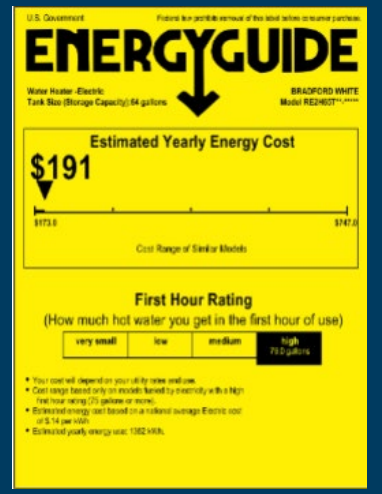
BRADFORD WHITE® WATER HEATERS



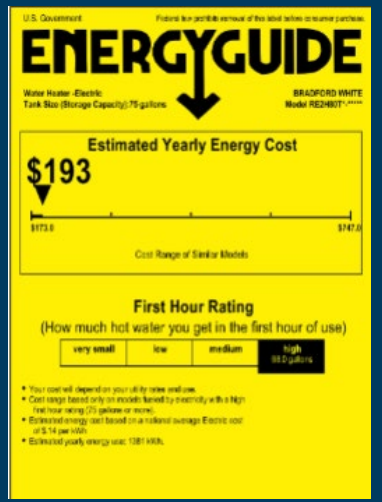
Standard Electric .93 UEF
50 Gallon



AeroTherm® 3.43 UEF
50 Gallon

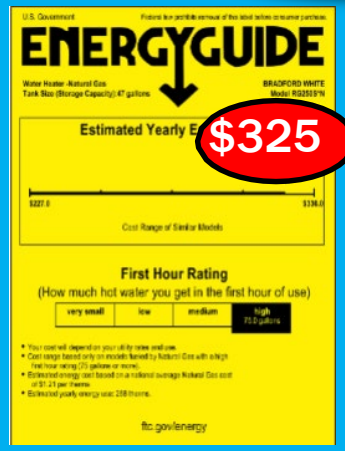


AeroTherm® 3.64 UEF
65 Gallon

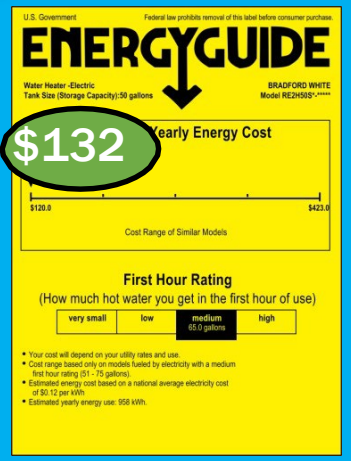


AeroTherm® 3.59 UEF
80 Gallon

Saves $362 every year!

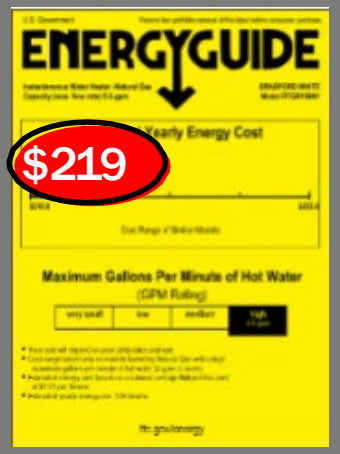


Standard gas tank .63 UEF

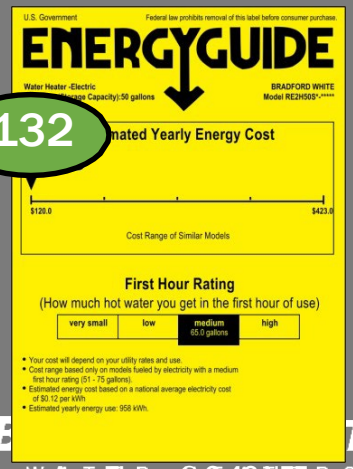


AeroTherm® 3.43 UEF

Saves $193 Per Year vs. Gas!



Gas tankless .95 UEF



AeroTherm® 3.43 UEF

Saves $87 Per Year vs. Tankless!

Key Things To Remember

- Read the manufacturers installation instructions that come with the water heater for space/clearances required/recommended/electrical and start up sequence (dry fire using HP only)

- Gas and Electric water heaters size differently, not a 1:1 switch out. Consult manufacturers web site for sizing help

- Condensate removal is about 2 quarts per day of non-acid water

- Energy Guides are based on Hybrid operating mode, 68 degrees ambient air temp at 14 cents per kwh – National Average

GET HEAT PUMPED UP!™

ENERGY STAR

Rheem

A.O. Smith

SANCO2

nyle water heating systems

American Standard WATER HEATERS

BRADFORD WHITE WATER HEATERS

Heat Pump Water Heaters Tax Credit

Information updated 12/30/2022

Subscribe to ENERGY STAR's Newsletter for updates on tax credits for energy efficiency and other ways to save energy and money at home.

See tax credits for 2022 and previous years.

This tax credit is effective for products purchased and installed between January 1, 2023, and December 31, 2032.

You can claim:

30%
of project cost

$2,000
maximum amount credited

What products are eligible?

Heat pump water heaters that have earned the ENERGY STAR are eligible for this credit.

Note: Under the tax code, eligible equipment must "meet or exceed the highest efficiency tier (not including any advanced tier) established by the Consortium for Energy Efficiency which is in effect as of the beginning of the calendar year." The eligibility described above is consistent with this requirement.

Annual Limits on Energy Efficient Home Improvement Tax Credits

Battery Storage Technology
Biomass Stoves/Boilers
Central Air Conditioners
Electric Panel Upgrade
Electric Vehicles
Exterior Doors
Fuel Cells (Residential Fuel Cell and Microturbine System)
Furnaces (Natural Gas, Oil)
Geothermal Heat Pumps
Heat Pump Water Heaters
Home Energy Audit
Hot Water Boilers (Natural Gas, Propane, Oil)
Insulation
Small Wind Turbines (Residential)
Solar Energy Systems
Water Heaters (Natural

What products are eligible?

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Annual Limits on Energy Efficient Home Improvement Tax Credits

In addition to limits on the amount of credit you can claim for any particular equipment installation or home improvement, there are annual aggregate limits. The overall total limit for an efficiency tax credit in one year is $3,200. This breaks down to a total limit of $1,200 for any combination of home envelope improvements (windows/doors/skylights, insulation, electrical) plus furnaces, boilers and central air conditioners. Any combination of heat pumps, heat pump water heaters and biomass stoves/boilers are subject to an annual total limit of $2,000. (Note: ENERGY STAR certified geothermal heat pumps are eligible for a separate tax credit and not counted against these limits.)

Find Eligible Products

Find products that are eligible for this tax credit.

Rebate Finder

Our partners sponsor rebates on certified products.

ENERGY STAR Home Upgrade

Water heater upgrades qualify for this tax credit.

Terminology – Good to know!

Connected with brand specific APP– Download the brand specific APP to monitor energy usage, change operation mode, get fault alerts, change temp, assist in service etc.

CTA-2045 – Reference to the Modular Communications Interface supplied with/on heat pump water heaters for the purpose of Energy Management with homeowner consent, by a utility using their communication device in the port (Hardware)

JA13 – The ability of a heat pump water heater to respond to Demand Flexibility Commands from a utility for the purpose of daily load shifting, during peak times or "loading up" the tank during off peak, with the purpose of user bill reductions, maximized solar self utilization, and grid harmonization (Software)

Terminology – Good to Understand!

Heat Pump Water Heater – AKA, HPWH, Hybrid Heat Pump Water Heater, or Hybrid Electric Water heater. Two types: 240v standard, and 120v for gas replacement without wiring update – AO Smith, Bradford White, and Rheem

UEF – Uniform Energy Factor (UEF): The newest measure of water heater overall efficiency. The higher the UEF value is, the more efficient the water heater. UEF is determined by the Department of Energy's test method outlined in 10 CFR Part 130, Subpart B, Appendix E.

Unitized HPWH – One-piece, same look, ready to install, no HVAC license

Split HPWH – Two pieces, Tank inside, HP outside. Split with tank inside or by adding on a HP inside.

Residential Heat Pump Water Heater Types

Hybrid = Both moves and creates Heat

Integrated 240 Hybrid Electric – ENERGY STAR

New construction and replacement

Moves Heat

Integrated 120v
Heat Pump Only
ENERGY STAR

*Gas replacement only

Moves Heat

Split System Co2

New construction and replacement

*Commercial product may be integrated or split system type
*Residential can be used in multi-family or light commercial

Best Locations – HPWH's need 700cf air

Venting - Rarely Used!

- **Basement**
  - Non-conditioned space, inside a conditioned home
  - Heat in basement comes from the **FREE** warm earth outside the walls (50º-60º)
- **Laundry Room**
  - Warm and damp due to dryer
  - May be next to HVAC
  - May be in closet with full louvered door breathing into 700cf space

Sound
All are 45-49dBA

- **Garage – Perfect!**
  - Non-conditioned space that stays above freezing
  - Less efficient in winter, more efficient in summer – should average out to shown UEF listed by manufacturer
  - Easy to run condensate line
- **Closet – Louvered door to breath**
  - Most recommend 36" closet for adequate space
  - Need full louvered door for proper air flow

Properly Size The Tank

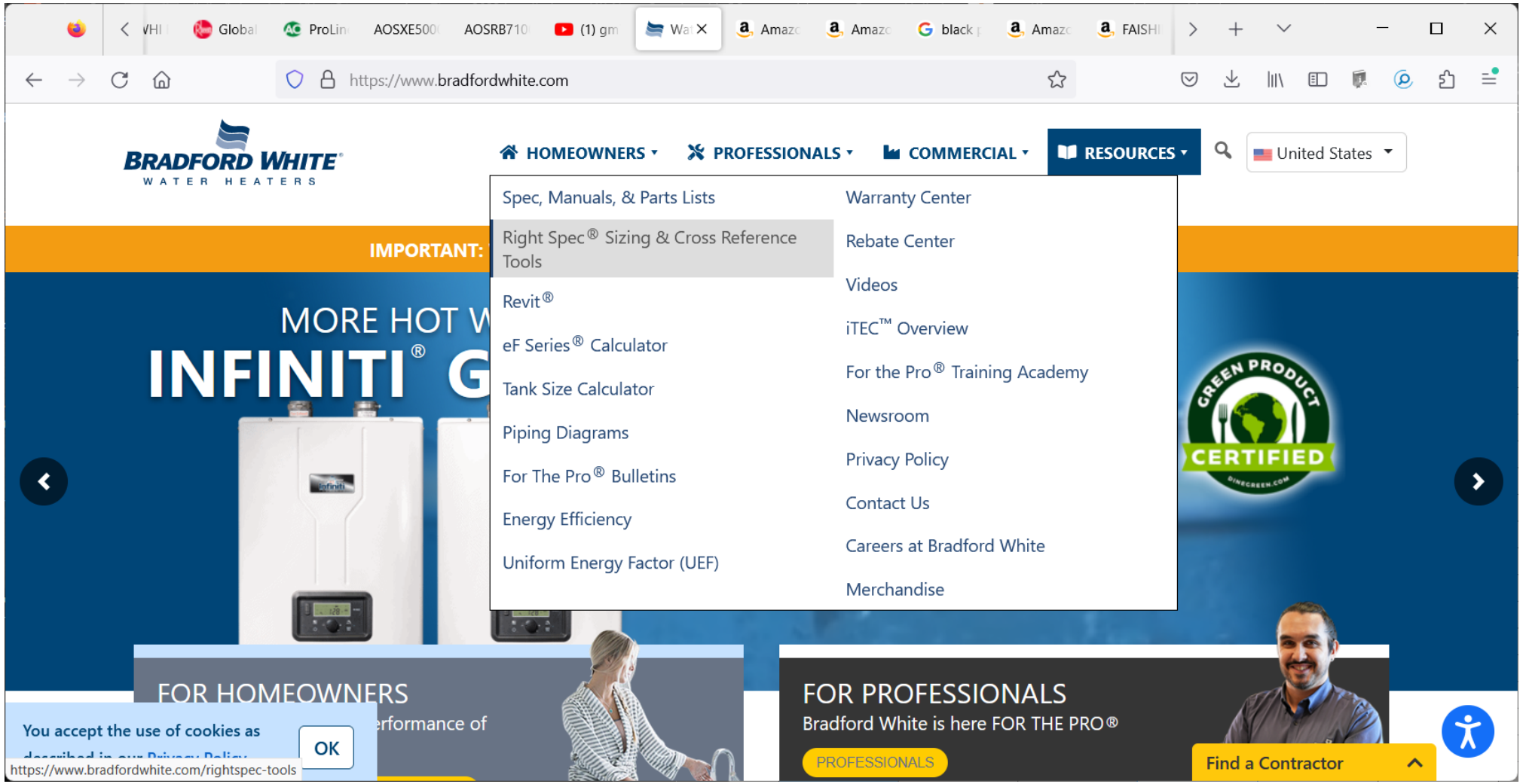
Gas water heaters have a higher First Hour Rating (FHR) so a larger electric tank may be needed to compensate. When HPWHs are sized properly, they will perform just as well

HPWH's are standard electric water heaters *with* a heat pump – follow standard electric sizing protocol using the manufacturers sizing tool

Expect the manufacturer to educate you on proper installation/service

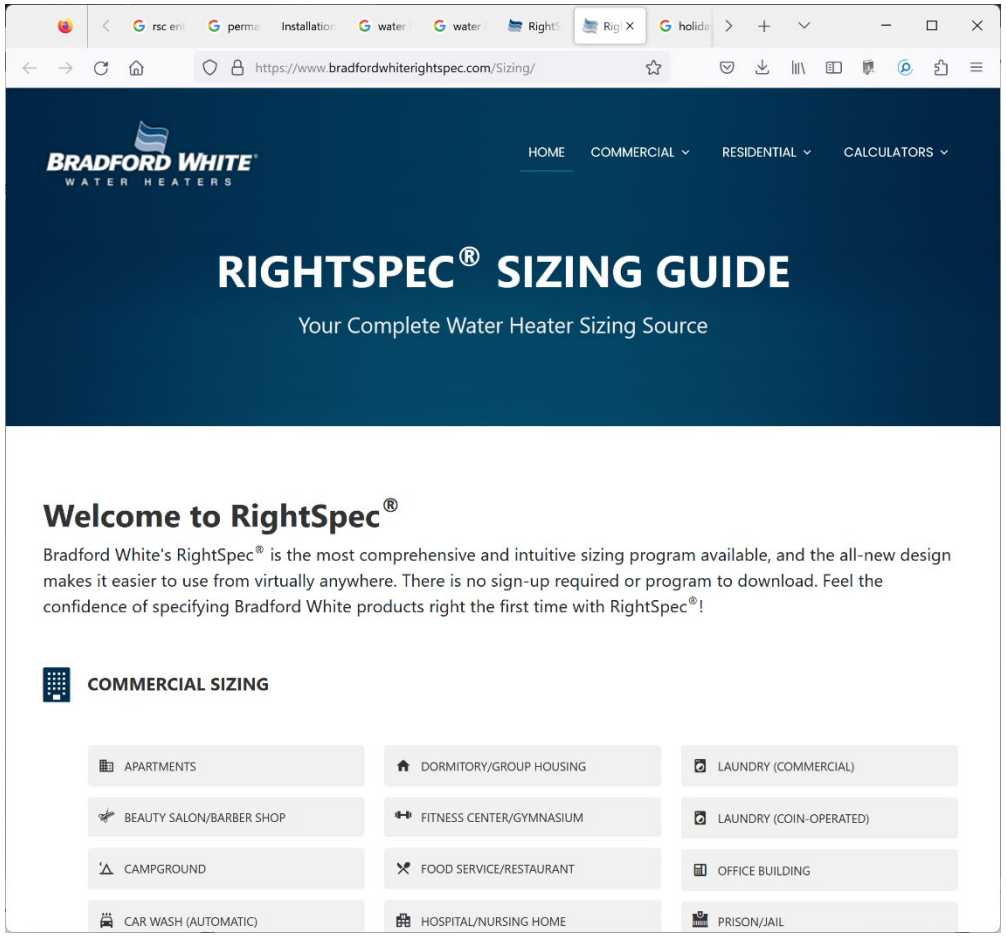
Properly Size The Tank

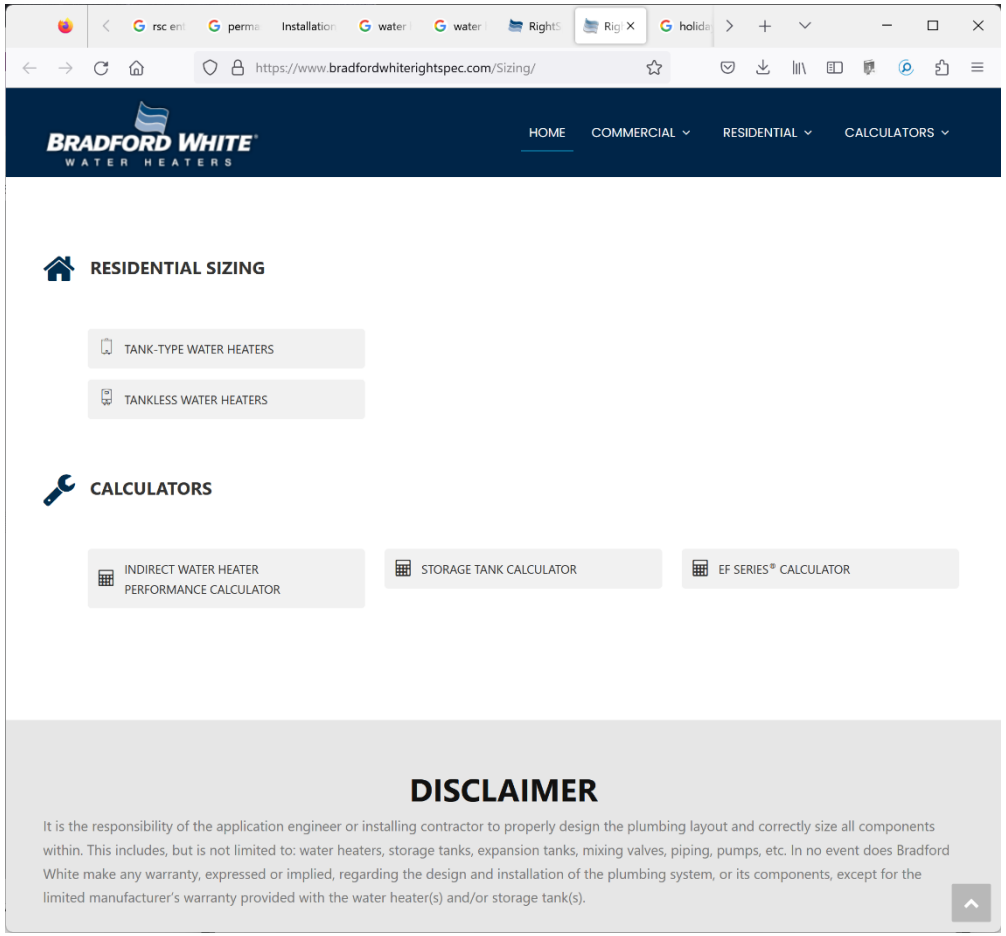
https://www.bradfordwhiterightspec.com/Sizing/



Properly Size The Tank

https://www.bradfordwhiterightspec.com/Sizing/





Properly Size The Tank

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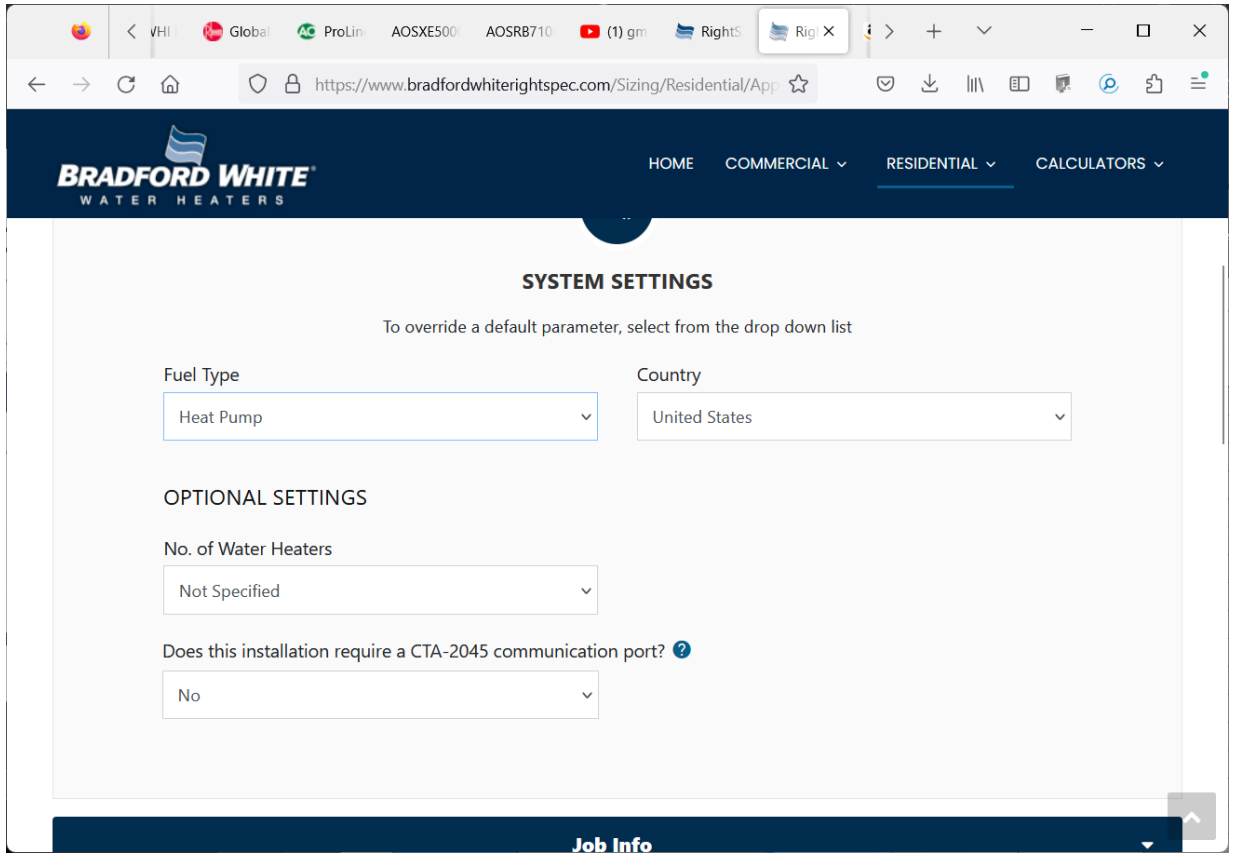

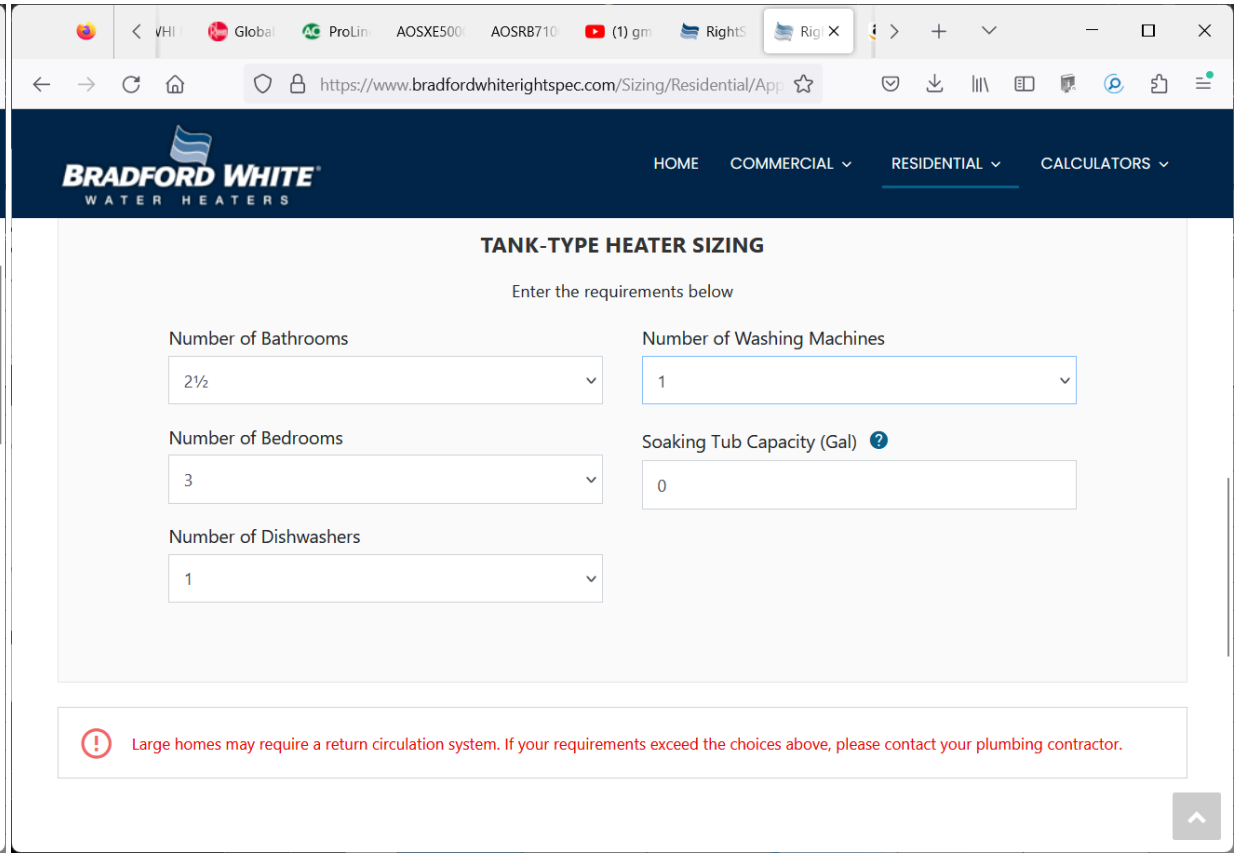

Properly Size The Tank

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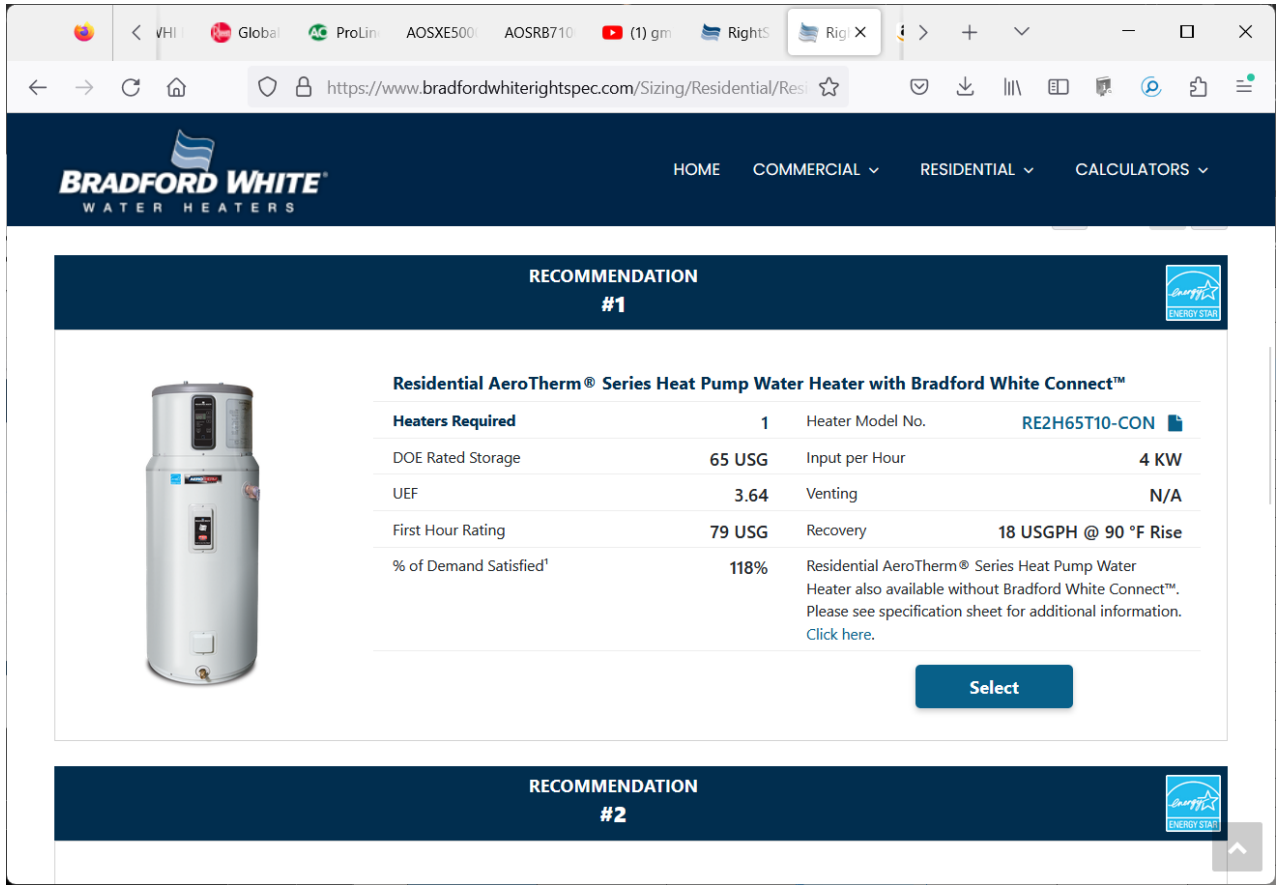
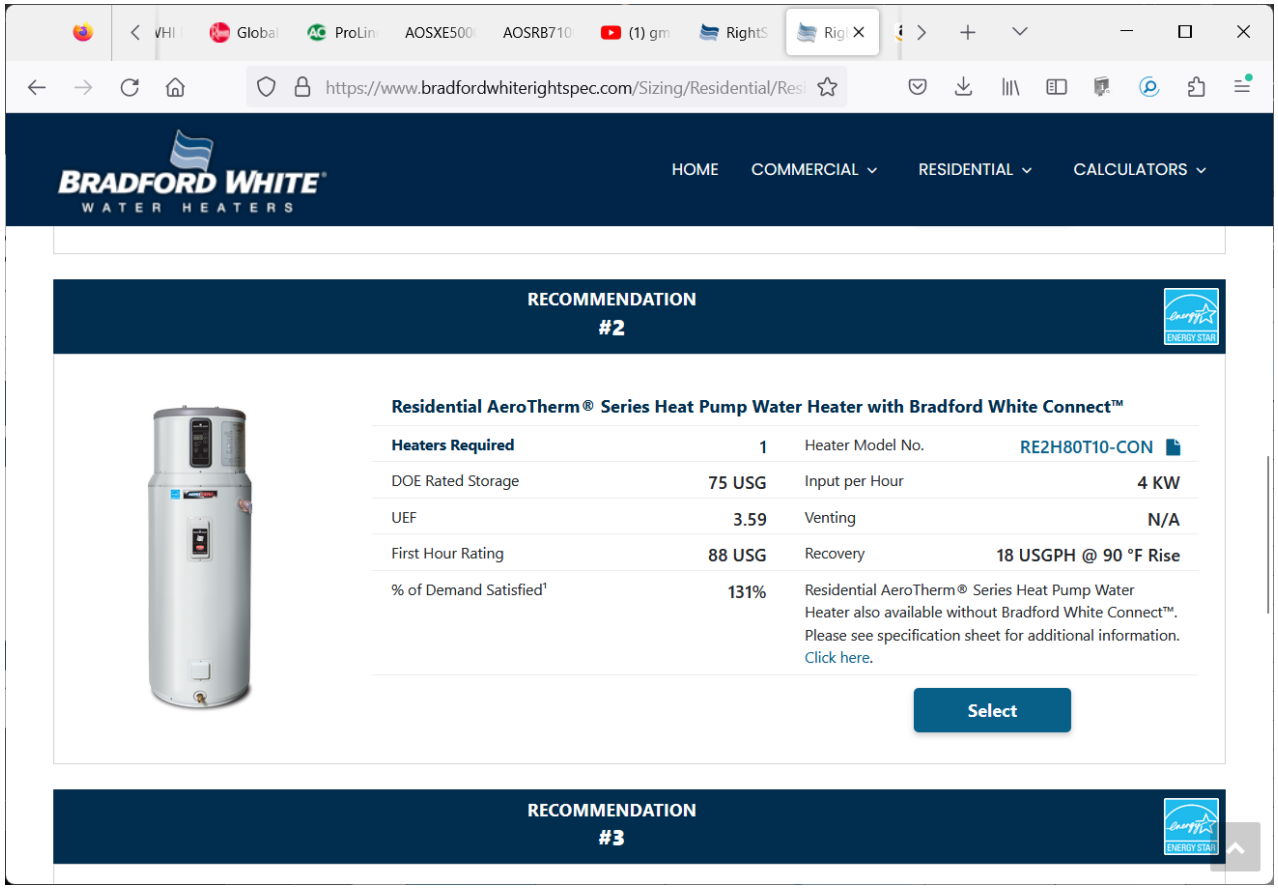
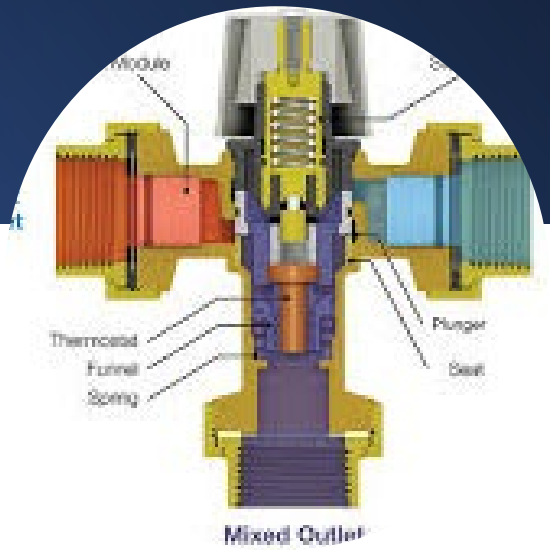




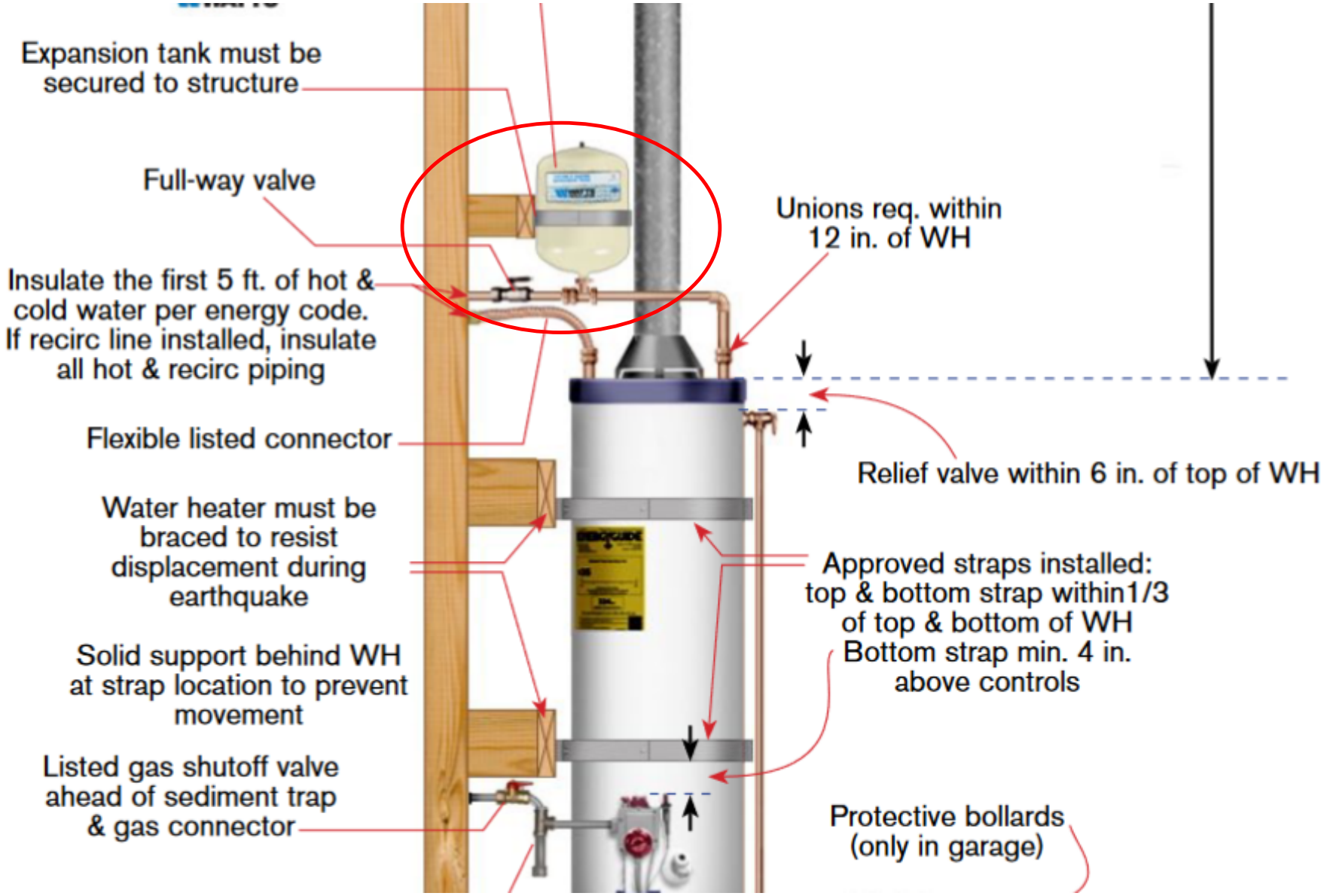
Mixing Valves/Recirculation Pumps

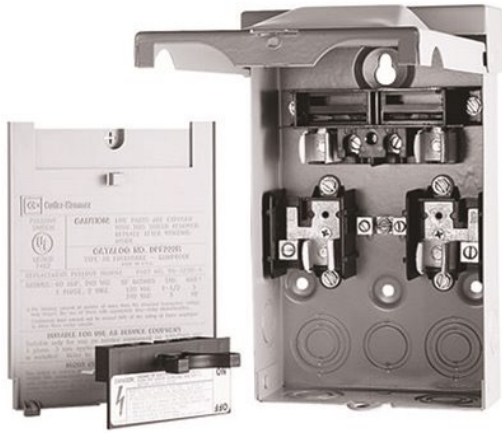


ASSE 1017 required

- Mixing Valves allow the tank temperature to be elevated to 140 degrees so less hot water is used
- Recirculation Pump – ONLY use a Smart Recirculation system – Proximity sensor or timer, not an aqua stat
- Expansion tanks should be used on a closed loop system

Expansion Tank Installation – Same





30 Amp Disconnect

TANK ONLY Leak Detection VS *Whole Home*

Tank only Limited leak detection systems:

- **Water heater only leak detection with floor sensor**
  - Alerts homeowner to investigate via water heater app to act immediately
  - No shut off – homeowner must act immediately
- **Water heater only leak detection with floor sensors *PLUS* incoming water shut off at water heater**
  - Alerts homeowner to investigate via water heater app to act immediately
  - Shuts off cold water supply at the tank

FloodMaster RS-094-MK4 – Example of Tank Only leak detection/shut off

- If a leak is detected, the RS-094-MK4 will shut off the water going to the water tank. This will stop the continuous flow of water from the water supply to the tank.
  However, all or some of the water that is already in the tank may still leak out onto the floor
  - Will not work if someone opens a faucet – can allow a burp to break the siphon

Example Only

Whole Home Unlimited leak detection with Shut off – Best Option!

- Whole home shut off detects ALL water leaks and acts to prevent – multiple sensors
- Can detect small, continuous leaks anywhere and shuts down *whole home* water inlet
- Alerts homeowner via app

Is recommended by home insurance, plumbing and security professionals

Qualifies for insurance premium discounts from many companies

BRADFORD WHITE®
WATER HEATERS

Heat Pump Water Heater Choices

Rheem
Ruud
Richmond

Professional Prestige ProTerra
Performance Platinum Pro Terra
Performance Platinum Series
Professional Prestige Series

- Side Connections – Anti-siphon valve required
- Vent on front
- UEF 3.55-4.07 (80g model only)
- FHR - 67
- 10-Year Limited Warranty
- Retail/Wholesale
- Serviceability - Electrical
- Mexico

*See website for full feature listing

Bradford White
Wholesale Only

- Top Connections
- Vent Capable - Top
- UEF 3.43-3.64
- FHR - 65
- 10 Year Limited Warranty
- Wholesale ONLY
- Serviceability - FULL
- Middleville, MI

—BRADFORD WHITE IS—

AMERICAN STRONG

AO Smith
American
Craftmaster
Lochinvar
Reliance
State
Whirlpool

- Top/Side Connections – Anti-siphon valve required
- Vent Capable - Top
- UEF 3.42-4.02 (66g model only)
- FHR - 66
- 10 Year Limited Warranty
- Retail/Wholesale
- Serviceability - Electrical
- Mexico

*See website for full feature listing

BRADFORD WHITE WATER HEATERS

*Based on DOE test procedure and comparison of a standard electric tank water heater using 3493 kWh per year vs. the AeroTherm® heat pump water heater using 1003 kWh per year and national average electricity rate of 12 cents per kWh.

Where are they made?

Mexico, China, Germany, and Middleville, MI below (one manufacturer only)

BRADFORD WHITE®
WATER HEATERS

Installation Instructions Document found On Every Water Heater

Recommended Clearances

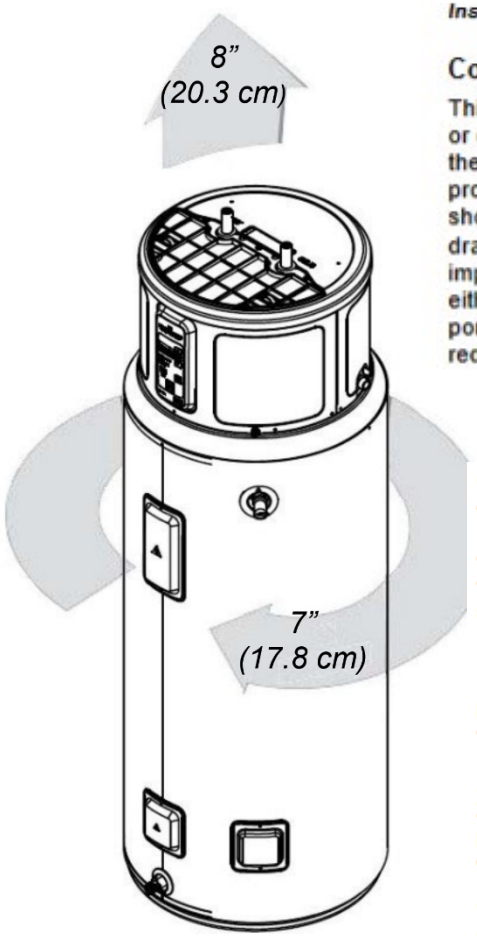
NOTE: Installations in a confined space, or installations where the recommended service clearances are not met, will lead to higher power consumption (increased use of resistance heating elements and/or heat pump efficiency reduction).

It is recommended to have a 7” (17.5 cm) clearance between any object and the rear and right side of the water heater in the event service is needed. A minimum 8” (20.3 cm) clearance above the water heater to remove the filter for cleaning and for service access, and clear access to the front of the water heater, is recommended. Installations that require less than 7” (17.5 cm) clearance on the right side or rear of the water heater for earthquake straps are also acceptable (see *Minimum Required Clearances* section below for more information). **In these cases, it is recommended to provide additional clearance on the opposite side of the unit to allow for service access.** The hot and cold water plumbing and electrical connections must not interfere with the removal of the filter.

If a separate ducting kit is purchased (refer to www.bradfordwhite.com for ducting kit part number), additional space is required above and to the rear of the water heater for installation. Consult the ducting kit manual for specific instructions. See www.bradfordwhite.com for details.

The clearances shown are recommended for optimal performance (best possible efficiency) as well as adequate service room. Reducing these clearances may impact the overall performance compared to what is displayed on the water heater. A ducting kit may need to be used – refer to the Service Manual or ducting kit instructions for installation information.

Insufficient air exchange will result in increased energy consumption levels.

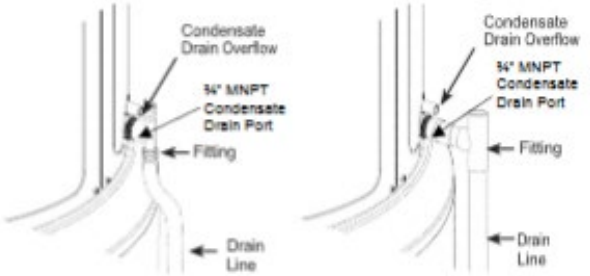


Model appearance may vary

Installation Instructions cont.-

Condensate Drain Connection

This unit has a condensate drain; therefore, a floor or other drain no higher than 36 in (91.4 cm) above the floor must be available. It must be in close proximity to the water heater to allow for the shortest possible drain line with minimal turns. The drain must meet state and local codes. It is important to install a ¾” FNPT fitting suitable for either rigid or flexible drain line to the primary drain port coming off the side of the unit. Diameter reductions from a ¾” drain line are discouraged.



(Typical Installations)
Flexible or rigid ¾” drain line and associated ¾” FNPT fitting

“F11” Fault Code During Installation: If the unit is powered on without a full tank, the error code “F11” will appear. Turn the power OFF, finish filling the tank with water, then turn on the power back ON.
NOTE: The Dry Tank Detection feature on the tank is for the aid of the installer and should **NOT** be used as the primary control to prevent operation with an empty or partially filled tank. Power should **NEVER** be applied to the water heater until the installer has verified that the tank is filled, and all air has been purged from the system.

Electrical Notices: Do **NOT** incorrectly wire electrical connections. 240 VAC or 208 VAC must be applied across L1 and L2 wires. Failure to do so will void the warranty and can result in 120 VAC applied to water heater, which may damage the compressor or other electrical components. If the 4-conductor wire is supplied to the water heater, then cap the neutral, and connect the remaining wires.
NOTE: Regarding Utility Power-Management Devices (sometimes called Peak Load Reduction Switches) – Some power-management switching devices or even some basic timer switches exist that reduce voltage from 240 VAC to 120 VAC during high-electricity-demand periods. These devices must be removed from the circuit providing power to the water heater because of the potential water heater damage noted above. Switching devices which cut power from 240 VAC to 0 VAC on a periodic basis is acceptable.

“bAd line” Fault Code During Installation: If a “bAd line” is shown on the display, the water heater is not receiving the correct voltage as a result of incorrect wiring. To correct this fault, turn the power OFF to the water heater, correct the wiring issue, then turn the power back ON.

BRADFORD WHITE®
WATER HEATERS

Installation Instructions Document found On Every Water Heater

What to Expect for "Normal Startup" in Hybrid Mode

After the unit has been installed, with all electrical and water connections secure and checked, then the unit should be filled with water (vent tank by opening a hot water faucet somewhere in home to allow tank to fully fill with water). Once the tank is full and power is energized, you may experience the following:

Elapsed Time	Water Heater Actions	Comments
0 to 2 minutes	Unit will go through self-check and display countdown. Fan will turn on after 1 minute.	This 2-minute off-time prevents compressor damage. A clicking noise may be heard during startup.
2 to 22 minutes	Compressor turns on. Fan continues to run.	This 20-minute period is used to ensure the tank is full of water (dry-fire prevention algorithm).
22 minutes and beyond	Compressor turns off (fan will run for 20 minutes after any compressor operation). Normal heating operation resumes.	The water heater is operating in Hybrid mode. Quickly provides initial amount of hot water with heating elements, then switches to efficient heat pump for majority of heating.

Note: The heat pump operating range is 35°F to 120°F (2°C to 49°C). If the ambient temperature is outside of this range, the heat pump will turn off and the electric elements will be used until the ambient temperature returns to within the operating range. During commissioning, a self-test countdown number will be displayed indicating the time remaining before the unit begins normal operation.

BRADFORD WHITE®
WATER HEATERS

Installation Instructions Document found On Every Water Heater

Frequently Asked Questions

Filter:

Q: Why is there a filter?
A: In Hybrid and Heat Pump (Only) the unit moves air through the system. The filter protects the unit from dirt and debris. A clean air filter improves efficiency.

Q: How do I clean the filter?
A: Leave the power ON and remove filter from top of unit. The filter can be vacuumed clean or rinsed with warm water. Once cleaned, reset the alarm by pressing and holding the FILTER button. A dirty filter will reduce water heater efficiency.

Modes:

Q: What is “Heat Pump (Only)”?
A: Heat Pump (Only) is the **most** efficient mode. It takes heat from the air to heat water, cooling the surrounding air. It has slower recovery but is the **most** efficient mode.

Q: What is “Hybrid”?
A: Hybrid Mode combines benefits of Heat Pump (Only) with the speed and power of Standard Electric. This provides great performance with less energy.

Q: What is “Vacation” Mode?
A: If you are gone for an extended period, this mode lowers the water temperature to reduce energy used. Unit will switch to the previous mode one day before you get back.

Q: What is “Electric (Only)”?
A: Electric (Only) mode uses only the resistance heaters to heat the water. This gives faster hot water recovery than Hybrid mode but uses more energy. This mode operates without the fan, stopping the cool air normally discharged during heat

Installation Instructions Document found On Every Water Heater

Q: Why does the Electric (Only) green LED flash?
A: In this mode, the green LED light will flash after 48 hours as an indication that the unit is NOT operating in the most energy efficient mode.

Operation:

Q: Why can I hear the unit run?
A: In the most energy-efficient models, Heat Pump (Only) and Hybrid, the method used to heat the water used a fan that can be heard while running.

Q: The heat pump is not running its normal length of time. What causes this?
A: Under some conditions, the water heater will operate using the electric elements instead of the heat pump to protect your unit and ensure hot water is available to you. These conditions include extreme cold ambient temperature (<35°F), extreme hot ambient temperatures (>120°F), or very low voltage conditions. The unit will return to normal operation when conditions permit.

Q: Why does the water heater display a number other than the temperature setpoint at startup or following a power loss?
A: During commissioning, a self-test countdown number will be displayed indicating the time remaining before the unit begins normal operation. It is heating water during this time.

Q: Why isn't the temperature setting always displayed on the temperature setpoint at startup or following a power loss?
A: The control will only display the temperature setting when a heat source is called for by the system and will turn off when the heating elements and heat pump are not running. Pressing any button will wake the control and display the temperature setpoint. The display screen will go blank after a period of inactivity in order to conserve energy.

Q: Why is one of the operating mode LEDs flashing?
A: In Hybrid Mode, the Electric (Only) Mode LED will flash anytime the heating elements are active, such as during the initial recovery from a large draw. In Electric (Only) Mode, the operating mode LED will flash after 48 hours as an indication that the unit is not operating in the most energy efficient mode. These are both normal conditions and do **NOT** indicate an operating issue.

Installation Instructions Document found On Every Water Heater

Fault Codes

Note: It's important to note that fault codes should only be used to help identify components which require testing. *Never replace a part based solely on a fault code.* The control can generate a false fault if the right conditions exist. Contact a certified technician to assess and repair the water heater based on the fault codes

Fault Code Displayed	Fault Counts Before Code Displayed	Condition
FC	10	Control checks to ensure evaporator is free of frost. Continuously verifies that T3a sensor (evaporator inlet temperature) is greater than 20°F after 30 minutes of run time.
Fd	10	Control checks to ensure evaporator superheat* is OK (controlled by EEV). Continuously verifies the temperature difference between T3a sensor (evaporator inlet temperature) and T3b sensor (evaporator outlet temperature) is greater than 5°F after 30 minutes of run time. Control also verifies that T3a is greater than 10°F less than T5 ambient sensor.
FE	10	Control checks to ensure the compressor discharge temperature never exceeds 240°F. Continuously verifies that T4 sensor (compressor outlet temperature) is less than 240°F every minute of run time.
FF	10	Control checks to ensure the EEV is operating properly and valve rotation is within range.
FG	10	Control checks to ensure ambient temperature is within an acceptable range before starting heat pump. Heat pump operating range is 35°F < [T5 ambient] < 120°F. If ambient temperature (as viewed by T5 sensor) is outside of this range, the water heater will switch to Electric/Standard Mode for that heating cycle only. NO fault code is shown on the display.
FI*	10	Control checks to ensure evaporator superheat is <20°F AND the EEV position is <450 after 30 minutes of run time. If outside these limits, this provides an early indication of a refrigerant leak. (Note: Target superheat is generally 10°F, and EEV generally operates at a position much lower than 450).

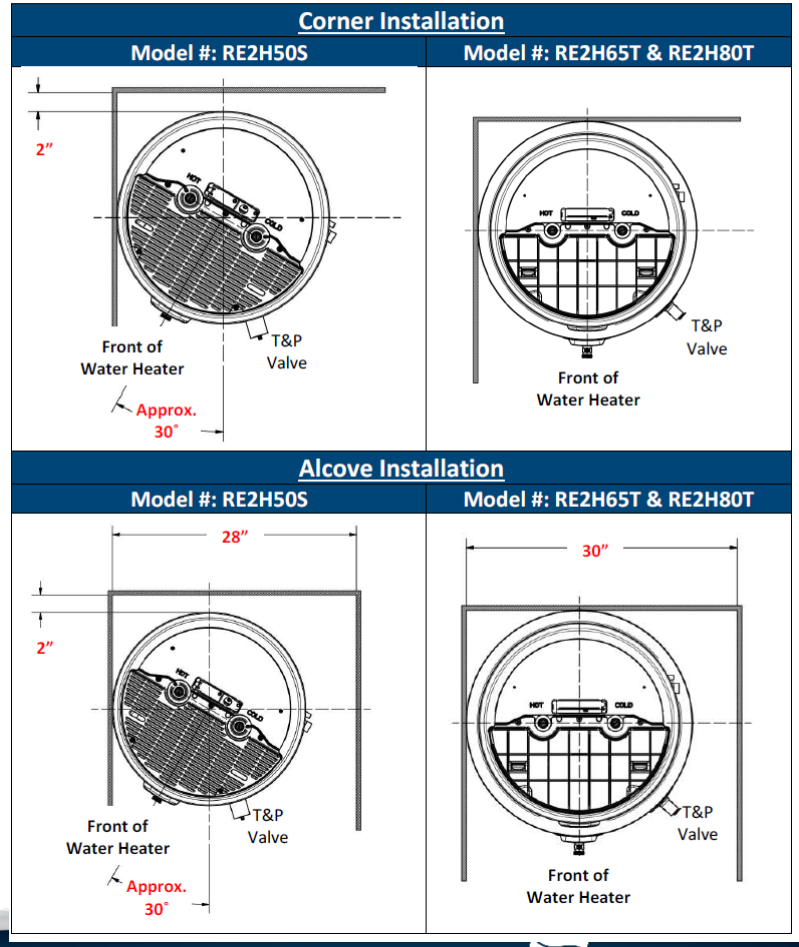
BRADFORD WHITE®
WATER HEATERS

Clearance = Serviceability

- **Only** heat pump water heater fully repairable in home, including sealed system – Others repair electrical only
- 100% serviceable in place with 7” spacing – New Construction
- 50-gallon, zero clearance left side – 2” back – Replacement existing home minimum space
- 65/80-gallon zero clearance left side/back – Replacement existing home

MINIMUM REQUIRED CLEARANCES:

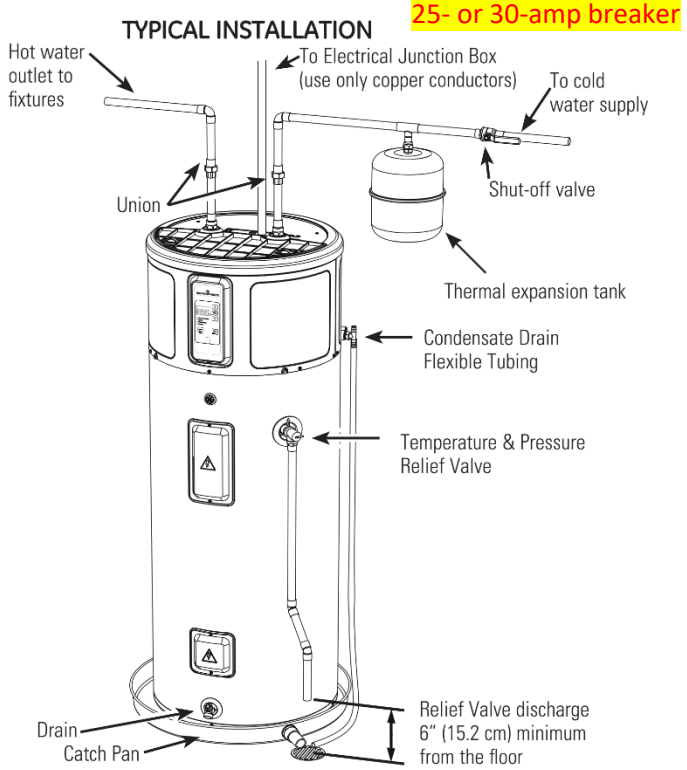
NOTE: Installations in a confined space, or installations where the recommended service clearances are not met, will lead to higher power consumption (increased use of resistance heating elements and/or heat pump efficiency reduction).



BRADFORD WHITE® WATER HEATERS

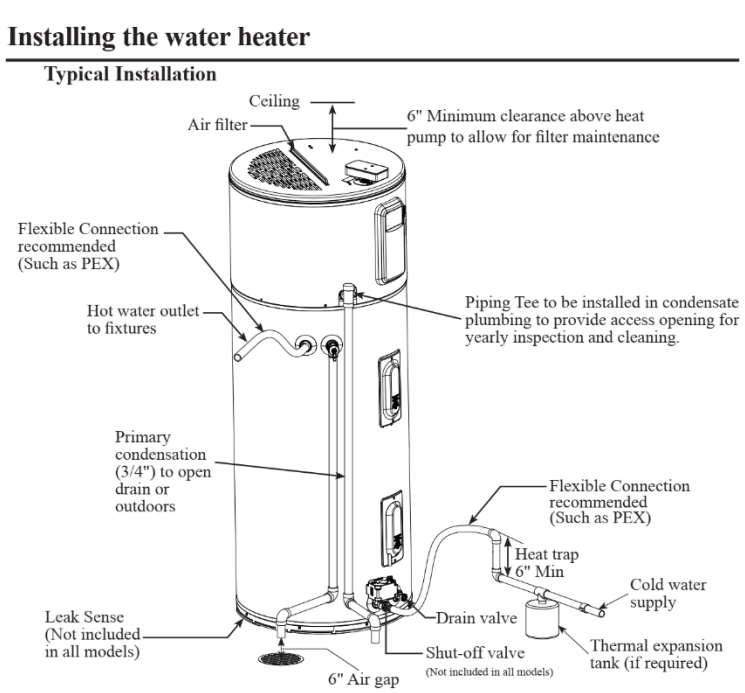
Typical Installation View by Manufacturer

25- or 30-amp breaker



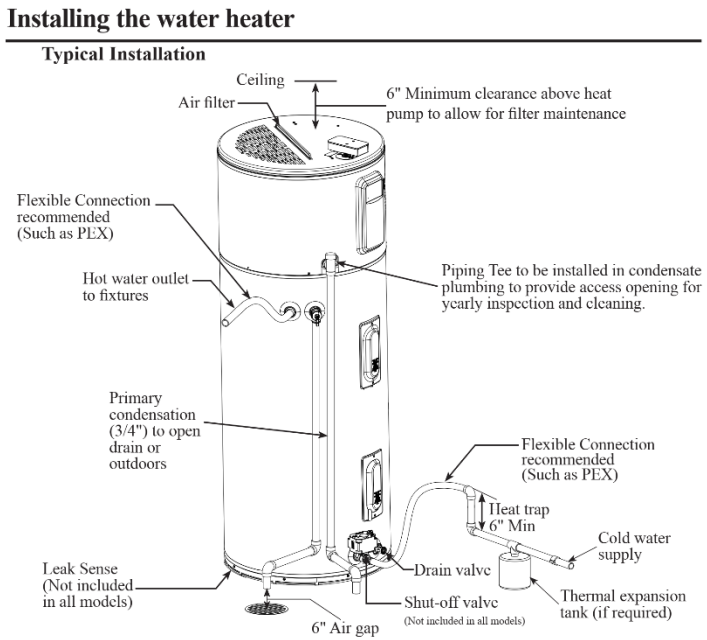
BRADFORD WHITE WATER HEATERS

30-amp breaker

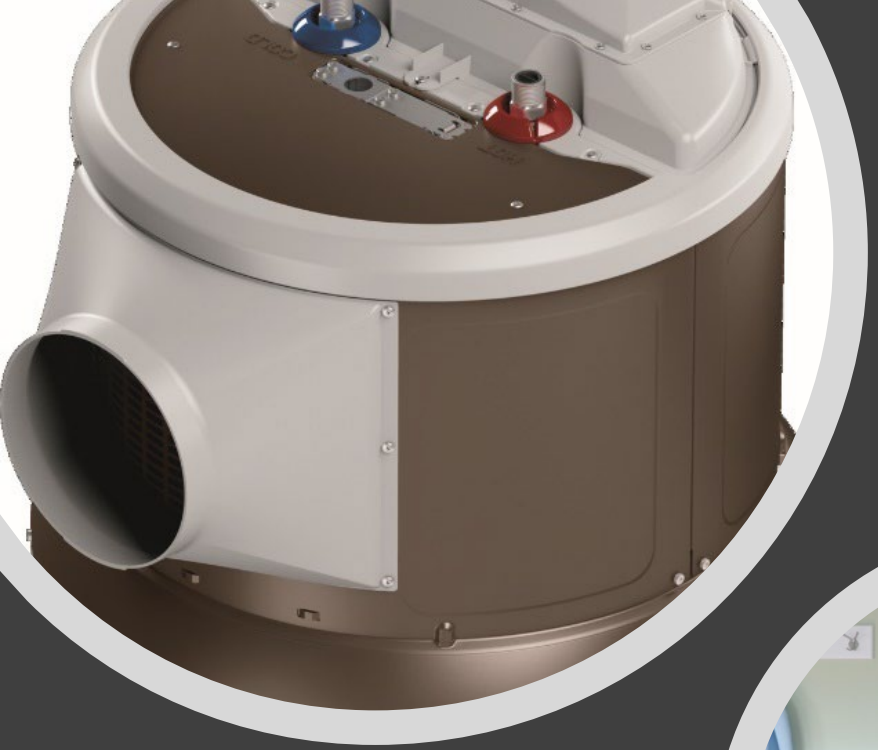


Rheem

30-amp breaker



A.O. Smith



Venting a HPWH – Rarely used

- **For air flow management in living spaces**
-
- Cooling affect without venting is about only about 3-5 degrees when running, depending on manufacturer
- Provides flexibility of installation in living areas and confined spaces for maximum comfort
- Meets Northern Climate Specification Tier 4 requirements

HPWH Service Procedure – know the manufacturer

- Two parts of heater to be serviced
  - Electrical/plumbing – majority of fault codes fall here –(*Any plumber can do this*)
    - Elements
    - Sensors
    - Fan/motor
    - Control board
  - Sealed system – *requires HVAC license* – (Only Bradford White - Others replace)
    - Compressor
    - Evaporator
- Who to call – 888-443-4394 – Heat pump line
  - 8-7 Eastern time M-F – Primary resource
  - Tech support/Parts – 800-334-3393 24/7 – *Exclusive Bradford White*
- When to call
  - BEFORE going to the home!
  - Consult with Tech Support
  - Parts can be overnighted directly to contractor AFTER talking to Tech Support
  - Should heater need to be replaced, Tech Support will issue Return Authorization before heater is removed and returned to distributor!

BRADFORD WHITE®
WATER HEATERS

GET HEAT PUMPED UP!™

AeroTherm Series®
Heat Pump Water Heater

Gregg Holladay

Business Development Manager

gholladay@BradfordWhite.com

bradfordwhite.com

502-774-0773

*Bradford White is an American company with its manufacturing facilities located in the United States of America. Products made by Bradford White are manufactured in the United States using the finest raw materials and components from around the world to deliver the highest quality and value to our customers.

BRADFORD WHITE WATER HEATERS

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