



The new degree of comfort.®

The Water Heater of the Future - Hybrid Heat Pump Technology



HEATING  COOLING  WATER HEATING

20181127 Rev4





Outline

- Why Choose Heat Pump Water Heaters?
- How do they work?
- Installation and Retrofit applications
- Future of Water Heating
 - EcoNet and Demand Response
- New Construction
- Commercial and Multi-family



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Why Heat Pump Water Heaters?

HEATING



COOLING



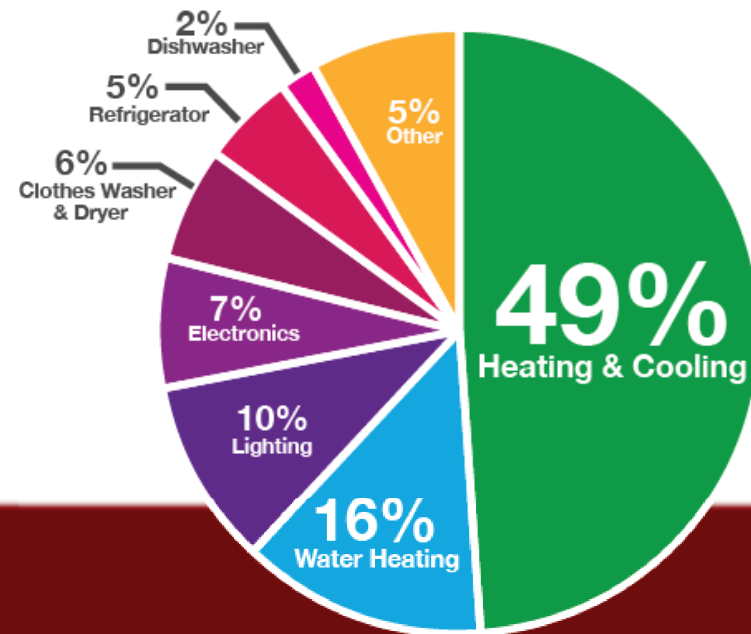
WATER HEATING



Home Energy Use

Rheem can help a homeowner control 65% of their home's energy usage.

Water Heating is The **2nd Highest** Energy User In The House



Hybrid Electric Water Heater





Why Care About Heat Pump Water Heating?

Water Heating is The
2nd Highest
Energy User In The Home

HPWH are *THE MOST* efficient
way to heat water...only
technology over 100% efficient

Save over **\$300** per Year with
a
Hybrid Electric Water Heater



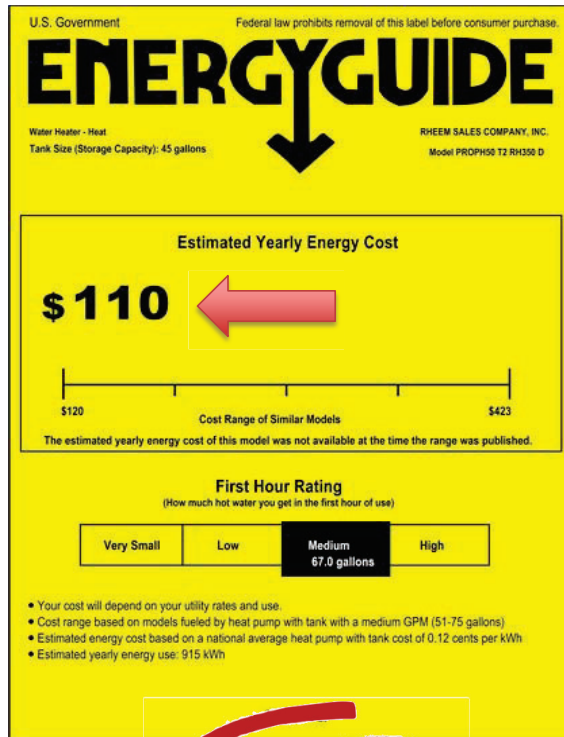


70%+ Annual Operating Cost Savings with Heat Pump Water Heating

50 gallon Heat Pump
water heater

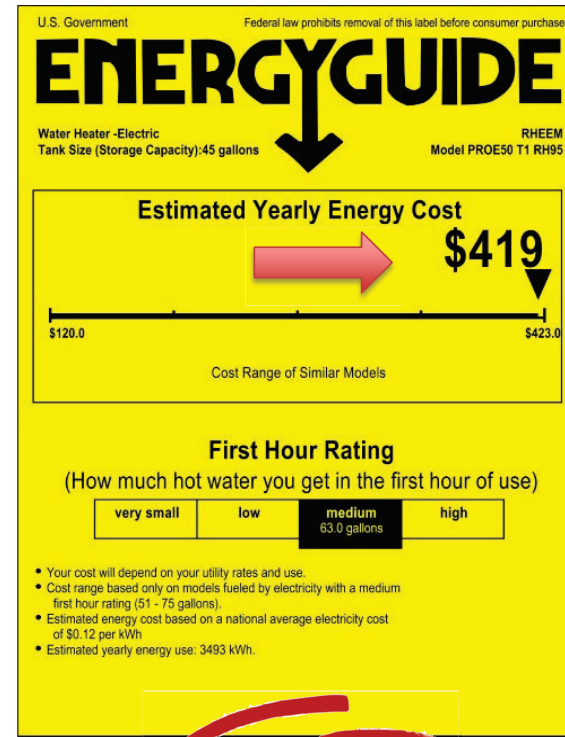


915 kWh annual
energy use



3.55 UEF

50 gallon with electric
resistance elements



.93 UEF



3493 kWh annual
energy use

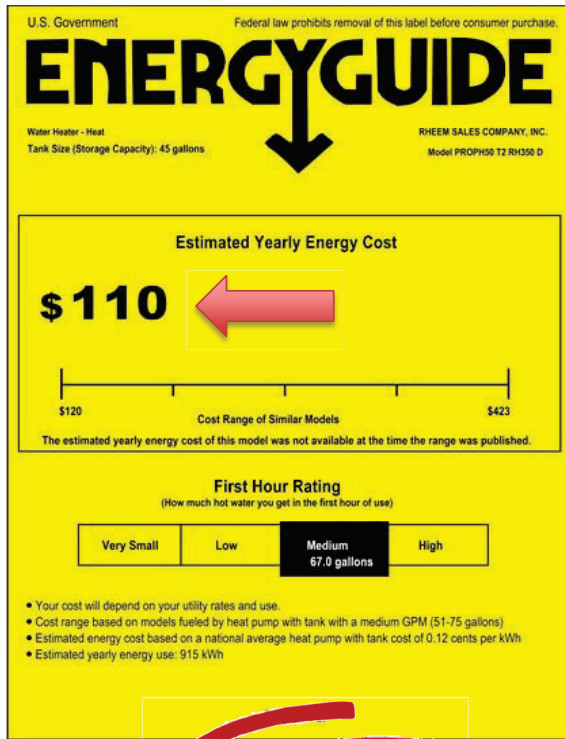


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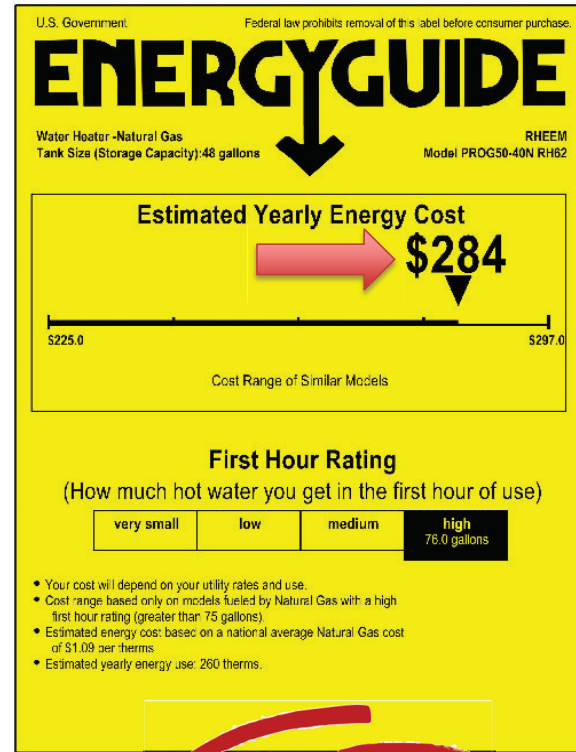


915 kWh annual
energy use



3.55 UEF

water heater



.64 UEF



264 therms
annual energy use

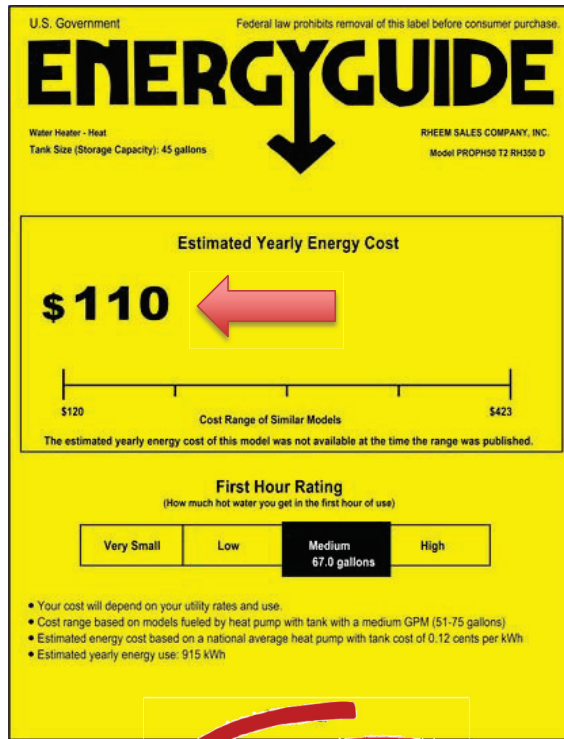


70%+ Annual Operating Cost Savings with Heat Pump Water Heating

50 gallon Heat Pump water heater

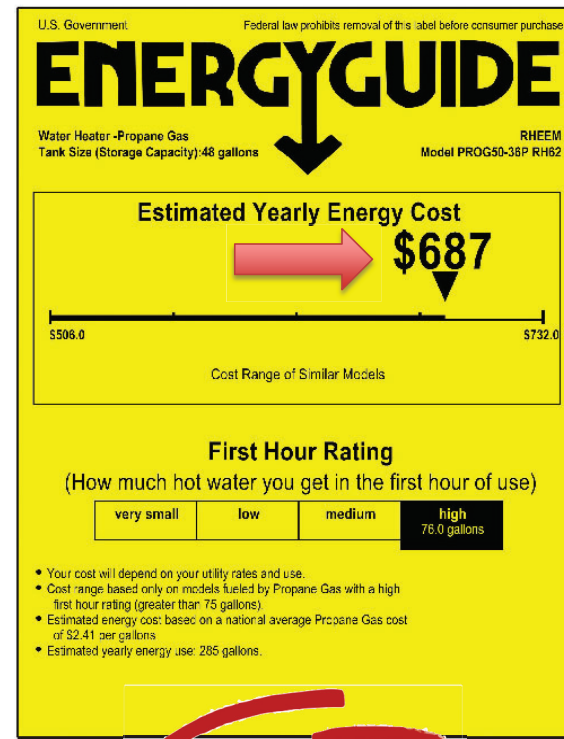


915 kWh annual energy use



3.55 UEF

heater



.65 UEF



285 gallons annual energy use



Hybrid Heat Pump Water Heater


Features			
Capacity (gal)	50	65	80
UEF	3.5	3.7	3.7
Annual Operating Cost	\$110	\$161	\$161
FHD	67	75	89
Up to \$4000 Lifetime Savings			
49 DBA Sound Level			
Water Sensor – Yes			
EcoNet Enabled - Yes			
Tier 3 Northern Climate Spec			
Condensate Management - Yes			
Horizontal & Vertical Shipping			
Duct Ready – Inlet & Exhaust			
No Space Requirement			



✓ Integrated Wi-Fi Controller
✓ Free EcoNet App
✓ Remote Alarms and Alerts
✓ Energy Use Report via App



Return On Investment

Total Savings For Hybrid Water Heater										
Investment (After Rebate)	Annual Operating Cost	Hybrid Water Heater - Return on Investment								
<p>Electric \$ 559.00 Hybrid \$ 850</p> <p>Electric \$ 594 Hybrid \$ 156</p>		<p>Lifetime Return on Investment</p> <p>\$ 4,184</p> <p>Annual Energy Cost Savings</p> <p>\$ 438</p> <p>Pays For Itself In:</p> <p>7.97 months</p> 								
		<table border="1"> <tr> <td>kw/h Cost:</td> <td>\$ 0.17</td> </tr> <tr> <td>Local/Gov't Rebate:</td> <td>\$ 500.00</td> </tr> <tr> <td>Hybrid Initial Cost:</td> <td>\$ 1,350.00</td> </tr> <tr> <td>Electric Initial Cost:</td> <td>\$ 559.00</td> </tr> </table>	kw/h Cost:	\$ 0.17	Local/Gov't Rebate:	\$ 500.00	Hybrid Initial Cost:	\$ 1,350.00	Electric Initial Cost:	\$ 559.00
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Hybrid Initial Cost:	\$ 1,350.00									
Electric Initial Cost:	\$ 559.00									



Payback Story



Hybrid HPWH.....\$2500

Standard Electric WH\$1500

Cost Difference: \$1000

Rebate (up to \$600 + tax credit) -\$ 500

Total Upgrade Cost \$ 500

\$438 Energy Savings per year

Pays for itself in **Just over 1 Year!**

\$3,880 Lifetime Savings!



Environmental Considerations



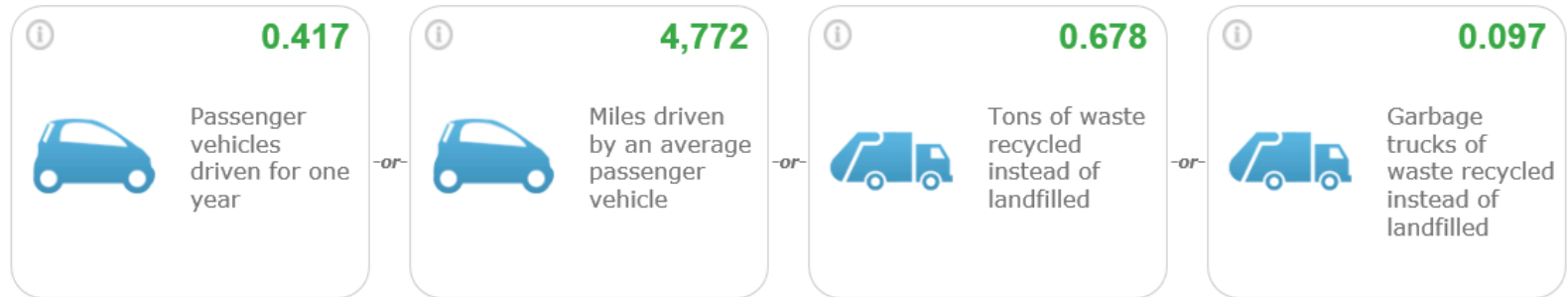
Equivalency Results

[How are they calculated?](#)

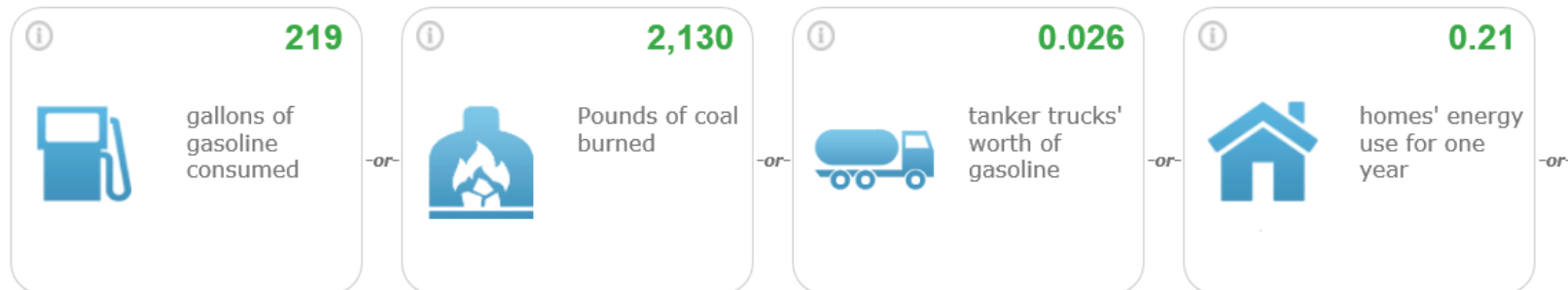
The sum of the greenhouse gas emissions you entered above is of Carbon Dioxide Equivalent. This is equivalent to:

1.9 **Metric Tons**

Greenhouse gas emissions from

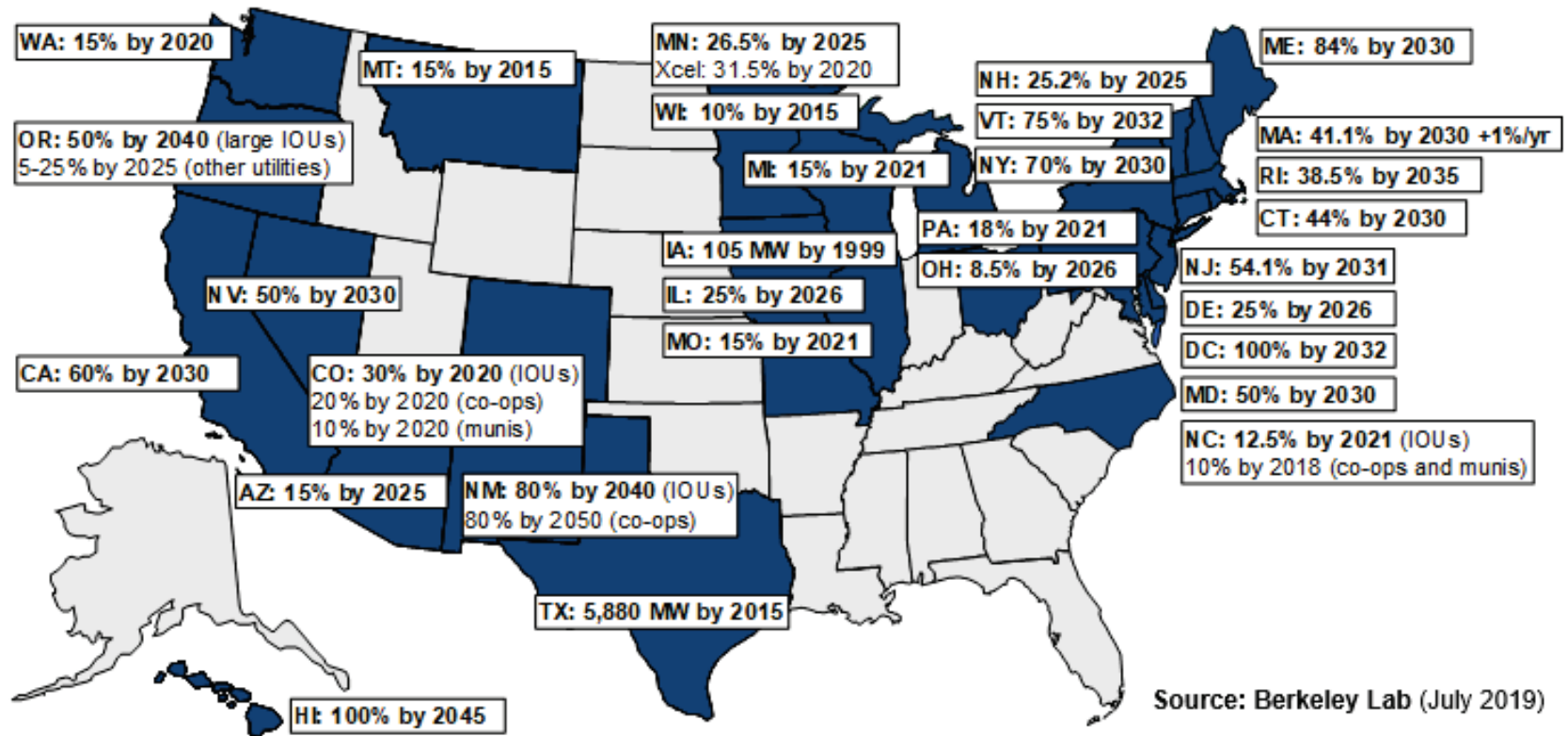


CO₂ emissions from





National Profile



Source: Berkeley Lab (July 2019)



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How it works

HEATING



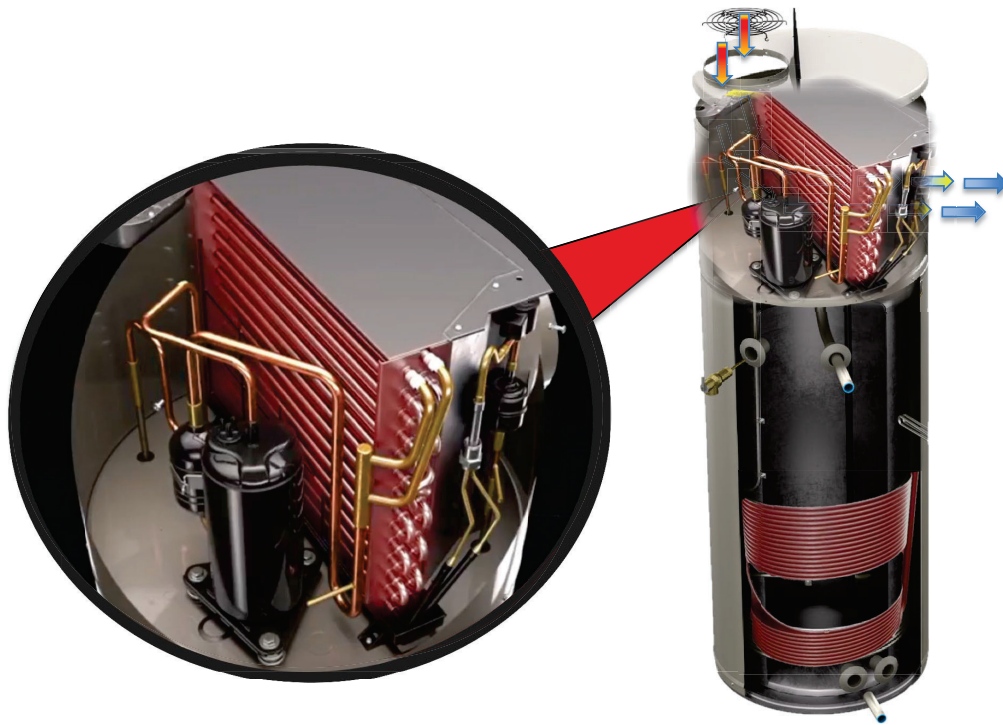
COOLING



WATER HEATING



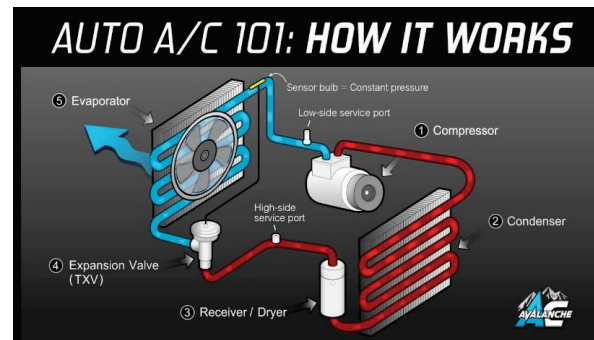
How It Works (Heat Pump)



- Ambient air is pulled into unit and heat is absorbed by the evaporator coil
- Compressor increases the temperature of the refrigerant
- Heated refrigerant is pumped into the condenser coil
- Condenser coil tubing is wrapped around the tank and transfers heat from the refrigerant to the water



Sound Familiar?







Recovery and Sound dB



Efficient

- Compressor uses 300-500W but delivers 1700W of hot water recovery

Smart

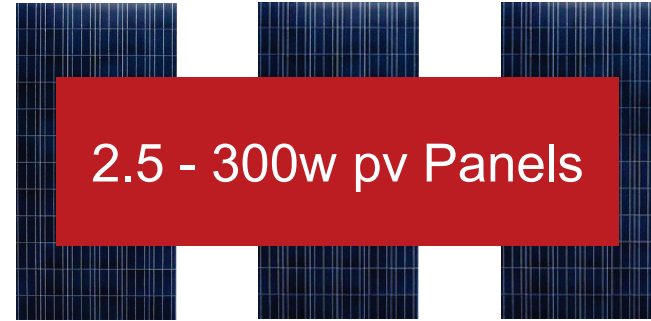
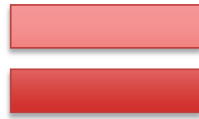
- 5000W heating elements
- As much hot water **or more** as standard electric tank
- LeakSense
 - Leak Detection
 - Protects your home
 - Audible Alert from unit
 - Alerts via EcoNet® App

Quiet

- Can be installed in the living space. As quiet as a dishwasher or refrigerator (49dB)



Value Proposition With Solar



Standard
Electric Water
Heater

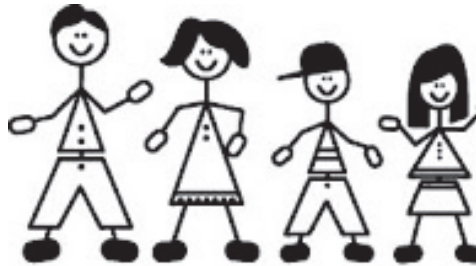




30 Amp Models

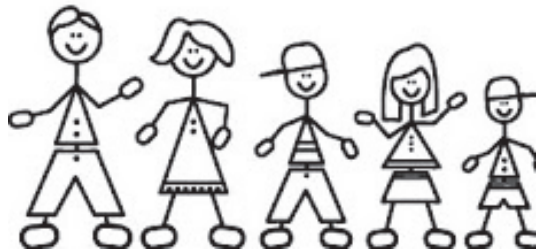
50 Gallon

Delivers 4 hot 8-minute showers back-to-back



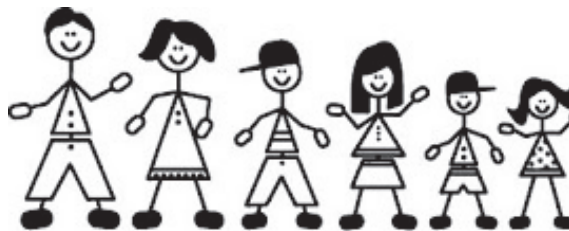
65 Gallon

Delivers 5 hot 8-minute showers back-to-back



80 Gallon

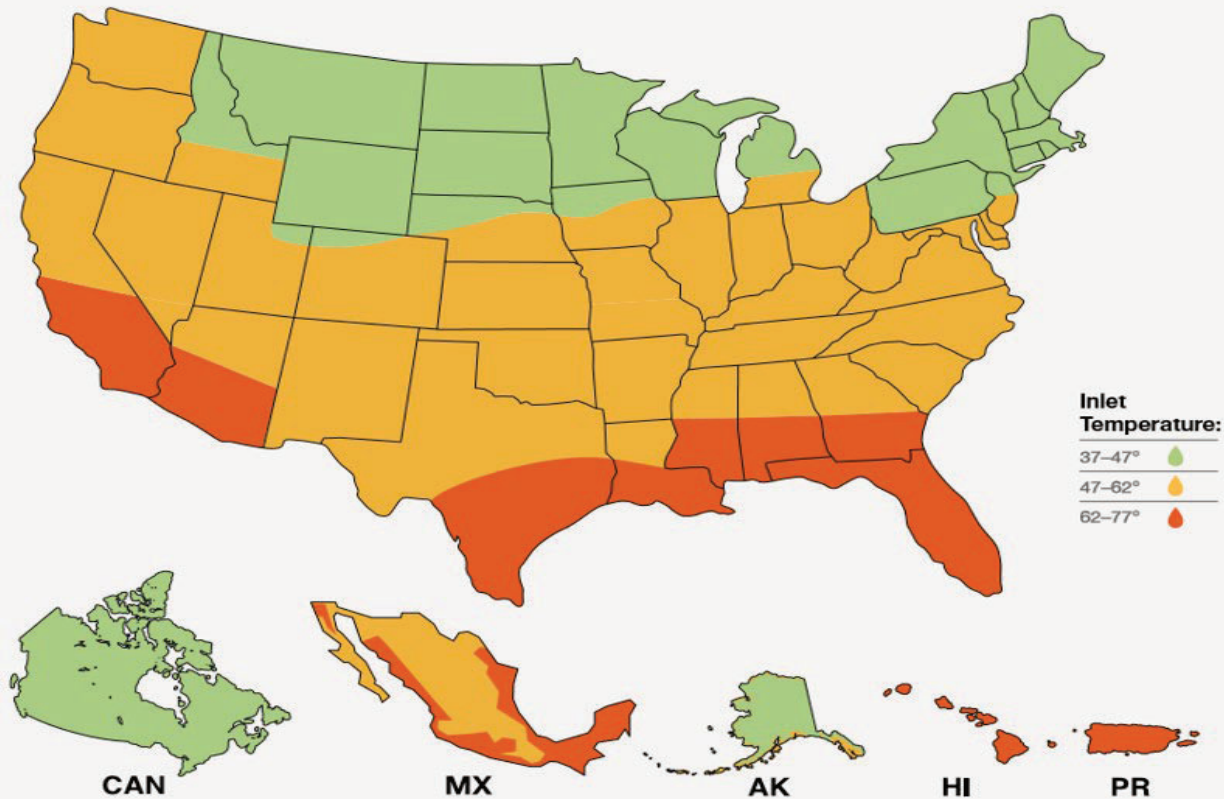
Delivers 6 hot 8-minute showers back-to-back





Hybrid Sizing Chart

1 Identify customer location on the map and respective inlet temperature





Hybrid Sizing Chart

2 Assess your customer's hot water usage based on the number of back-to-back showers

3 Determine the best model for your customer based on their usage and inlet temperature from step 1

MODEL, INLET TEMPERATURE AND APPROXIMATE USAGE CHART

15 AMP Models

Models rated at:		Inlet Temperature 37-47°	Inlet Temperature 47-62°	Inlet Temperature 62-77°
Model #	Approximate Usage	Approximate Usage	Approximate Usage	
50 Gallon PROPH50 T2 RH350 D15	3 showers	4 showers	5 showers	
65 Gallon PROPH65 T2 RH350 D15 6	4 showers	5 showers	6 showers	
80 Gallon PROPH80 T2 RH350 D15	5 showers	6 showers	7 showers	

USAGE KEY



Shower
Flow rate
of 2.5 GPM

Inlet Temperature:
The temperature of cold water before it enters your water heater.

Approximate Usage:
120°F and shower temperature of 105°F. Flow rates vary depending on temperature of incoming cold water and water heater set temperature.

30 AMP Models

Models rated at:		Inlet Temperature 37-47°	Inlet Temperature 47-62°	Inlet Temperature 62-77°
Model #	Approximate Usage	Approximate Usage	Approximate Usage	
50 Gallon PROPH50 T2 RH350 DCB	3 showers	4 showers	5 showers	
65 Gallon PROPH65 T2 RH350 DCB 6	4 showers	5 showers	6 showers	
80 Gallon PROPH80 T2 RH350 DCB 6	5 showers	6 showers	7 showers	

NOTE: Number of showers indicates how many eight-minute showers can be delivered back-to-back.



Specifications

Capacity	50 Gallon		65 Gallon		80 Gallon	
BREAKER SIZE	30A	15A	30A	15A	30A	15A
MODEL NUMBER	PROPH50 T2 RH350 DCB	PROPH50 T2 RH350 D	PROPH65 T2 RH350 DCB	PROPH65 T2 RH350 D15	PROPH80 T2 RH350 DCB	PROPH80 T2 RH350 D15
UEF	3.55	3.55	3.70	3.55	3.70	3.55
HEIGHT	61"		64"		74"	
DIAMETER	22 1/4"		24 1/4"		24 1/4"	
COMPRESSOR BTU	4200		4200		4200	
WEIGHT	178 lbs		225 lbs		244 lbs	
SOUND LEVEL	49 dBA		49 dBA		49 dBA	
VOLTAGE	240V		240V		240V	
UPPER ELEMENT	5000W	2250W	5000W	2250W	5000W	2250W
LOWER ELEMENT	5000W	2250W	5000W	2250W	5000W	2250W



15 amp Gen 4 HPWH

Product



Only requires 15 amp breaker vs. 30 amp breaker used for all Electric WH

Changes



1. Replaced upper & lower element with 2250 W
2. Industry leading best in class efficiency UEF of 3.55

Reason's To Buy



1. Customer with limited breaker capacity
2. Multi-Family application
3. Utility incentive for Gas to Hybrid conversion with minimum electrical cost
4. Warm climate friendly like California, Florida, Arizona etc...





Modes Of Operation



HEAT PUMP

- Water is heated using the heat pump and will not utilize electric heating elements

ENERGY SAVER (default mode)

- Optimizes heat pump and electric heat



HIGH DEMAND

- Utilizes heat pump and electric heat simultaneously



ELECTRIC

- Uses only the electric heating elements



VACATION

- Tank temperature will be maintained at 65° for 1-28 days or held indefinitely when “HOLD” feature is used



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Installation

HEATING



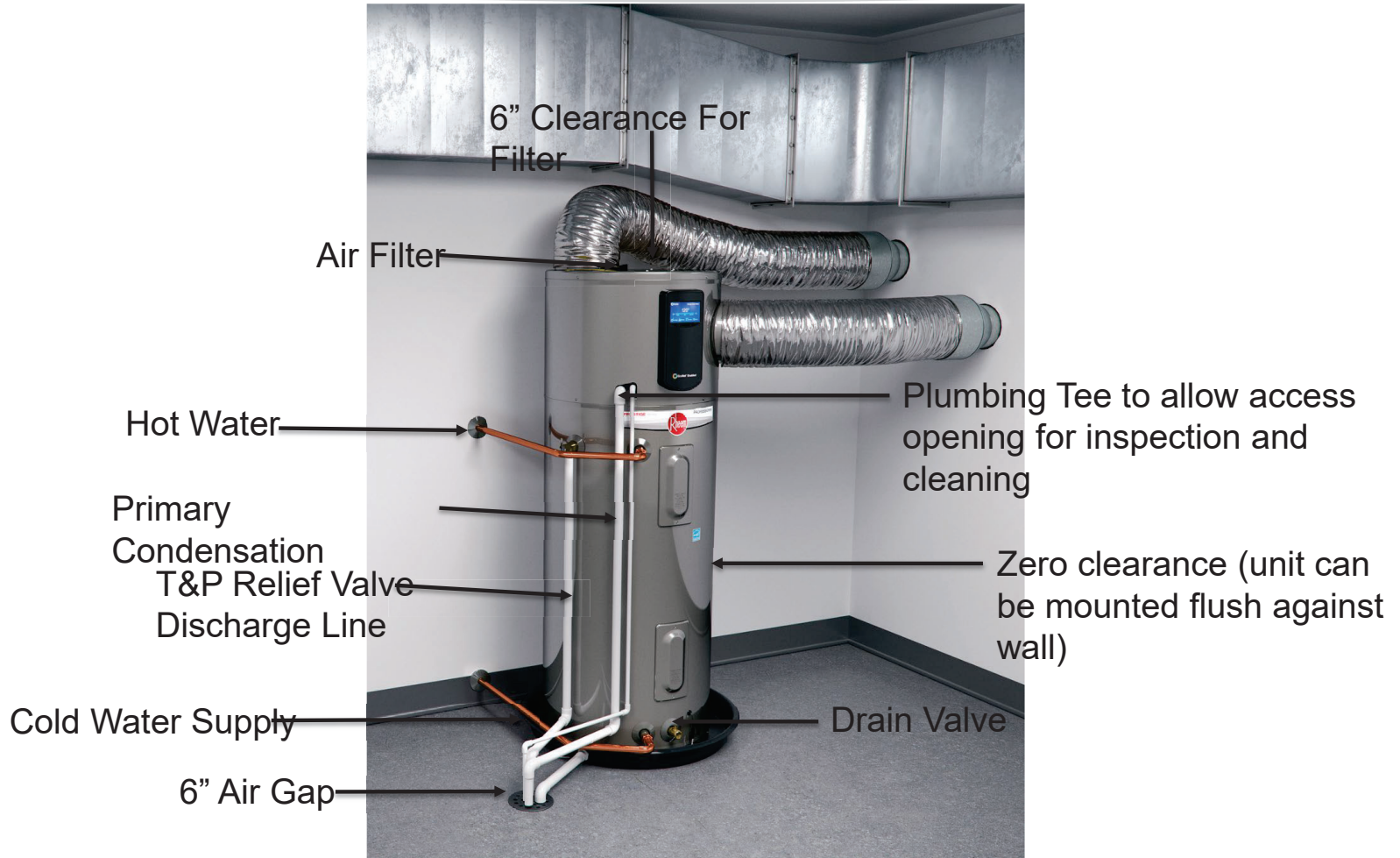
COOLING



WATER HEATING



Example of Installation





Installation with No Ducting

Option 1:

Heater: Not Ducted

Room size: Smaller than 700 ft³ (e.g. 7' x 10' x 10').
Requirements: Full louvered door OR two louvers top and bottom.

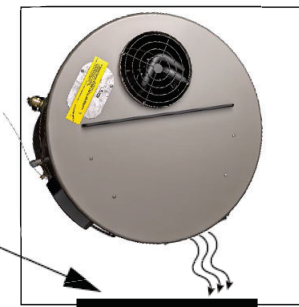


Option 2:

Heater: Not ducted

Room: Small Closet

Requirements: * Air gap under door equal to 18 in² (0.75" clearance).
* Louver must be located the same height on door as the air exhaust on heater.
* Heater air exhaust must be positioned towards louver within one foot of door.





Installation with Ducting

Heater: Ducted with inlet OR outlet duct

Room size: Any size room

Requirements: Air gap under door equal to 18 in²
(0.75" clearance)



Heater: Ducted with inlet AND outlet duct

Room size: Any size room

Requirements: No additional ventilation needed.





What's The Same



208/240V 30Amp



Can Be Transported
On Its Side



Can Be Placed
Against a Wall



100% Plumber
Serviceable



What's Different

- Condensation Drain
- About 50lbs Heavier
- 10-Year Warranty
- Needs 700 Cubic Ft Space to Exchange Heat
- Will Make Noise (49db-quietest in the industry!)
- Side-Mount Water Connections (Same $\frac{3}{4}$ " Size)





How would you respond?

Heat pump water heaters won't work in a cold climate....

Will work in temperatures as low as 38°F and offer year round savings regardless of climate

Condensate water should be neutralized.....

Condensate water from this unit is not acidic (*no flue gases*) and does not need to be neutralized

It's too expensive.....

60% energy savings and local utility incentives

It's too loud.....

only 49 decibels- Quietest hybrid unit currently available

I don't want to run out of hot water.....

Same delivery (*or more*) as a standard electric tank



The new degree of comfort.®

What does the future look like?

HEATING



COOLING



WATER HEATING



EcoNet®



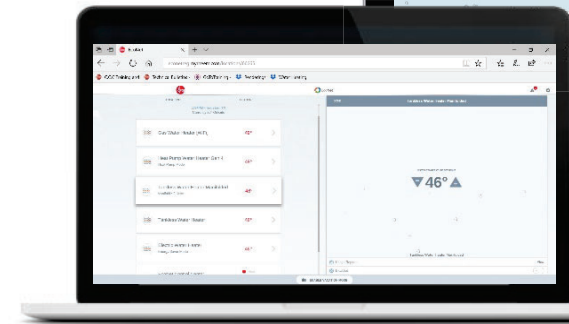
EcoNet®



Intelligence

- Leak Detection
- Diagnostics
- Sensors

Connectivity





There's an APP for That

Built-In Integrated Wi-Fi **NEW**

Wi-Fi to receive alerts and alarms with no additional cost

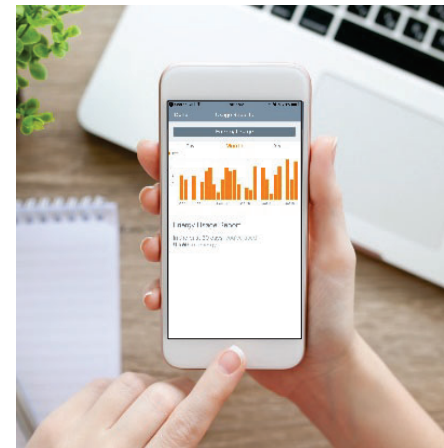
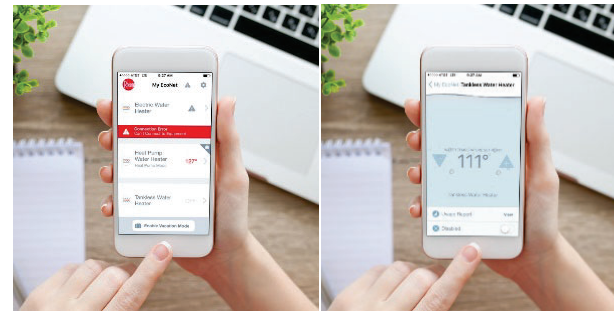


On screen Wi-Fi Set up **NEW**

Simplifies Wi-Fi set up for the plumber or homeowner

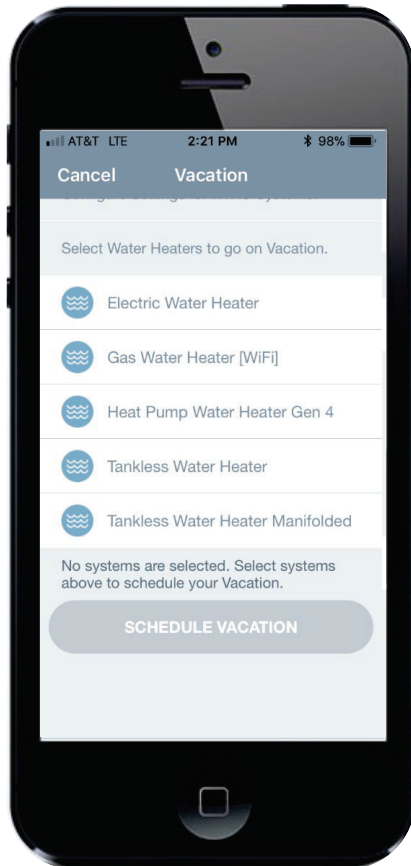
Energy Usage Reports **NEW**

Provides real time information on energy use





EcoNet®



Command and Control

- Adjust water heater temperature
- Change Mode of Operation
- Set to Vacation Mode

User and Usage Data

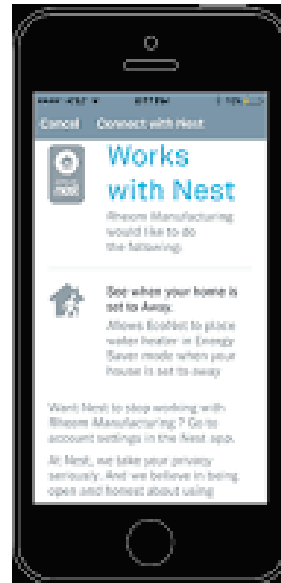
- View Usage Reports
- Total kWh used in the last day, month, year

Error Alerts

- View error codes
- Send error codes directly to contractor



- Nest Thermostat
 - Automates savings by putting EcoNet connected water products in Away/Vacation mode if it detects no one in the house.
- Rush Hour Rewards
 - Nest Thermostat automatically adjusts water heating to reduce energy consumption at peak consumption time.
 - Customers are rewarded by the Utility for participating
- Nest Protect
 - Immediately extinguishes the flame in gas water heaters if it detects fumes
- Note: Nest recently purchased by Google.
 - All current customers will be supported by Nest products will leave the shelves Aug 31, 2019





- Alexa augments Rheem's Smart Thermostat with hands-free Voice Control
- EcoNet Smart Home skill certified (June 2018)
 - Supports basic commands and inquiries of HVAC systems
 - Alexa Commands-
 - “Set <Thermostat name> to <Mode>”
 - “What’s <Thermostat name> set to?”
 - “Set <Thermostat name> to N degrees”
 - “Increase <Thermostat name> by N degrees”
 - “What’s the <Thermostat name> temperature?”
- Custom skills in development
 - Certified water heater control + recirc pump
 - Advanced HVAC control (place system into away mode and set vacation)



“ Alexa ...
Set living room
temperature
to 72 degrees.”





works with the
Google Assistant

- Google Assistant augments Rheem's Smart Thermostat with hands-free Voice Control
- EcoNet Smart Home skill certified (March '19)
 - Supports basic commands and inquiries of HVAC systems
 - Google Assistant Commands-
 - "Set <Thermostat name> to <Mode>"
 - "What's <Thermostat name> set to?"
 - "Set <Thermostat name> to N degrees"
 - "Increase <Thermostat name> by N degrees"
 - "What's the <Thermostat name> temperature?"
 - Water Heater skills being reviewed now



Your Google Assistant,
always ready to help





wink

- Integrates EcoNet connected water heaters into a whole smart home control via the Wink App
 - Access features such as leak detection, service diagnostics, and system status
 - Saves money effortlessly
 - Control temperature, set schedules and put in Vacation mode when away
 - Works with the EcoNet Smart Thermostat or the Wink Hub





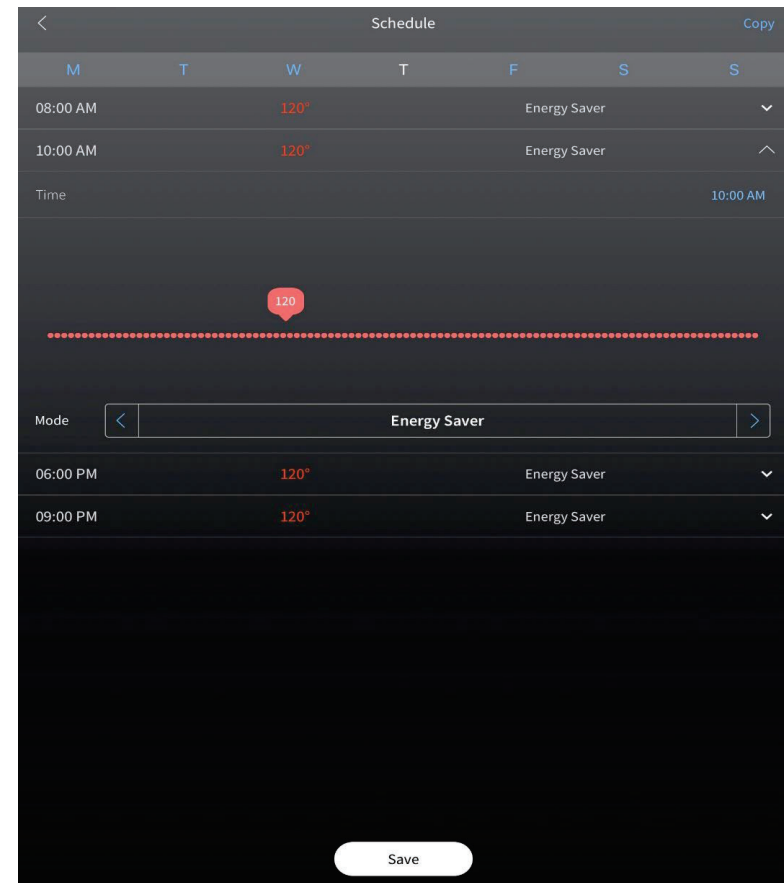
Next In Development





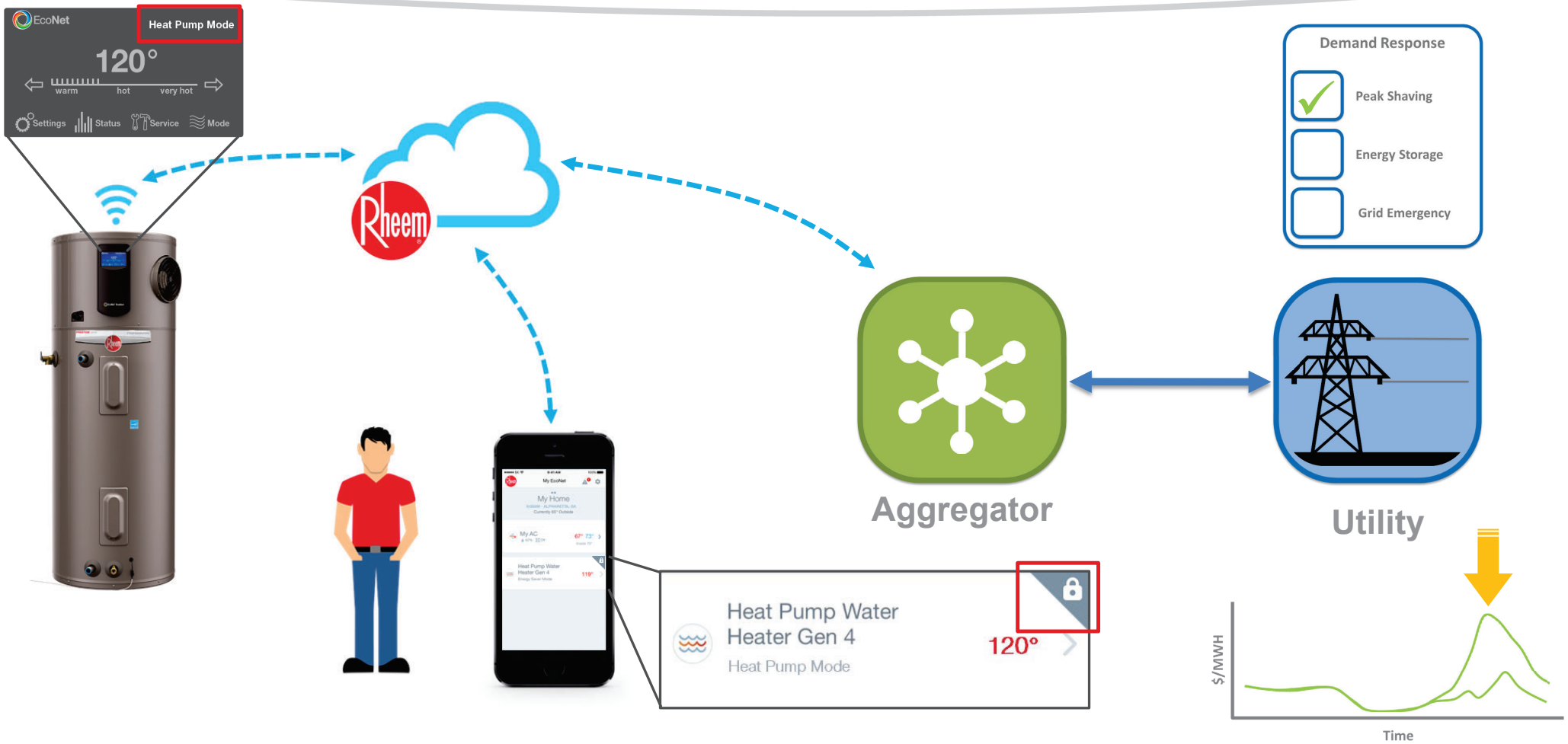
Time of Use Programming

- Home owner can program desired mode of operation at specific times throughout the day or week.
- Allows for pre-programmed temperature setting variations.
- Water heater can be set to “hybrid only” mode during peak utility hours, savings even more on utility costs.



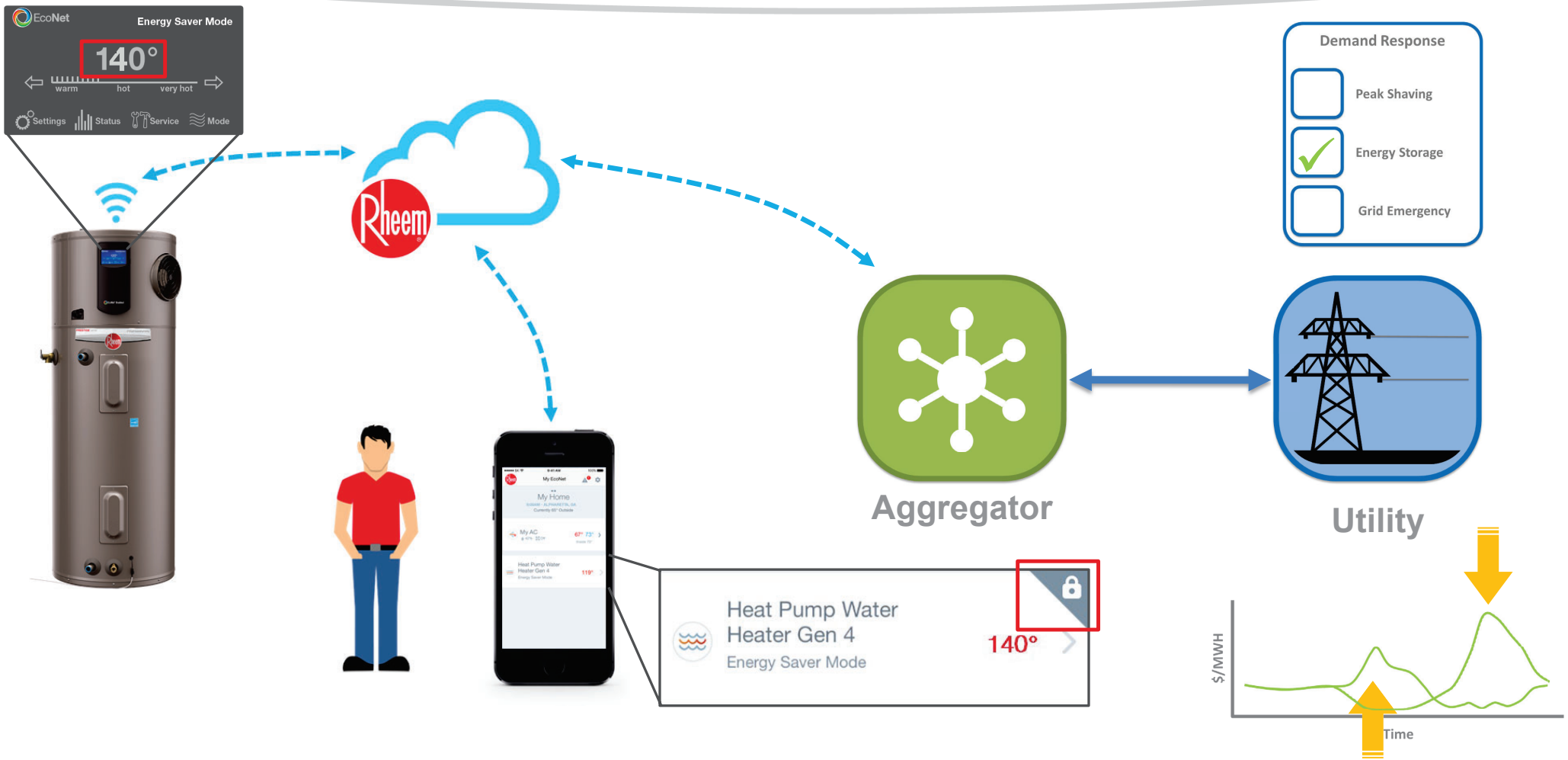


EcoNet® Demand Response Integration



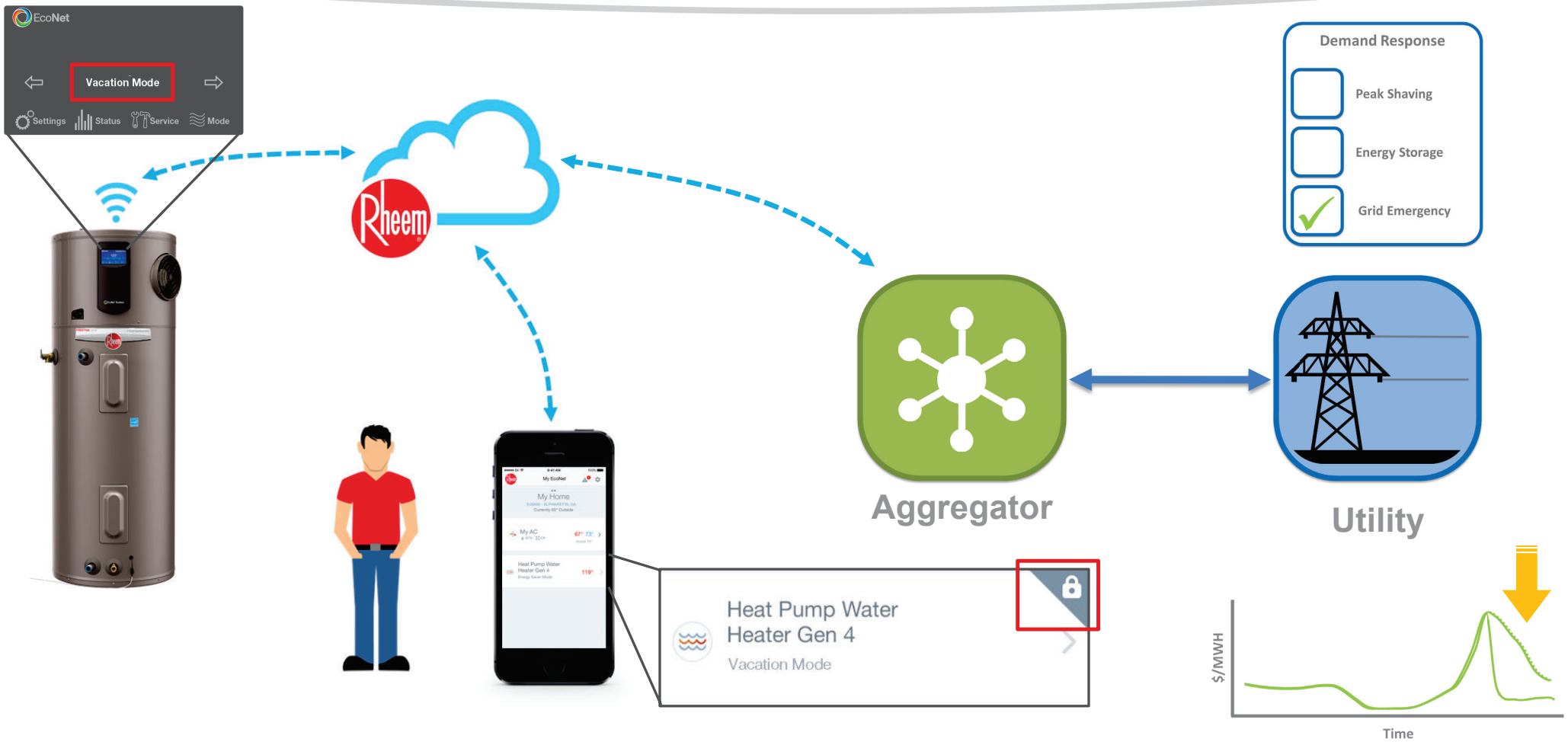


EcoNet® Demand Response Integration



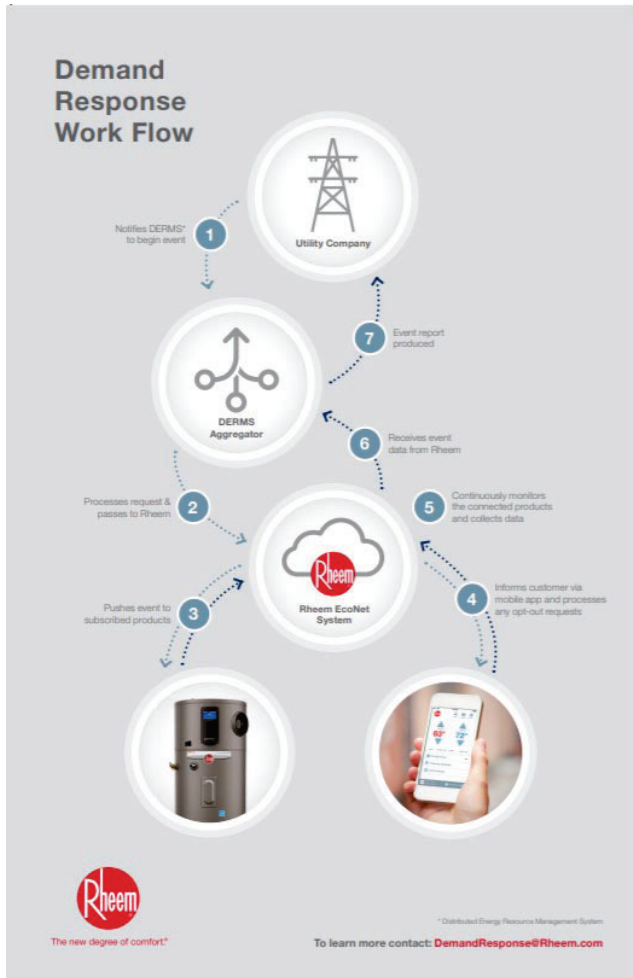


EcoNet® Demand Response Integration





Forging Partnerships for Better Grid Management





Experiment in Smart Living



SMART NEIGHBORHOOD™

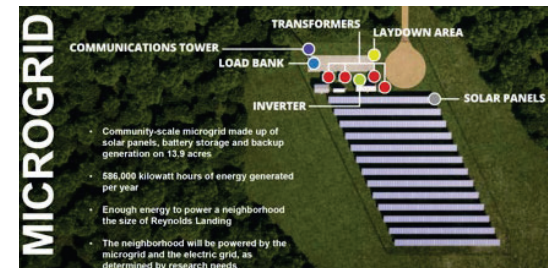
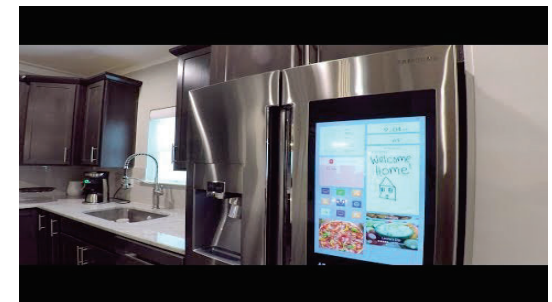


Objective

Design and build a first of a kind living laboratory to prepare APC for future grid needs and customer expectations

62 homes with Rheem Hybrid Heat Pump Water Heaters

- All EcoNet connected
- All Demand Response participants
- Sept 2018- first DR event
- Each home averaging 58% less energy use than comparable homes



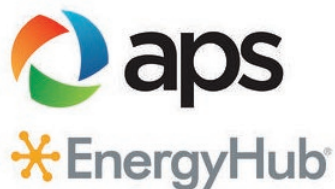


APS Reserve Rewards Program

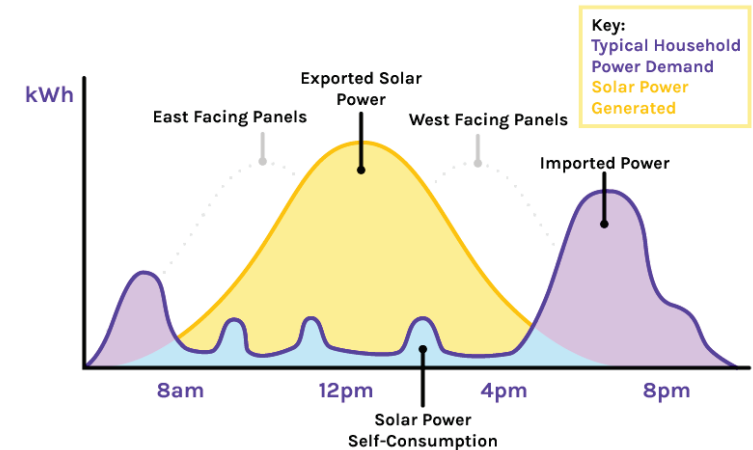


November 2018 -
200 Homes with Ruud Hybrid
Heat Pump Water Heaters

- All EcoNet connected
- All Demand Response participants
- 80 gallon hybrid installed (FREE)
- Energy Hub partnership allows APS to autonomously charge water heaters during periods of high solar generation & decrease load during system peak.



SOLAR POWER SELF-CONSUMPTION





The new degree of comfort.®

New Construction

HEATING



COOLING



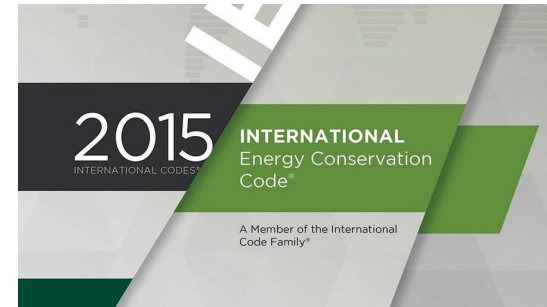
WATER HEATING



What Rating Systems Are Used



U.S. DEPARTMENT OF ENERGY
Home Energy Score



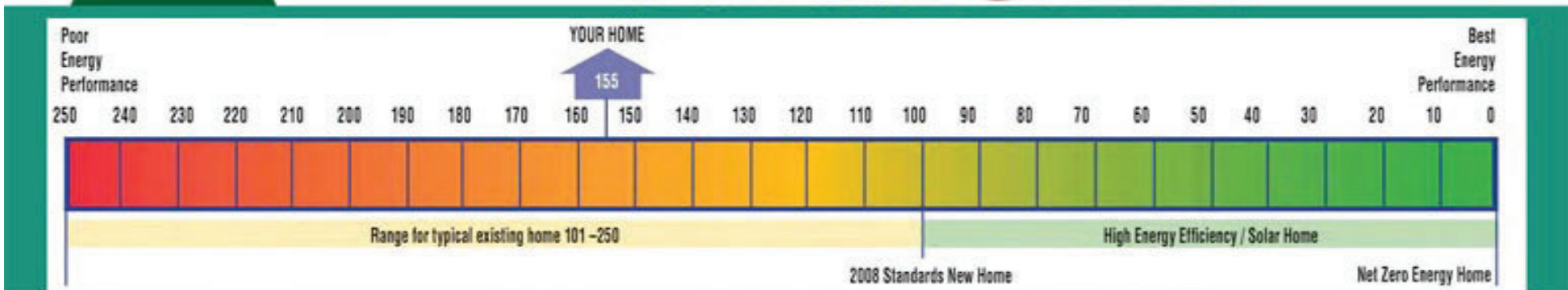


How The Home Energy Rating System (HERS) Score is Determined

HERS Index

$$\frac{\text{PEfrac} \times 100 \times (\text{Eheating} + \text{Ecooling} + \text{Ewh} + \text{Ela}) \text{ rated home}}{(\text{Eheating} + \text{Ecooling} + \text{Ewh} + \text{Ela}) \text{ reference home}}$$

Understanding your **HERS** index



[Click Here for the full chart](#)







Home Energy Rating System (HERS)

Over 2,000,000 Homes in The U.S. Were RESNET HERS Rated!
From 120,000 homes in 2011.

WHAT IS THE HERS INDEX SCORE?

The HERS Index Score is the nationally recognized, energy efficiency version of a MPG (miles-per-gallon) sticker for homes. It tells you how a home rates for energy efficiency and its potential energy savings as compared to other similar homes.

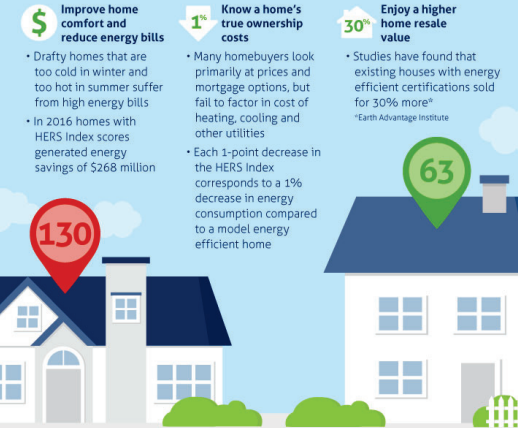





-  Lets you compare homes by energy usage
-  A lower HERS Index Score signifies a more energy efficient home with lower energy costs
-  Energy efficient homes have reduced carbon dioxide emissions by 4 million tons which is equal to taking 766,000 cars off the road each year



WHY GET A HERS INDEX SCORE?

Know if a home is energy efficient and how it compares to other similar homes



-  **Improve home comfort and reduce energy bills**
 - Drafty homes that are too cold in winter and too hot in summer suffer from high energy bills
 - In 2016 homes with HERS Index scores generated energy savings of \$268 million
-  **Know a home's true ownership costs**
 - Many homebuyers look primarily at prices and mortgage options, but fail to factor in cost of heating, cooling and other utilities
 - Each 1-point decrease in the HERS Index corresponds to a 1% decrease in energy consumption compared to a model energy efficient home
-  **Enjoy a higher home resale value**
 - Studies have found that existing houses with energy efficient certifications sold for 30% more*
*Earth Advantage Institute

HERS scores shown: 70, 130, 63

Using a Hybrid Electric Water Heater
Saves 4-7 HERS Points!



LEED for Homes

Green Building :
Leadership in Energy and Environmental Design, LEED



LEED Credit Categories



Hybrid Electric Water Heaters
give 2-3 LEED Points!



Hybrid Gen4 Product Variations

Gen4 Hybrid Replacement Model



- 3.55 - 3.70 UEF
- Integrated Wi-Fi
- Leak Sensor shipped with Unit
- Duct Ready
- Quietest Design w/49 DBA
- Brass drain valve
- Meets NEEA Tier 3
- 50/65/80 Gallon Capacity

Gen4 Hybrid Builder Model



- 3.50 – 3.70 UEF
- *Requires Wi-Fi Module*
- *No Leak Sensor*
- *Exhaust duct adapter not included*
- Quiet Design w/53 DBA
- *Plastic drain valve*
- Meets NEEA Tier 3
- 50/65/80 Gallon Capacity



Add-on Parts



Duct Adapter



EcoNet® Wi-Fi Module

Available Add-on Parts	
Part #	Description
SP178229	Duct Adapter
EEWRA631EW H	Wi-Fi Module



The new degree of comfort.®

Commercial and Multi Family

HEATING



COOLING



WATER HEATING



Commercial Gen 4 HPWH

Product



Commercially rated Heat Pump Water heater.

Warranty



3 year tank & parts Warranty

**Reasons
To Buy**



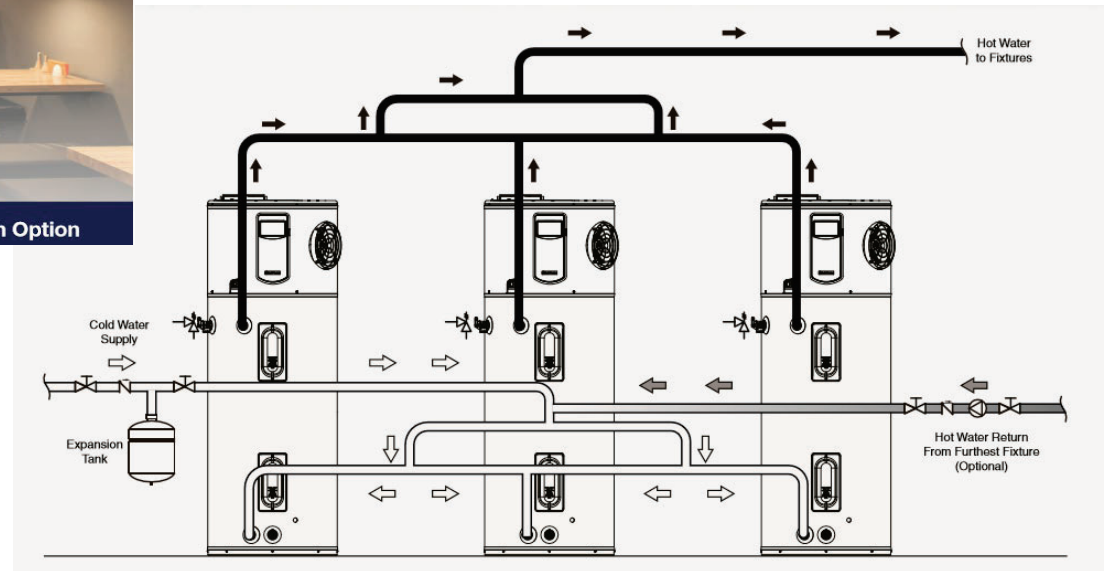
1. Light Duty Electric application
2. Pays for itself in less than 5 years*
3. Produces more hot water than regular electric water heater (non-sim)



*For a proactive replacement of existing unit. Pays for itself in less than 3 years when compared to hybrid replacement vs. a standard electric resistance water heater replacement.



Example of Multi Unit Install





Multi Unit Install with solar

**ARCATA, CA LED WITH THE FIRST 100%
SOLAR OFFSET APARTMENT COMPLEX
(2012) AND USED HEAT PUMP HOT WATER**





Multi Family Install with larger capacity

ZERO NET CARBON MULTIFAMILY IS GETTING TALLER WITH 80 GALLON HEAT PUMPS IN HALLWAY CLOSETS SUPPORTING 2 APARTMENTS

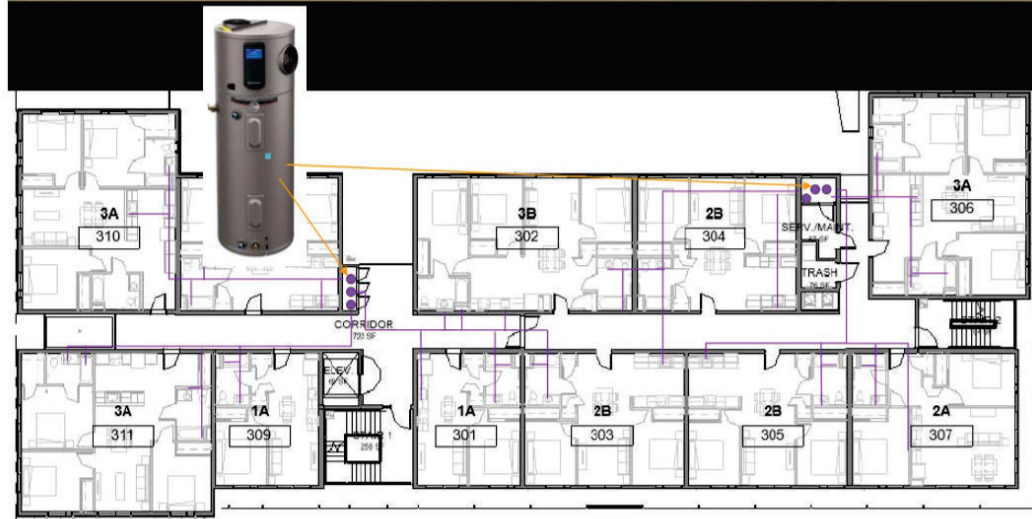


Coliseum Place in Oakland, by RCD



Hillandale Gateway in DC, by Duffie Inc.

GO LOW STEP 1: 80 GALLON HEAT PUMPS IN HALLWAY CLOSETS; 3/8" AND 1/2" COPPER FROM MANIFOLDS SUPPORTING 1-2 FIXTURES; MINIMAL BENDS, 26+ PSI MAINTAINED





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Questions?

HEATING



COOLING

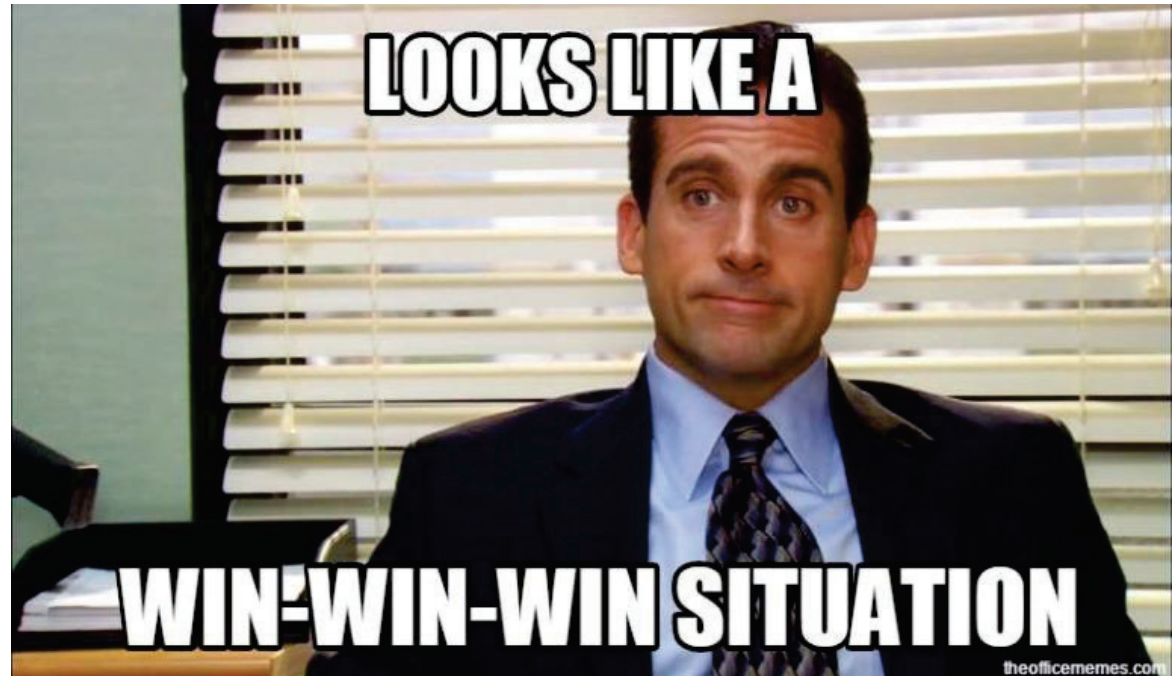


WATER HEATING



The Rheem Hybrid Wins:

- ***Highest Efficiency***
- ***Quietest***
- ***Install-ability***
- ***Connectivity***
- ***Leak Detection***
- ***Energy Savings Reports***
- ***Included Ducting Connection***
- ***Serviceability***
- ***Recovery***
- ***Available Models***



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Effect on Heating Systems



2017 NEEA study -
Interaction between Heat Pump Water Heaters or Other
Internal Point Source Loads and a Central Heating System

<https://neea.org/img/uploads/interaction-between-heat-pump-water-heaters-and-heating-system.pdf>

Northwest Energy Efficiency Alliance
PHONE 503-688-5400
EMAIL info@neea.org



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Competitive Comparison

HEATING



COOLING



WATER HEATING






Industry Leading Hybrid

	Rheem	Closest Competitor
UEF (hybrid mode)	3.55-3.70-3.70	3.42-3.52-2.73
Dimensions	61"x22.25"	63"x22"
Weight	178lbs	180lbs
FHR	67	66
dB (noise)	49	51
Compressor size	4200 btu/h	8300 btu/h
Warranty	10yr (very different)	10yr
Leak Detection	YES	NO
Connectivity/diagnostics	YES	NO
Side clearance required	None	6"
Ducting	No Kit up to 125'	Required Kit up to 10'



Competitive Comparison

			
Models (Gal)	50, 65, 80	50, 66, 80	50, 80
Control Panel	<input checked="" type="checkbox"/> Touchscreen	Digital w/LED	Digital w/LED
WiFi	<input checked="" type="checkbox"/> Integrated	N/A	N/A
Leak Sensor	<input checked="" type="checkbox"/> Yes	No	No
UEF	<input checked="" type="checkbox"/> 3.55	3.42	3.48
Sound DBA	<input checked="" type="checkbox"/> 49	Not Listed	55
Duct Adapter Kit	<input checked="" type="checkbox"/> Not Needed	Additional Kit	Additional Kit
Maintenance Alerts	<input checked="" type="checkbox"/> Yes	No	No
Contractor Contact Info	<input checked="" type="checkbox"/> Yes	No	No
Multiple Modes	<input checked="" type="checkbox"/> Yes	Yes	Yes
Works With Nest	<input checked="" type="checkbox"/> Yes	No	No
Warranty	<input checked="" type="checkbox"/> 10	10	10





Builder Model Competitive Comparison



Models (Gal)	50, 65, 80	50, 66, 80	50, 80
Control Panel	✓ Touchscreen	Digital w/LED	Digital w/LED
UEF	✓ 3.50/3.70/3.70	3.42/3.52/2.73	3.39/3.48
NEEA Tier	✓ Tier 3	Tier 1	Tier 1
Sound DBA	✓ 53	65	55
Maintenance Alerts	✓ Yes	No	No
Contractor Contact Info	✓ Yes	No	No
Multiple Modes	✓ Yes	Yes	Yes
Works With Nest	✓ Yes	No	No
Warranty	✓ 10	6	6

