BUYERS' GUIDE TO HOME ELECTRIFICATION

THINGS YOU NEED TO KNOW

Before You Buy a Heat Pump!

916.243.6430

villara.com Lic. 162634 4700 Lang Avenue McClellan, CA 95652 Brought to you by:





TRUSTED HOME SERVICE





Buyers' Guide to Home Electrification

We applaud your interest in moving away from fossil fuels and to "Clean, Green, Carbon-Free Electricity"! Your decision not only helps reduce the impacts of Climate Change for everyone, it also improves the quality of the air in your home, and it helps protect you from the ever-rising costs of fossil-fuel energy sources as state, national, and global agencies work together to "shut off the oil spigot"!

As you know, California leads the nation in its pursuit to *"Decarbonize"* our state, with a goal to be carbon neutral by 2050. While this goal is very ambitious, our government is taking unprecedented actions in order to accomplish it as conveyed in the following news headlines:

- · California Moves to Prevent New Oil Drilling Near Communities, Expand Health Protections
- · California Is Closing the Door to Gas in New Homes
- California plans to phase out new gas heaters by 2030
- California Air Resources Board requires all new cars, SUVs and pickup trucks sold in the state to generate zero tailpipe emissions by 2035.

There are 4 main consumers of Natural Gas within the typical California Home: Gas furnaces, gas water heaters, gas cooking, and gas clothes dryers. Gas furnaces and gas water heaters consume up to 93% of the natural gas used within the average California home, so it makes sense to focus most of our attention there. If you replace your gas furnace and AC system with a Heat Pump, and replace your gas water heater with a Hot Water Heat Pump, you've eliminated over 90% of your home's natural gas consumption!

So while it makes great sense to replace your aging furnace and water heater with Heat Pump systems, there are four things you need to know before you make this big and long term investment in your home, your comfort and health, and your global community. Here they are:

1. Traditional Heat Pump systems deliver cold, drafty air during the coldest days of the year!

Heat Pumps are wonderful appliances, and have been heating and cooling homes reliably and efficiently for over 70 years. (See our video on *"Heat Pumps – How They Work"* by scanning the QR code.)



Scan for Video

They however produce a serious comfort problem every 60 minutes or so when outdoor temperatures are below 45°: It is called the "Defrost Mode". In order to extract heat from 45° air, the Heat Pump's outdoor coil must be cooled to around 20°, which will cause it to ice up as it operates. This ice blocks necessary airflow through the coil, requiring the unit to switch into Defrost Mode in order to De-ice itself, about every hour. The only source of heat for this Defrost operation is the home, so....every hour the system actually switches into Cooling mode, extracting heat from inside the home to De-ice the coil. This means that just when you need heat the most, the system actually blows cold, 50° air into the space. This is what causes the cold, drafty conditions which generates frequent customer discomfort and complaints.

Most systems include an electric resistance heater inside the Air-handler to reheat this air to about 65° before it exits the supply registers. This at least reduces the amount of actual cooling taking place in the home during this 5-7 minute cycle, but....65° air still feels cold to 98° humans! Not only that, but this electric heat strip typically draws 5000 to 7500 watts of electric power, which increases your electric bill and reduces the overall efficiency of the heating cycle by 25%. Not want you signed up for!

2. Traditional Hot Water Heat Pumps take up to 7 hours to reheat a tank of water!

Hot water heat pumps can be very efficient, using a small compressor to extract heat from the air surrounding the unit and pumping it into a tank of water, similar to the gas water heater you may currently have. (See our short video on *"Hot Water Heat Pumps – How They Work"* by scanning the QR code.)



Scan for Video

Because the way these systems are designed limits the size of their compressors, it can take up to 7 hours to heat a cold tank of water from 60° to 120°. This can be quite frustrating if you're the last one in the hot-shower line!

Once again, most units incorporate an electric resistance heater inside the hot water tank to help reduce the recovery time to say 3 hours or less, but it comes at a cost in higher electric bills and peak electrical consumption, like the space heat pump system we just talked about.

3. The "solutions" to these two problems can increase your peak electrical load by 50%, driving your bill up and requiring major electrical system upgrades.

When you add the ~7500 watts for the electric heater in your Fancoil to the ~4500 watts in your Hot Water Heat Pump's tank, you've added 12,000 watts of load to your home's electrical system. If your home has a 200 amp main electric panel, that equates to 25% of its capacity; if you have a 100 amp panel, it is a whopping 50% of your total panel's capacity! You will not only have to run costly new wires to both systems to power these heaters, but you will often need to replace your 100 amp panel with a 200 amp panel, adding thousands of dollars to the cost of your installation. And you don't just have a higher first-cost; you will have to pay for the increased electrical consumption for the life of the systems.

4. Your overall cost of energy can actually go up, rather than down!

On top of the cost of operating these electric heaters, the reality is that today's cost of electricity is higher than the comparable cost of natural gas in some utilities. This can generate another very unpleasant surprise in the form of annual energy cost increases of almost 20% and hundreds of dollars per year. That makes it just a bit harder to step up and "do the right thing", doesn't it?

So after all this sobering news, what should we do? The possible choices include:

- 1. "I'll just keep babying my old systems along, hoping they don't have a fatal breakdown and missing out on the energy savings that new systems can bring". Or;
- 2. "I'll invest in a new gas furnace and water heater while they're still available, and hope that gas prices don't continue to explode...." Or;
- 3. I'm still in: I'm cutting the gas-line and moving to clean green electric Heat pump systems, and I'll learn to live with a little discomfort, inconvenience, and possible energy cost increases"....

Since none of these options sound ideal, we'd like to introduce an exciting fourth option that allows you to move forward with Home Electrification while overcoming the four concerns with traditional Heat Pumps we've shared with you:



The one system that provides all three: Heating, Cooling and Water Heating!

A one-of-a-kind Carrier-Villara system that integrates space heating, space cooling, and water heating in a way that resolves these major comfort complaints while simultaneously increasing operating efficiency! How does it do this? (See our short video on how AquaThermAire works by scanning the QR code.)



Scan for Video

1. Introducing AquaThermAire's radical re-design of the Defrost cycle.

Because AquaThermAire is still a Heat Pump system, it cannot avoid the need to defrost the outdoor coil when it is below 45°. However, because it is an integrated system that includes the Hot Water Heater, we now have a new source of heat to draw from.

Whenever the outdoor unit calls for *"Defrost"*, rather than pulling heat from the space as we explained earlier, AquaThermAire pulls heat from the 120° hot water tank. The benefits of this change includes:

- NO 50° 65° AIR BLOWING ON THE HOME'S OCCUPANTS!
- The defrost cycle time is reduced from 5-7 minutes to ~2 minutes. You won't even notice it!
- Because we aren't using electric resistance heating to avoid chilling the occupants, the operating efficiency of the system during cold weather is improved by ~20%.

And because AquaThermAire's "*Hot-Tank*" water heater has the equivalent of 64 gallons of thermal energy storage, the temperature of the hot water remains virtually the same, meaning your hot water supply is unaffected.

This is the biggest improvement in Heat Pump system comfort in the last 5 decades!

2. Size really matters: Carrier's large compressor reduces water heating recovery time by 85% or more!

Standard Hot Water Heat Pumps use very efficient, but SMALL compressors to move the heat into the Hot water tank, due to the limitations of their design. Most unit's compressor capacity is between 4200 and 4800 BTU's per hour. The Carrier compressor most often used in AquaThermAire is 48,000 BTU's per hour! This means we can reheat a full tank of water in under one hour, as compared to seven hours for a common Hot Water Heat Pump. This recovery speed is comparable to the gas hot water heater that you've come to love and rely on. NO GAS, NO PROBLEM!

3. AquaThermAire needs no more than your current HVAC electrical circuits to operate in most homes!

The Carrier-Villara AquaThermAire system is designed to use the existing wiring for your current gas furnace and AC unit. Because the electrical consumption of your current AC unit is higher than a new high-efficiency Heat Pump, we can even increase the system size in order to further reduce your winter heating costs. (Winter heating loads are higher than summer cooling loads, so a larger unit is more efficient year-round). And a nice benefit of this increased system size is the ability to withstand those ultra-hot summer days much better than your current system can.

There is no electricity required by AquaThermAire's Hot-tank water heater, because it gets all of its heat directly from the refrigerant. All of this means, no expensive electric panel upgrades, and no expensive new wires to run within your home!

4. Because AquaThermAire doesn't need electric resistance heating, you realize the cost savings you deserve, as you invest in new technology.

While "doing the right thing" for our environment is rewarding, you also deserve to reap a return on your investment. By reducing peak load by up to 12,000 watts, you can rest assured that the increase in your electric bill will be smaller than the huge reduction in your gas bill. It can and should pay to "Go Green"!

Welcome to "Carbon-Free Comfort"!

WHY VILLARA?

In closing, we would be remiss if we didn't address another very important question: why should you trust your home's comfort and energy affordability to Villara?

A short list of reasons that we think you'll appreciate include:

- 1. Villara has over **76 years of history** and experience in bringing affordable comfort to Northern California home owners. **Over 500,000 families** come home to "*Villara comfort*" every night!
- Villara has the multi-trade experience that you need, with active California contracting licenses as a General Building Contractor, a General Engineering Contractor, C10 Electrical (which covers Solar as well), C43 Sheet Metal, C20 HVAC, C36 Plumbing, and C39 Roofing.
- 3. Villara has in-house HVAC, Plumbing and Solar Design-Engineers that take the guesswork out of system designs.
- 4. With our HVAC, Plumbing, and Solar/Battery design and installation services, we can create a complete *"Home Energy Make-over"*, rather than taking a piece-meal approach.
- 5. Villara stands behind all of our work with a 100% money back guarantee, so we aren't happy until you are!



Please let us know how we can be of service. Call or email us at: **916.243.6430**, contactus@villara.com, or visit our website to learn more: **villara.com**

