ROSE & THORN HOME INSPECTION

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COMPARING 4 WAYS TO HEAT WATER FOR HOME USE.

ELECTRIC STORAGE TANK

INSTANT ELECTRIC WATER HEATER.

HEAT PUMP

SOLAR POWER

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What options are available to heat water?

Just what does it cost to heat water?

The cost to heat water in an electric tank. A typical electric water heater is 90.4 to 95% efficient. Let's call that 92.7% on average. So it takes 525 ÷ 92.7% = 566 Btu's to heat a gallon of water in an electric tank. One kWh is 3413 Btu's, so one Btu is 0.000293 kWh. 566 Btu's x 0.000293 kWh/Btu = 0.166 kWh.

A 20-gallon tank will cost 20 x 0.166kWh in energy. 3.32 kWh

With a kWh costing $.35 cent. That's $1.16 every time you heat up your 20 gallons of water.

Let's figure out your usage!

A regular shower head uses 7 to 10 gallons a minute, while a water-saving shower head puts out 2 to 4 gallons a minute.

We will go middle of the road on a water saving shower head at 3 gallons per minute.

So, you shower for 5 minutes. That uses 15 gallons. As it's SO warm here, let's go with 2/3 hot flow (2 gallons per minute) 1/3 cold flow (1 gallon per minute).

10 x .166=1.66 kWh x .35= $.58 per shower.

Four people in your home, we will go with the same numbers for time.

$2.3 per day. $16.27 per week $65.08 per month on water heating for showers.

If you have your water heater on a timer that h eats up for morning and evening. Same 20-gallon tank.

3.32 kWh twice per day. 6.64 kWh x .35 = $2.32 per day. $16.27 per week. $65.07 per month.

Interesting!

Rheem 20 gallon water heater.

Compare an ‘instant’ water heater.

This unit produces 1.09 gallons of hot water per minute.

Same math.

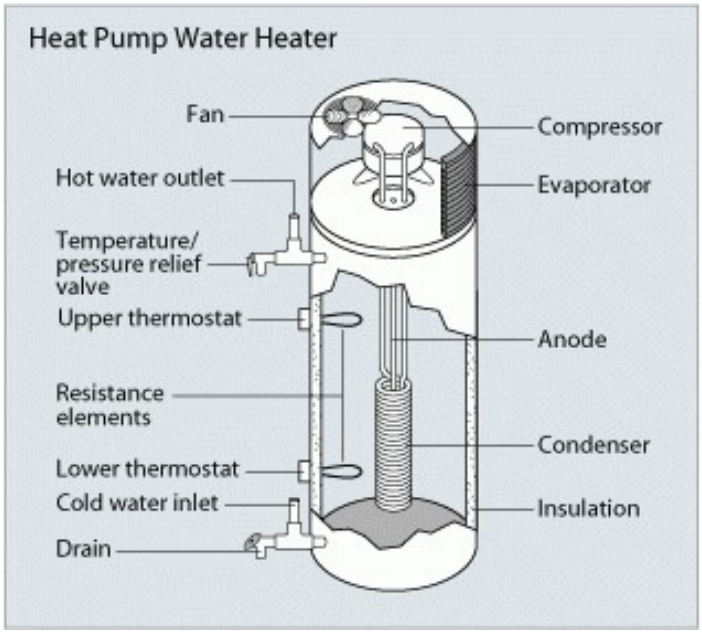
5-minute shower at full flow of hot water. $.34 per shower

Four people in the home. $1.27 per day. $8.87 per week. $35.48 per month.

Your hot water system is limited to 1.09 gallon per minute. Consider if two people are using hot water at the same time.

Also consider the size of your electrical system. Most homes on St. Croix have a 100 amp service. Be sure to check that you have enough power to operate one of these units.

Heat pump water heater.



Heat pump water heaters use electricity to move heat from one place to another instead of generating heat directly. Therefore, they can be two to three times more energy efficient than conventional electric resistance water heaters. To move the heat, heat pumps work like a refrigerator in reverse.

While a refrigerator pulls heat from inside a box and dumps it into the surrounding room, a stand-alone air-source heat pump water heater pulls heat from the surrounding air and dumps it -- at a higher temperature -- into a tank to heat water. You can purchase a stand-alone heat pump water heating system as an integrated unit with a built-in water storage tank and back-up resistance heating elements.

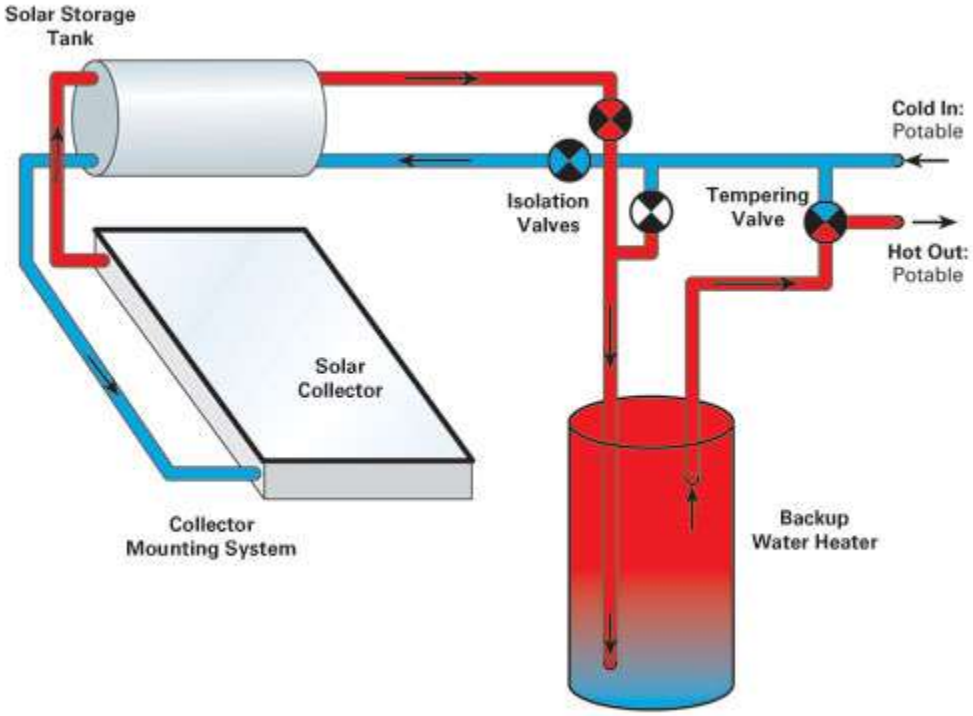
If we use 2 x more efficient to heat water. Operating costs using our 10 gallons of hot water per shower number from above.

10 x .166 = 1.66 /2 = .83 x .35 = $.29 per shower. $32.54 per month for hot water.

However, the initial cost of the unit will be higher than a regular water heater.

These units do require air flow and/or air space around them. They can't be installed in a closet. This unit will also require a drain, as a small amount of moisture is a byproduct of cooling the air (to heat the water) – much like the condensate from an AC unit.

Solar Water Heater.



A solar water heater is a device that uses the energy of the sun to heat water that is generally for home or building use. This type of alternative, renewable energy is one of the most common uses for solar energy. Depending on the type of water heater, there are several different ways in which it may work. Generally, all solar water heaters do three basic things: energy collection, energy transfer, and energy storage.

Collectors begin the process of heating water in a solar water heater by capturing energy from the sun. Three basic types of collectors may be used: batch collectors, flat-plate collectors, or evacuated tube collectors. Batch collectors heat the water in dark tanks, and store it there until ready for use. Flat-plate collectors use a series of parallel tubes to heat water, covered by a plate of glass. The evacuated tube collectors use an insulated bottle approach to heat the water, and are generally considered to be the most efficient way, but the startup costs are greater.

The circulation is another portion of solar water heaters that may be different, depending upon the model. Circulation can be done via a direct system, or an indirect system, which heats another liquid, and then transfers that heat to the water. Water can be transferred to the storage area either via a pump or by natural convection. Weather conditions, and type of collector being used, it may not be possible to supply water for an entire household using a solar water heater. If that is the case, then a backup water heater of some type, usually run by traditional electricity, can help make up the difference.

Drawbacks to the solar water heater system are generally the startup costs and the reliability of the hot water. Installation costs can run as high as five times that of a high-efficiency water heater running on traditional sources of energy. Further, to always ensure that hot water is available, some other type of water heater may also be required. If there is a power outage, and the owner is using a pump to transfer water to the storage area, that may be impossible.

As there is little to no cost if solar power supplies all your hot water, the cost of installation can be looked at over 10 years as the cost per gallon of hot water.