



Water Heating and Heat Recovery¹

Florida Power Corporation²

ENERGY-EFFICIENT WATER HEATING: IT'S THE EASIEST WAY TO SAVE ENERGY DOLLARS

Anywhere from 10% to 25% of the money you spend on home energy each year is consumed by your water heater.

Seem high? Not when you think about all the uses you have for hot water. Taking showers and baths, washing clothes and dishes, shaving, preparing food and just general cleaning - it all adds up.

The good news is, it's easy to save money through efficient water heating. And you can begin saving energy - and money - almost immediately. The following suggestions will help you save energy dollars - month after month.

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PART 1: ELECTRIC WATER HEATER EFFICIENCY

Improve the Efficiency of Your Water Heating System and Lower Your Energy Bills

Basically, your water heater is an insulated tank filled with water (Figure 1). Electric heating elements, controlled by thermostats, heat the water. When you operate a hot-water-using appliance or faucet, pressure forces the hot water out of the tank. It is then replaced with cold water which is heated for your next use.

How could this simple process be improved? There are several ways to get more hot water for your energy dollar:

Turning Down Your Thermostat is a Quick Cost-Cutter

Many manufacturers preset electric water heaters to maintain a water temperature of 140°F or higher. For most households, it doesn't need to be set that high. Lower your water heater's temperature to 120°F and you can reduce energy consumption by as much as 10%. (If you have an automatic dishwasher with a high temperature sanitizing cycle, 120°F should be sufficient. If your dishwasher does not have this cycle, set your water heater thermostat at 140°F.)

1. This document is PID 113 (488), from the Florida Power Corporation.

2. Florida Power Corporation, General Office: 3201 Thirty-fourth Street South, P.O. Box 14042, St. Petersburg, Florida 33733, (813) 866-5151.

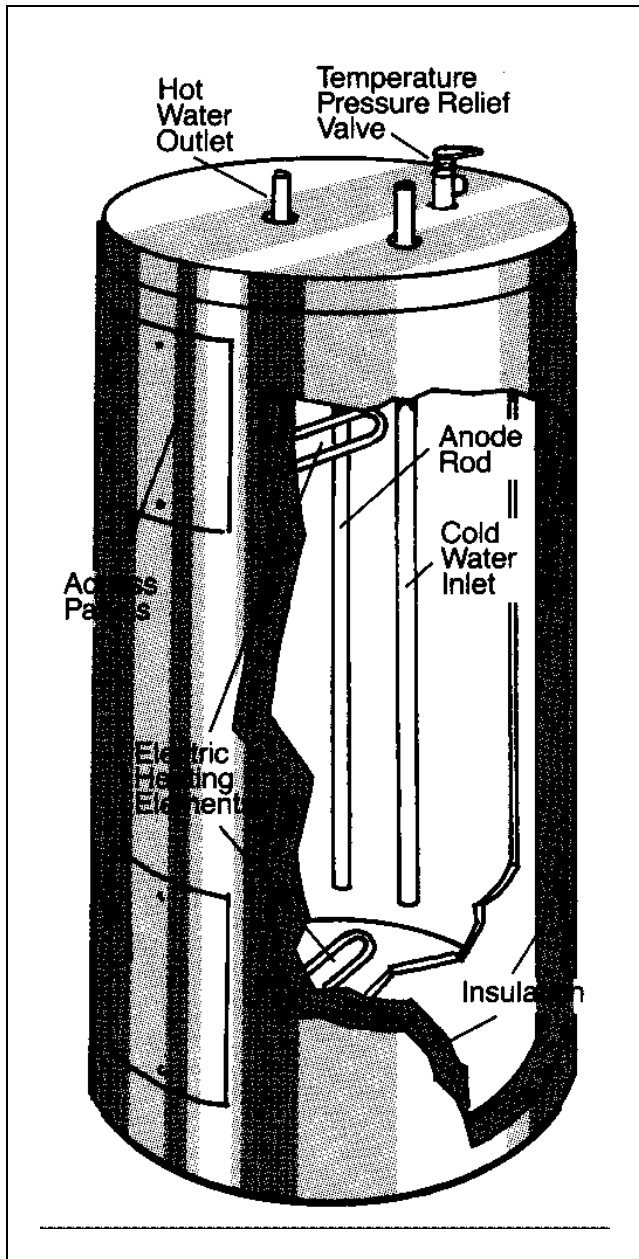


Figure 1. Insulated Water Heater.

Here's how

1. Turn off the electricity to the water heater at the fuse box or circuit breaker.
2. Remove the access panels and carefully part the insulation so you can see the thermostats (Figure 2). In general, older water heaters have one panel and one thermostat; newer models have two.
3. The thermostat will look similar to one of these shown (Figure 3). Insert a screwdriver into the slot and turn the indicator to 120°F or to the energy

efficient range. If you have two thermostats, be sure to adjust both of them.

4. Carefully replace the insulation and access panels.
5. Turn on the electricity to the water heater.

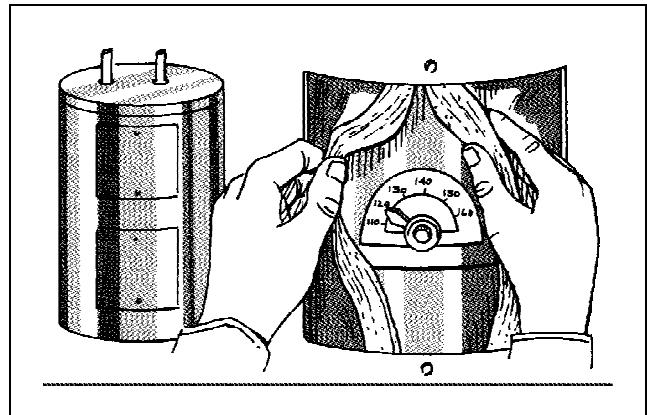


Figure 2. Water Heater Access Panels.

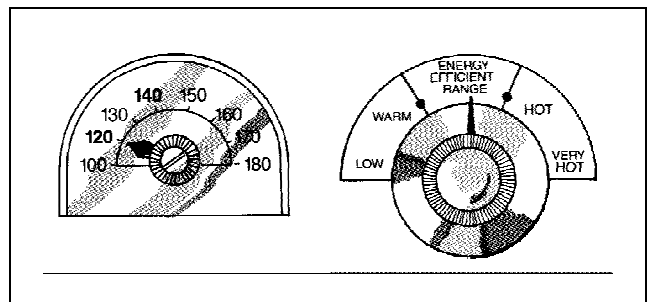


Figure 3. Water Heater Thermostats.

Insulate Your Water Heater to Save

True, your water heater already has a layer of insulation inside. But, just as an extra blanket or coat helps you maintain your body temperature, additional layers of insulation wrapped around your hot water storage tank help maintain water temperature better and longer.

Water heater insulating kits are available at building supply, hardware stores and similar outlets. The kit consists of a blanket of fiberglass insulation and comes with do-it-yourself installation instructions. Using this kit is convenient and may look neater, but you may find it more economical to buy blanket-type insulation and create your own water heater "jacket." Buying blanket-type insulation is not recommended for gas water heaters. For safety, use only an insulation kit.

Whichever method you choose, make sure enough material is provided for insulating the top of the water heater adequately. **(Do not wrap the top of a gas water heater.)** It is important to select insulating material with a rating of at least an R-6 for the sides and an R-8 for the top.

Insulate Water Heater Pipes for Added Savings

Not only does a water heater lose its heat through the sides and top of the tank, but also through hot and cold water pipes coming in and out of the tank.

So, whether you're installing a new water heater or improving your existing unit, insulating the pipes according to these guidelines will help you save energy dollars.

Here's how

1. Purchase tubular shaped insulation at any hardware store. The insulation pictured here (Figure 4) is a black rubber-like substance which comes in various sizes. Make sure you buy the size that snugly fits the pipes on your water heater; a 3/4" inside opening is most commonly used.

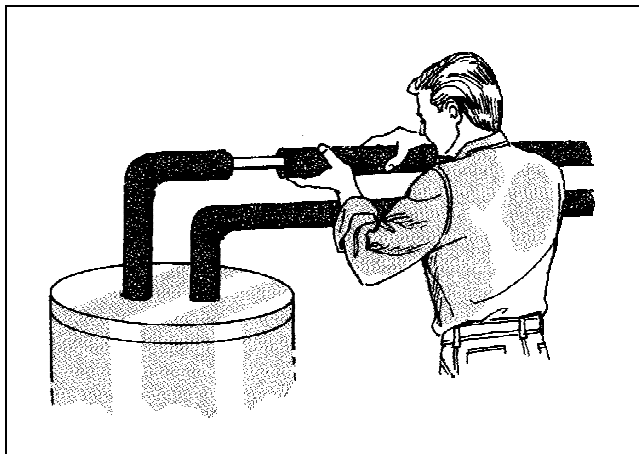


Figure 4. Tubular Pipe Insulation.

2. With existing hot water heaters, just slice open the insulation length-wise with a knife. Then wrap the insulation over the pipes and tape the seams with duct tape.
3. With new water heaters, it's easier to slip the insulation over the pipes *before* you hook the pipes to your heater.

4. Insulate pipes according to the diagrams (Figure 5). Remember, when the water heater is idle (no hot water being used), heat rises and is conducted to the top of the pipes and then along the horizontal runs. Since heat will not travel down vertical pipes, you need to insulate only a short distance. Also, it is not necessary to insulate past the first five feet of horizontal runs since little energy escapes here.

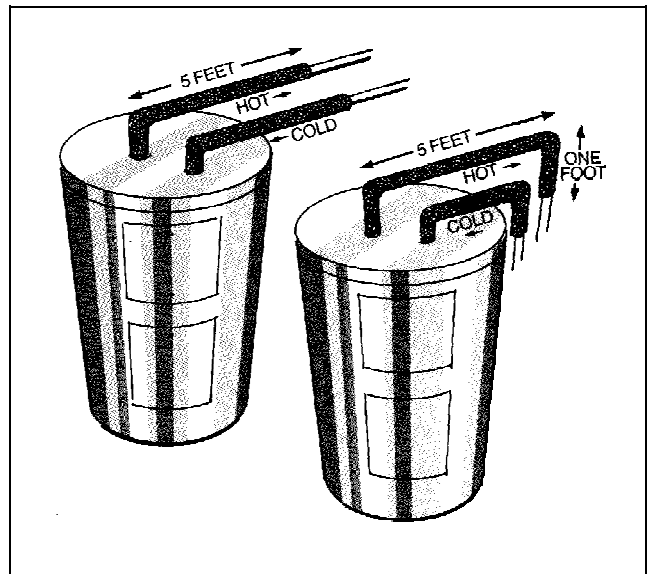


Figure 5. Insulating Water Heater Pipes.

NOTE: In the case of recirculating hot water systems (i. e., hot water constantly sent to each faucet and back via a circulating pump) the entire lengths of all pipes should be insulated.

More Quick Ways to Ensure Hot Water Efficiency

Fix leaky faucets. A leaky hot water faucet wastes water and the energy used to heat it. Watch how you use hot water and you won't have to watch your energy dollars go down the drain.

Use less water. Water flow restrictors (Figure 6) or "low-flow" shower heads can reduce water use by up to 60% while still providing satisfying showers. Restrictors placed in bathroom faucets can also reduce water use in most instances. These items are inexpensive and easy to install. In fact, water

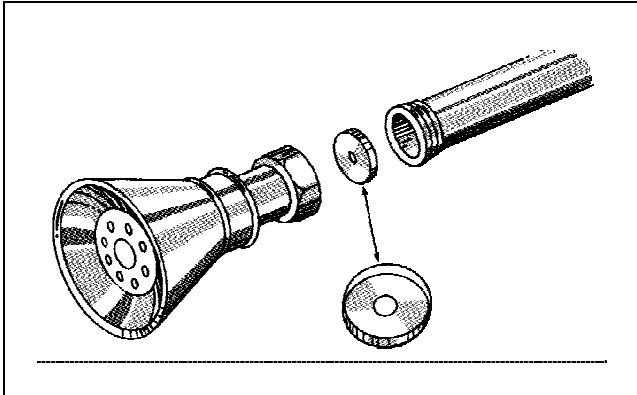


Figure 6. Water Flow Restrictor.

restrictors are available absolutely FREE from Florida Power!

Consider this when buying a new water heater. When you're in the market for a new unit, buy the "super-insulated" model. It may cost a bit more now, but you will save much more on energy bills in the long run. If you're searching for ways to cut costs when building a new home, it doesn't pay to scrimp on a water heating unit.

Start new habits. Take quick showers instead of baths. If you leave home for two days or more, turn off your water heater. And when washing clothes or dishes, wait until there's a full load. This saves the electricity that heats the water and runs the machines. You'll see the difference every month.

What about timers? Your water heater only uses energy when you use hot water or when the heater must replace the small amount of energy lost through the tank. Switching your water heater on and off manually or with a timer doesn't really save much energy. It only forces you into a fixed time schedule for hot water consumption. Use flow restrictors and an insulating jacket for real savings and take your showers whenever you want.

Use the Florida Sun to Heat Your Water

Florida may be the perfect place to take advantage of solar water heating units. You may have considered this energy alternative before, but thought you'd wait until the technology improves and/or the prices drop.

A complete factory-built and installed solar heating system currently costs between \$1,500 and

\$3,500. (Exact costs may vary depending upon the equipment and installation complexities.) Keep in mind, the major costs of solar equipment are materials and installation labor. So, odds are, prices for installing solar water heating units will not drop. Therefore, now may be the best time to carefully examine the solar water heating alternative for your home.

For More Information and Assistance on Solar Power, Contact

Conservation & Renewable Energy Inquiry & Referral Service

PO. Box 8900
Silver Springs, Maryland 20907
1-800-523-2929

Florida Solar Energy Center

300 State Road 401
Cape Canaveral, Florida 32920
305-783-0300

PART 2: HEAT RECOVERY UNITS

Heat Recovery Units Turn Hot Air Into Hot Water

Your air conditioner or heat pump works hard during hot weather. It pulls heat out of the air *inside* your home and discharges it into the air *outside* your home (Figure 7).

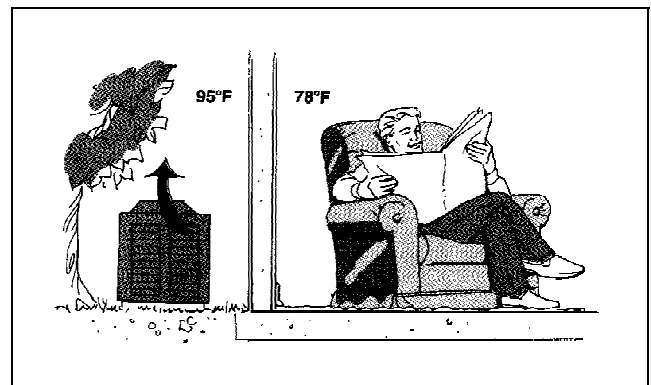


Figure 7. Summer Heat Discharge.

Meanwhile, your water heater is toiling away generating heat for your showers, dishwashing and laundry. Why not recover some of that unused heat energy discharged by your air conditioner or heat pump and use it to heat your water? That's exactly what a heat recovery unit does.

How Does a Heat Recovery Unit Work?

This simple device was developed by the people at Florida Power as an economical, energy-efficient means of heating water.

The heat recovery unit (Figure 8) is installed in the hot line of your air conditioner or heat pump's refrigerant circuit. The hot vapor flows through a heat exchanger. The heat from the vapor is then absorbed by the water, which is circulated through the heat exchanger by a small pump. This gives you inexpensive hot water. Controls keep everything operating properly.

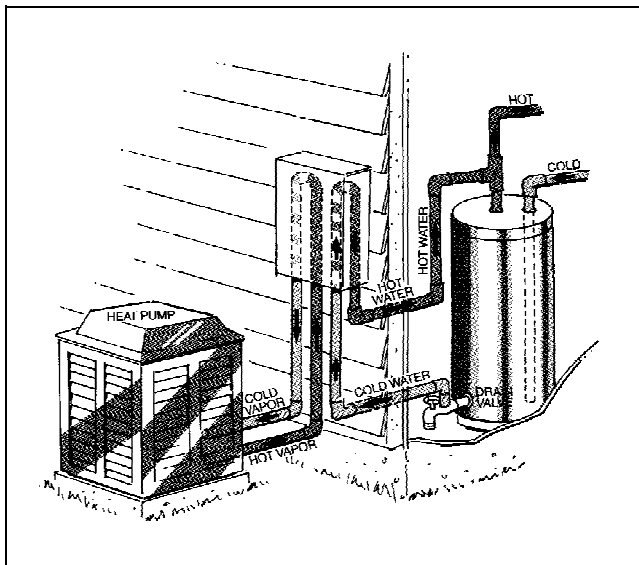


Figure 8. Heat Recovery Unit.

In the summer, the heat recovery unit captures some of the heat discharged by your air conditioner, essentially giving you free hot water. You can even turn your regular water heater off - just remember to turn it back on when you're not using your air-conditioner. If the heat recovery unit is installed on a heat pump, low-cost heating for your water during the winter months is also possible.

How Much Does It Cost?

It varies according to individual installation requirements. Purchase and installation costs usually range from \$300 to \$750. But, since the heat recovery unit could cut your water heating bills in half, it could pay for itself in approximately five years.

How Much Will I Save?

Using a heat recovery unit, an average family can save up to 50% on water heating costs annually. The amount of energy and money your family saves will depend on factors such as: the size of your family, your water use habits and your air conditioning usage. Table 1 can help you estimate the annual savings you can expect with a heat recovery unit.

Table 1. Heat Recovery Annual Savings. Based on \$0.08 per Kilowatt Hour.

NUMBER OF PERSONS	HOT WATER USAGE		
	Low	Medium	High
1	\$ 52	\$ 58	\$ 64
2	77	86	95
3	104	115	127
4	130	144	159
5	156	173	190

What's The Best Unit To Buy?

Look for a heat recovery unit with temperature and modulation controls. These features control the temperature and flow of water through the heat recovery unit into your water tank. Also, to minimize heat loss, select the smallest water lines possible for the recovery unit (preferably 3/8" diameter). And keep in mind that the closer your water heater is to your air conditioner or heat pump, the better. A distance of fifty feet or less is best for keeping heat loss to a minimum.

Who Installs Heat Recovery Units?

Call a qualified air conditioning contractor for information on how to have a heat recovery unit installed in your home. The unit should be installed according to instructions and recommendations from your heat pump or air conditioning manufacturer.

Also, check to see if installation of a heat recovery unit will affect the warranty terms of your cooling system. A properly installed heat recovery

unit will not adversely affect the operation of your heat pump or air conditioner.

Remember, whether you're building a new home or trying to reduce energy costs in your present home, a heat recovery unit can be a very practical investment.

Careful Energy Consumption Always Brings You Savings

Electric energy contributes greatly to the high quality of life found in Florida. Use it to your best advantage. This brochure offers lots of proven methods for increasing energy efficiency and stretching energy dollars. If you have additional questions, please call your nearest Florida Power office. We're always available to help you get the most out of electric energy.