



Going Green With a Solar Water Heater

Q: *I want to become more “green.” From what I have read, using a solar water heater makes the most sense, yet I don’t have much money for one. How can we build a simple one ourselves?*

A: Using solar energy in your home is about as “green” as living can get. Working on a project to build a simple solar heater is a great family project. Reducing electricity demand for water heating—especially during hot afternoons—can help reduce the need for additional power plants.

Other than solar swimming pools or spa systems, solar domestic water heating makes the most economic sense of all solar systems, because hot water is needed year-round and water has a high thermal mass capacity for storing the captured solar heat.

Heated water can be moved efficiently through insulated pipes without pumps. The normal house water pressure moves it through the solar system and into your house.

By contrast, whole-house solar space heating systems—unless you make a do-it-yourself window heater for one room—are not cost-effective for most of the country.

Since your budget is limited, building a simple batch-type solar water

heater is your best option. This is not as effective as an elaborate active solar system with an array of solar collectors on the roof, but it does not cost thousands of dollars, either.

Depending on the types of scrap materials you can find around the house, you can build a batch system for less than \$200. The savings will pay back its cost in a couple of years.

The water heating energy savings you can realize depend on the specific design and your climate. The sun is more direct in southern climates and less heat is lost to its warmer outdoor air.

During the summer, a 50-percent savings on your water heating costs is reasonable, as is a 25-percent savings during fall and spring.

In many areas of the country, it is best to bypass the solar heater during winter to avoid freezing and possible damage to the solar heater or plumbing.

A batch solar water heater is used as a preheater for incoming cold water before it reaches your standard water heater. If the incoming water is warmer, it takes less gas or electricity to heat it to the regular hot water temperature—120 degrees is best.

On a hot, sunny afternoon, the solar heater can



This do-it-yourself solar water heating kit uses a batch design to preheat incoming cold water.

warm water enough so the water heater stays off all day.

The most common batch solar water heater design uses a water tank inside of an insulated box with a clear top. Special solar water heating tanks can be purchased, but first contact local plumbers to find one or two old discarded water heaters that do not leak.

Strip off the sheet metal skin and insulation to expose the steel tank. It is easy to attach the plumbing because the old tank already has all the fittings and a pressure relief safety valve.

The water heater tank should be painted flat black. Special solar paints, which are formulated to absorb more solar heat,

are available. If you can find one, use an old glass storm door or window for the clear top, or buy a sheet of clear acrylic plastic.

For the greatest year-round solar gain, slope the top at an angle equal to your latitude.

Run the hot water outlet pipe from the tank through the back or side of the box, then down near the ground into your house to the water heater. Run an incoming cold water pipe from the water heater to the solar heater.

Insulate them well. Install a crossover pipe and two valves to bypass the solar heater during winter in cold climates.

The following companies offer solar kits and components:

- AAA Solar Supply, (800) 245-0311, www.aaasolar.com
- Alternative Energy Store, (877) 878-4060, www.altenergystore.com
- Build It Solar, www.builditsolar.com
- FLS Energy, (877) 862-5050, www.easysolarkits.com
- Solar Components, (603) 668-8186, www.solar-components.com ■



To ask a question, write to James Dulley, Energy Report, 6906 Royalgreen Drive, Cincinnati, Ohio 45244, or check his Web page at www.dulley.com.