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WILLIAM HURBLE

Solar water heating panels attractively integrated into the roof of a house.

Water heating is the second largest energy expense in your home—typically accounting for 14 percent of a residential utility bill. A solar water heating system can provide more than half of the hot water needs of a Wisconsin residence.

A solar water heating system consists of solar panels connected to a home's existing gas or electric water heating system, providing a renewable source for hot water. These systems are efficient, reliable and well proven for use in Wisconsin. Of all the active solar energy options available today, solar water heating systems provide the fastest return on your investment.

EFFICIENCY FIRST!

Before investing in any solar energy system it is important to take steps to make the existing hot water system as efficient as possible. Simple conservation steps can reduce the amount of hot water required and make the conventional equipment operate more efficiently. Good first steps are:

- 1) Install low-flow showerheads or flow restrictors in showerheads and faucets.
- 2) Insulate your current water heater and any hot water pipes that pass through unheated areas.

- 3) If you don't have a dishwasher, or your dishwasher is equipped with its own automatic water heater, lower the thermostat on your household water heater to 120°F.

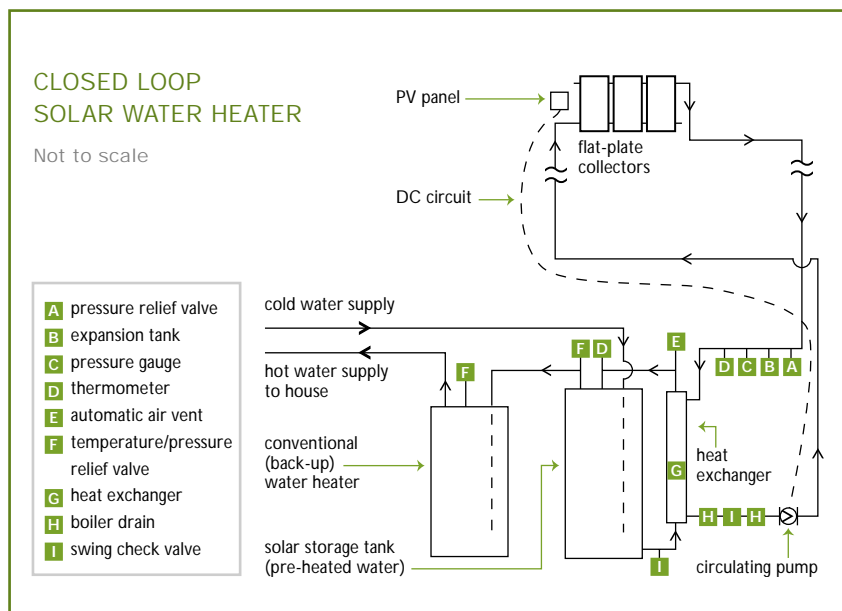
SOLAR ACCESS

You will also want to make sure your site has enough available sunshine to meet your needs efficiently and economically. Solar water heating systems must have a southern exposure. For maximum daily power output, solar collectors should be exposed to the sun for as much of the day as possible, especially during the peak sun hours of 10 a.m. to 2 p.m. Consider both summer and winter paths of the sun, as well as the growth of trees and future construction that may cause shading. The southern exposure should be free of obstructions such as trees, hills and buildings. Also, check with your city and county zoning offices and your homeowners association to find out about any local zoning laws or covenants that may restrict where you can place solar collectors.

SOLAR WATER HEATING BASICS

The main components of a solar water heater include collectors, a storage tank and a circulation system. The best type of collector for residential water heating is a flat-





This type of system is called a closed-loop solar water heater because the piping makes a big loop and is connected end to end. This loop is filled with solar fluid and sealed. Once sealed, the closed loop will remain closed except for periodic maintenance.

Closed-loop solar water heaters that use flat-plate collectors are very reliable and have a long and successful track record in Wisconsin. The collectors and insulated piping can last the life of the home. The circulating pump, the solar fluid and a few other minor components are subject to wear and will have to be replaced periodically. The system should be checked every five to ten years by a qualified service technician. Expect the average annual maintenance costs to be around \$25.

A typical two-panel solar water heater costs between \$5,000 and \$6,000. Typical return on investment, with current incentives averages between 3 percent and 8 percent (saving \$150–\$400 per year on fuel bills, depending on which fuel your conventional water heater uses).

FOR MORE INFORMATION

focusenergy.com

Contact Focus to learn more about smart energy choices.

The New Solar Home Book, B. Anderson and M. Riorden, Brick House, Amherst, NH, 1996.

Consumer Guide to Solar Energy, S. Sklar and K. Sheinkopf, Bonus Books, Inc., 160 East Illinois Street, Chicago, IL 60611, 1991.

"Solar Water Heating Technical Spec Sheet," Wisconsin Public Service Corporation, 1999.

plate collector. It is an insulated aluminum box with tempered glass on the front. Behind the glass is a flat black plate that has a grid of copper pipes attached to it. Insulated pipe connects the collectors to a liquid-to-liquid heat exchanger inside the storage tank. The storage tank stores the solar-heated water. This insulated tank is usually slightly larger than your existing water heater.

A mixture of water and non-toxic antifreeze called solar fluid fills the collectors and all the piping. When the sun is shining on the collectors, the solar fluid absorbs the solar energy and gets hot. A pump circulates the solar fluid from the collectors through the insulated pipes to the heat exchanger. The heat exchanger transfers the heat from the solar fluid to the water in the storage tank. This pre-heated water then supplies your conventional water heater.

Focus on Energy is a public-private partnership offering energy information and services to energy utility customers throughout Wisconsin. The goals of this program are to encourage energy efficiency and use of renewable energy, enhance the environment, and ensure the future supply of energy for Wisconsin. For information about the Focus on Energy services and programs, call 800.762.7077 or visit focusenergy.com.

Solar water heating systems have a good economic payoff, and are manageable systems to install or build as a DIY project. Some of the solar water heating designs are very simple and low cost. You can save as much as \$7000 by building your own system. There are just over one hundred projects with full construction details listed below -- all free. The projects range from simple batch heaters for warm climates through closed loop and drain back systems that will work in any climate. One of the systems is our own \$1,000 solar water heating system that has provided a solar fraction in excess of 90