First Cost, Incentives, and Savings

Before incentives, the typical installed cost for a two-panel household solar water heating system today runs between $5,000 and $9,000, depending on the level of freeze protection and other features. Whatever the installed system cost, you may be eligible for a 30 percent cost reduction, thanks to the federal tax credit on solar, which now applies to the installed cost (within guidelines) of the system. Customers in some states or counties may qualify for additional, state or local incentives. Check the national database of incentives for renewable energy (www.dsireusa.org) to see if you qualify.

To Find Out More

If you have access to the Web, check out these sites for more information, or ask for publications at your local public library.

- U.S. Department of Energy, Office of Energy Efficiency and Renewables
  www.energysavers.gov
- Solar Energy Industries Association
  www.seia.org
- American Solar Energy Association "Find Solar"
  www.findsolar.com

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TRI-COUNTY ELECTRIC
A Touchstone Energy™ Cooperative

SOLAR WATER HEATING: A GUIDE FOR ELECTRIC CO-OP MEMBERS

Solar water heating works well on a wintry Colorado day.

The Power of Community

TRI-COUNTY ELECTRIC
A Touchstone Energy™ Cooperative

About Solar Water Heating

If you're interested in solar energy, you might find that solar water heating is the simplest and most cost-effective way that you can put this renewable resource to work. New solar industry standards promote quality products and installations, and new federal solar tax credits can take 30 percent off the installed cost of solar water heating for your home or business.

A solar water heater is designed with a dark, heat-absorbing material inside a collector— a glazed box or tube. A heat-exchange fluid passes through the collector, gets hot, and then runs through a heat exchanger, which transfers the heat to the water in a storage tank. In the United States, a typical solar water heating system is likely to meet more than half of a household's water heating needs over the course of a year.

Don't confuse solar water heating (SWH) and solar electric systems (also known as photovoltaics or PV). PV is high-tech. It uses a semiconducting material to convert sunlight into electricity. By comparison, solar water heating is low-tech. It puts the radiant heat energy of the sun directly to work, heating water for household or commercial use.

For best results, solar panels should face south, within 15 degrees. They should be unshaded year-round and for years to come. Some people forget how quickly trees will grow or how long the shadow of an evergreen tree can be.

Which System Design Is the Best for You?

Closed-loop antifreeze systems

Closed-loop antifreeze systems use an antifreeze heat transfer fluid in the collector as freeze protection under harsh winter conditions (Figure 2). A circulating pump, powered by household electricity or by a small PV panel, moves the heat

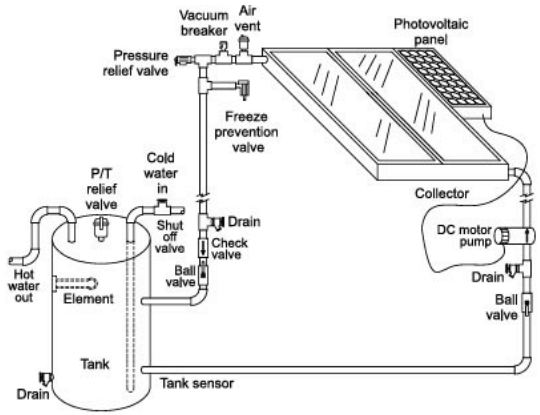

FIGURE 1: A closed-loop antifreeze system.

transfer fluid through the system. A heat exchanger transfers heat from the fluid to the household water. In four-season climates, this is the most popular generic design.

Closed-loop drainback systems

Closed-loop drainback systems use distilled water with a corrosion inhibitor as the heat transfer fluid that circulates through the collector. Like the antifreeze system, this configuration uses a heat exchanger, so the collector fluid does not mix with household water. When this system is operating, a drainback tank is mostly filled with air. But when the heat transfer fluid cools below a useful temperature, it drains into the drainback tank, forcing air into the collector and protecting the system from freezing. Drainback systems are most useful in climates where freezes are infrequent and mild.

Open-loop direct systems

Open-loop direct systems heat and circulate household (potable) water directly through the collectors. One type of open-loop system is a batch heater—simply a tank filled with water and placed on the roof either in a glazed box or attached to a solar collector panel (Figure 2). This type of heater has few parts, and thus it is generally reliable. However it must be protected from freezing or

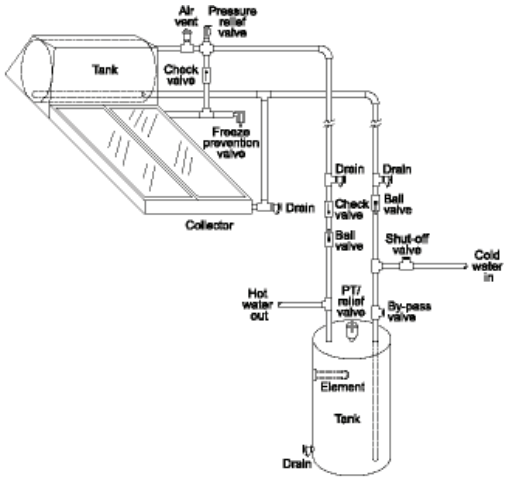

FIGURE 2: Solar batch water heater. Household water runs into the tank on the roof and is heated directly.

drained for the winter. The design is common for do-it-yourself projects that serve summer homes or workshops.

Shopping Tips

Your electric cooperative is one source of information about qualified solar equipment dealers. Others include your state or regional chapter of the Solar Energy Industries Association, state energy office, or a Web site that is cosponsored by the American Solar Energy Society and U.S. Department of Energy, at www.findsolar.com.

Of course, you should be confident in the equipment as well as the installer. Solar water heating equipment is routinely tested by the Solar Rating and Certification Corporation. The Florida Solar Energy Center and a few other test agencies offer similar ratings that are considered acceptable in some states. Recently, the U.S. Environmental Protection Agency's Energy Star program (www.energystar.gov) began to label solar water heating equipment and other energy-efficient water heaters.