

Solar Water Heating for Your House

A CONSUMER'S GUIDE



Turn on a garden hose that has lain in the sun for a while and feel how warm the water is that first comes out. That's solar-heated water with free energy (Btu's) from the sun. You can apply the same heating principle to your home's water supply.

Today's solar water heating systems have come a long way in terms of aesthetics, reliability and longevity; and they require very little maintenance. Because about 20 percent of the average home's energy usage can be devoted to heating water, a solar water heating system can cut back your energy costs year-round. Typically, a properly designed solar hot water system can save 50 to 75 percent of the usual utility cost for residential hot water.

A solar water heating system can cost between \$6,000 and \$8,000 installed, depending upon a variety of factors, such as the location, type and sophistication of the system. Both the state of North Carolina and the federal government offer

tax credits to homeowners and businesses as an extra incentive to those who install certified solar water heating systems (that's a tax "credit" which directly reduces your tax bill). Combined, these tax credits may offset the cost of the average system by about 50 percent. With these incentives, most systems pay for themselves within about seven years, and afterwards continue to heat your water with free Btu's.

Solar technologies also can add value to your home. Many Americans say they would pay a premium for a solar-equipped home. And as energy prices continue to rise, homes with energy-saving features gain value. Solar water heating systems offer that value. Many systems have an expected life-span in the 30-year range.

Drainback and Pressurized Systems

There are two primary types of solar water heating systems: drainback and pressurized. Both use electric pumps to circulate a heat-transfer liquid (such as a glycol-water mix) through roof-mounted collectors, and they rely on heat exchangers to transfer the heat to the home's water supply. (It is important to note that the glycol-water mix and your home's water supply never mix, because they each run via a closed loop.)

While drainback and pressurized systems are about equivalent in terms of efficiency and reliability, drainback systems are more common. A drainback system drains its fluid during extreme high or low temperatures to prevent freezing or overheating of the roof-mounted solar panels, while the fluid is always present in a pressurized system's collector panels. The pressurized system avoids overheating or freezing by using glycol instead of water in the solar collector.

Check your location

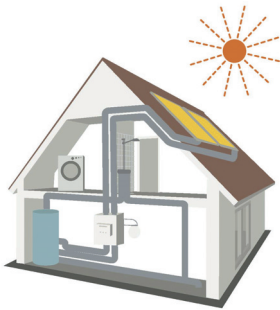
What should you think about before investing in a solar system? First, determine if your site gets good solar exposure. A roof facing in a southerly direction with no shading is best, but it's not an absolute requirement. As long as you have a southernish-facing spot that gets direct sunlight for at least four hours a day and is large enough to hold your solar collectors (about 64 square feet), you should be able to find a solar solution that works for you.

On cloudy days, your back-up heating element (which is included in certified solar water heaters) will kick in to ensure you have hot water whenever you need it. As another option, you may choose to keep a conventional water heater as additional storage for solar-heated water.

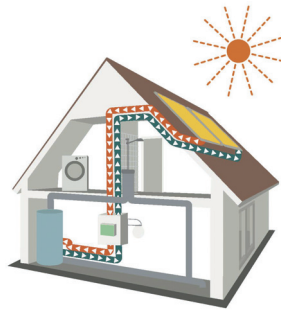
Obstructions to sunlight may be less of an obstacle than certain characteristics of your house. When discussing a system with an installer, ask these questions:

- **Piping:** How difficult will it be to route pipes from the collectors on your sunny roof to the solar water storage tank in the attic or basement? Will sections of wall or floor need to be cut open?
- **Storage tank:** Is there room in the basement or on the ground floor for a solar storage tank that measures 3 feet in diameter and 6 feet in height? Ideally, it will fit near your water heater. Can it be brought through your stairways and doors?

Example of how an active solar water heating system works.



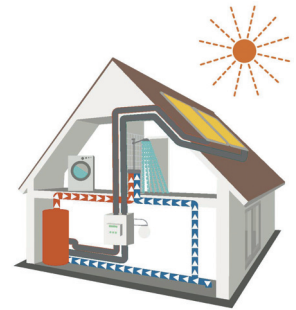
1 Sun heats up liquid inside collectors.



2 Controller pumps hot liquid to the water tank.



3 Hot liquid heats up water inside the tank.



4 Hot water is available for household use.

- **Working conditions:** If you are planning for a roof-mounted collector, is there easy access to the attic? What about the slope and accessibility of the roof? Could an installer work there?
- **Roofing materials:** Can the collectors' supports be readily fastened to the roof? Shingles are easy. Slate and clay tile, which are brittle and chip easily, require extra care.
- **Aesthetics:** How will the collectors alter the appearance of the house? Will you like the way it looks? Will neighbors object?
- **Code requirements:** Does your town, county or homeowners association have any zoning or code requirements affecting solar water systems?

Installation

Find a reputable contractor to design and install the system that's right for your home. Make sure they're fully licensed and insured, and that they warrant and service everything they sell. Ask for references, and make sure they have a 100 percent customer satisfaction guarantee. Ask these questions:

- Does the company have experience installing and maintaining solar water heating systems, especially the kind recommended for your place?
- How many years of experience does the company have with solar heating installation and maintenance?
- Does the company have a plumbing license? Confirm licensing with the North Carolina licensing board. The N.C. Plumbing and Heating Board can also tell you about any complaints against state-licensed contractors. North Carolina State Board of Examiners of Plumbing and Heating Contractors. 1109 Dresser Court, Raleigh, NC. Phone: (919) 875-3612. www.nclicensing.org.

The North American Board of Certified Energy Practitioners establishes standards and educational opportunities for solar thermal installers. Check your installer's status at www.nabcep.org.

Maintenance

Discuss maintenance requirements with your system provider, and consult the system's owner's manual. Plumbing and other conventional water heating components require the same maintenance as conventional systems. Regular maintenance on simple systems can be as infrequent as every three to five years, preferably by a solar contractor. Systems with electrical components usually require a replacement part or two after 10 years.

Once your system is up and running, you'll feel good knowing you're doing your part to reduce greenhouse gas emissions—not to mention your power bill. You could even see a welcome reduction on next year's tax bill—saving money, saving energy and saving the environment. 🌱

Resources:

Division of Energy Efficiency and Renewable Energy, U.S. Dept. of Energy. www.eere.energy.gov.

North Carolina Solar Center. www.ncsc.ncsu.edu.

Database of State Incentives for Renewables and Efficiency (DSIRE). www.dsireusa.org.

Thanks to Southern Energy Management and Velux for resource help and graphics. Southern Energy Management is a leading provider of sustainable energy services in North Carolina. (866) 575-9191. www.southern-energy.com.