

# Investing in Solar Thermal Technology

## Why should I **invest** in a solar thermal system?

The first question many people ask when considering a home expense is, "How much will it cost?" The answer depends on the type of system, how you want to use it (water or pool heating, for example), and your geographic location. Most solar thermal systems cost between \$1,500 to \$4,500. After installation, the total cost can be as much as \$8,000. Although this is usually more than the cost of a conventional gas or electric system, today's solar heating systems have a lifespan of 25-30 years and are cost competitive when you consider your total energy costs over the entire life of the system.

Your monthly gas or electricity bills will usually be lower and more predictable for as long as you own the house. Also, solar heating systems will insulate

you from rising fossil fuel costs and protect you from fuel-price inflation over time. The average annual savings is 60-70 percent off the current cost of water heating, which translates to hundreds of dollars in savings. With accumulated tax credits and energy savings, your residential system could pay for itself in under 10 years.

The U.S. Department of Energy estimates that over 1 million U.S. homes have had a solar hot water system installed.

If you are building a new home or refinancing your present home, the savings could be even more attractive.

Investing in a solar thermal system is not likely to increase your property taxes and could increase the resale value of your

home. Often, the entire initial cost of the system can be recovered when you sell your property. According to the National Remodelers' Association, adding a solar water heater to your home raises resale value by the entire cost of the system. In addition, you could be earning an annual 6 percent to 25 percent tax-free rate-of-return on your investment, depending on how much energy you save.

Another important reason to invest in

solar systems may be less tangible. When you purchase a solar heating system, you support technologies that are good for the environment. You are making a conscious, responsible decision to help reduce harmful emissions from fossil fuels, while maintaining your quality of life.

## How much will your solar heating system help the environment?

Depending on the type of conventional fuel used, replacing an electric water heater with a solar heater can offset the equivalent of 40 percent to 100 percent of the carbon dioxide emissions of a modern passenger car. Installing just one solar thermal collector can reduce CO<sub>2</sub> levels as much as planting more than 200 trees and is the perfect choice for people wanting to become part of the solution for global warming by reducing their carbon footprint.

Carbon dioxide traps heat in our atmosphere, contributing to the greenhouse effect, which may alter our planet's climate and ecological systems. Using solar energy in place of nonrenewable fuels also reduces nitrous oxides and sulfur dioxides, which are components of smog.

## How have solar systems improved?

Since the early 1970's, the efficiency and reliability of solar heating systems and collectors have increased greatly and costs have dropped. Improvements to materials, a rating system for consumers, and more attractive designs have all helped to make systems more successful.

In recent years, the production volume of evacuated tubes has increased significantly, resulting in lower manufacturing and material costs. The result is that evacuated tubes are now similar

in price to flat plate collectors.

Low-iron, tempered glass is now used instead of conventional glass for glazing. Improved insulation and durable selective coatings for absorbers have improved efficiency and helped to reduce life-cycle costs.

The Solar Rating and Certification Corporation (SRCC) and the Florida Solar Energy Center (FSEC) certify and rate solar thermal systems and equipment.

Energy Star is another certifica-

tion program that was established by the U.S.

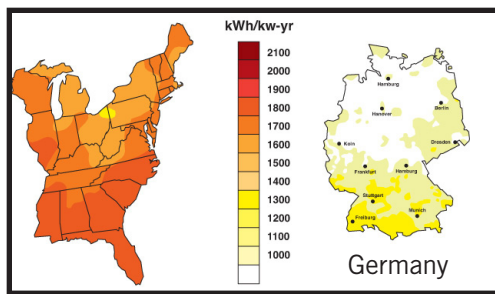
Environmental Protection Agency and the U.S. Department of Energy that is designed to help save money and protect the environment through energy efficient products and practices.

SRCC is the key solar collector certifying body for the U.S. and Canada. SRCC evaluates product reliability and rates the performance of solar water-heating systems by subjecting them to

technical reviews.

SRCC has a directory of certified systems on its Web site, along with system performance ratings. FSEC publishes similar information specific to Florida that is useful in other states with similar climates. In January of 2009, Energy Star released its first line of approved solar thermal collectors and system components. See the "Getting help" section for contact information.

Germany's solar resource is less than Ohio, but Germany leads the world in solar energy production.

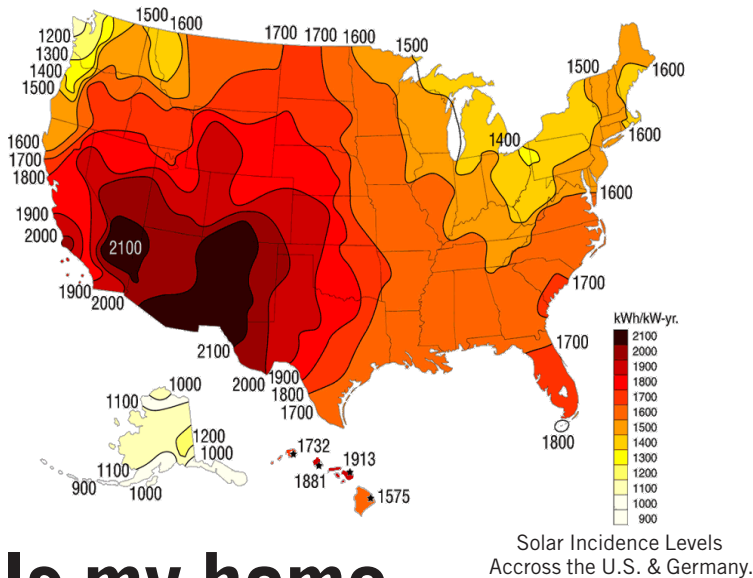


Solar can work anywhere the sun shines, especially in Ohio. Solar thermal systems are reliable, pollution free, and use a renewable source of energy. Cloudier conditions due impact the performance, but solar thermal systems can still produce heat for domestic hot water or space heating needs. Ohio gets about 60% of the sunshine received in Arizona. Various parts of Ohio receive between 4 and 5 full sun hours per day (yearly average). Your average sun will tell you how much energy you can expect to generate with your solar system.

ceptable even though not ideal. Trees, roofs cables, chimneys, buildings and other structures can obscure the light rays and decrease the productivity of the solar thermal system. Ohio law allows property owners to create binding solar easements for the purpose of protecting and maintaining proper access to sunlight.

To make the best use of your solar thermal system in Ohio, it should face south with an unobstructed access to the sun but an east or west facing roof may also be ac-

In Ohio, most of the sun's energy is available between 9 AM and 3 PM. Shading tends to be worst in winter. On December 21st, the sun is at its lowest point in the sky, and shadows are biggest. On June 21st the sun is at its highest, and shading is less of a concern. Professional solar installers can evaluate the solar potential at your site any time of the year.



## Is my home a good place for a solar heating system?

The first consideration when building a solar thermal system is the site. If your site has unshaded areas and generally faces south, it is a good candidate for a solar thermal system. A professional installer can evaluate your roof as a location for collectors. If your roof doesn't have enough space, you can also install the system on the ground. Please refer to the system-sizing section of this booklet for more information on space requirements. The amount of sun that your site receives, how often

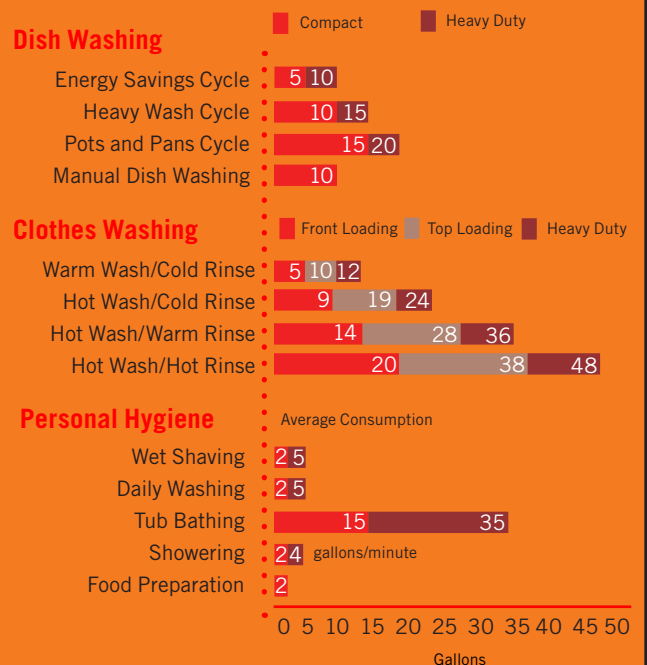
temperatures dip below freezing, and other factors will also affect the type of solar heating system you choose.

Before getting under way, you need to consider your homeowner's association rules and neighborhood bylaws, also known as codes, covenants, and restrictions (CC&Rs). Some cities and counties have ordinances or require permits for home improvement construction, including solar system installation.

## How big should my solar thermal system be, and which features should I look for?

Some of the answers to questions about system size and features depend on how you plan to use the solar system. Here, you'll find general information on sizing systems for water heating, swimming pools and space heating. To locate more specific information, please see "Getting Help" on page 29.

### Average Residential Consumption Chart



### Collector Sizing Chart

Number of People in Household					
1	2	3	4	5	6
Size of Solar Storage Tank					
40 gal	40 gal	60 gal	80 gal	90 gal	100 gal
Square Feet of Collector for Ohio					
32-40	32-40	48-60	64-80	72-90	80-100

Charts found in "Solar Hot Water" by Bob Ramlow