

Solar hot water benefits for commercial businesses

FACT SHEET



BIOMASS



SOLAR



WIND

Contact Focus on EnergySM to learn about renewable energy options for your home, business or organization. Full program details, applications for awards and eligibility requirements are available from the Renewable Energy Information Center. Call 800.762.7077 or visit focusonenergy.com.



PHOTO: KALAHARI RESORT & CONVENTION CENTER

Designed and installed by Terrytown Plumbing, with assistance from Hot Water Products, this 104-panel solar hot water system atop the Kalahari Resort & Convention Center, Wisconsin Dells, is visible from Interstate 90-94. It provides over 3,000 gallons of hot water per day.

More and more, Wisconsin businesses that use large volumes of hot water are discovering that solar hot water systems can save money in a variety of commercial applications—and benefit the environment as well. A proven technology that's been in use for decades, solar hot water systems are well suited for use in Wisconsin all year round.

THE ECONOMIC BENEFITS OF SOLAR HEATING

Solar hot water systems can be a smart investment for business owners because the energy cost savings pay for the up-front and operational costs of the system. Depending on the application, the internal rate of return (IRR) for solar hot water systems can be as high as 20 percent. Another attractive financial benefit of solar hot water systems is that costs do not fluctuate like those of other fuels—making today's robust, reliable systems a viable shield against ever-rising energy costs.

SOLAR WORKS WELL IN WISCONSIN

Sunshine is free. As an energy source, it doesn't have to be bought, mined, refined or transported. The sun

is also quite reliable. Wisconsin is mostly sunny for six months of the year. The rest of the year is sunny about half of the daylight hours. November and December are the cloudiest months. Because of these seasonal fluctuations, solar energy is not designed to provide 100 percent of a facility's hot water needs. But because solar hot water systems are able to preheat Wisconsin's cold potable water so efficiently, and because they are built to withstand freezing temperatures, solar hot water systems can be a good investment even in our northern climate.

ENVIRONMENTAL BENEFITS

Solar hot water systems produce pollution-free energy for water heating, which helps to offset the environmental costs of other heating fuels. Every square foot of a solar collector reduces net carbon dioxide by more than 23 pounds for each year the system operates.

Plus, by marketing the environmental benefits of your solar investment, you can enhance your company's reputation as an environmentally friendly business and enjoy the positive public perception that brings.



PHOTOS THIS PAGE: COURTESY OF KALAHARI RESORT & CONVENTION CENTER



These photos show the Kalahari Resort & Convention Center, the pre-insulated piping that carries solar fluid from the solar panels to the Kalahari's hot water supply, and the 500-gallon pre-insulated storage tanks containing the solar heated water.

HOW SOLAR HOT WATER SYSTEMS WORK

Solar hot water systems consist of three major components: the solar collectors (panels), a storage tank and a circulation system. Insulated pipes connect the collectors to a liquid-to-liquid heat exchanger which is plumbed to the solar storage tank. This tank, which is usually slightly larger than a traditional water heater, stores the solar-heated water and supplies it to the existing water heater.

Most cool-climate solar hot water systems circulate a non-toxic antifreeze mixture to heat water in the storage tank. When the sun shines on the collectors, the fluid absorbs the solar energy and becomes hot. A pump circulates the fluid from the collectors through the insulated pipes to a stainless steel or copper heat exchanger, which transfers the heat from the fluid to the potable water in the tank (see diagram, page 3). The fluid is then pumped back to the collector and the process begins again.

SITING, INSTALLATION AND MAINTENANCE

Solar hot water systems require adequate sun exposure to operate efficiently. For optimal performance in our climate, solar collectors should be mounted to face the south and should not be shaded between 9 a.m. and 3 p.m. The panels are also typically mounted at an angle between 45 degrees and 60 degrees for ideal exposure and to allow snow to slide off the surface.

For roof-mounted systems, the roof structure must be strong enough to hold a solar array, and the panel array itself must be installed to withstand local winds. A structural engineer may be involved to verify the roof's ability to support a solar collector array.

Solar hot water systems use standard plumbing and heating components and require similar installation practices. Today's solar collectors are very durable, and with proper installation and maintenance, can last indefinitely. Like any equipment with moving parts, solar hot water systems require periodic maintenance, but this is generally minimal.

APPLICATIONS

Solar hot water systems can be used for both space heating and water heating. A business that uses large quantities of hot water may see an immediate decrease in total monthly energy costs. Businesses that enjoy the best return on a solar hot water investment are those with consistent, year-round hot water needs, such as:

- Healthcare facilities
- Hotels and motels
- Health clubs and spas
- Restaurants and bakeries
- Apartment buildings
- Fire stations, correctional facilities and other similar government facilities
- Agriculture, food processing and other similar industries
- Water parks and campgrounds
- Car washes
- Laundries and laundromats

SYSTEM SIZING

As with any heating system, proper sizing is important. Heating loads should be analyzed to determine the appropriate system size for your business. Site assessments and computer modeling programs can help (see next section).

A SOLAR WATER HEATING SYSTEM FOR A TYPICAL SMALL COMMERCIAL APPLICATION

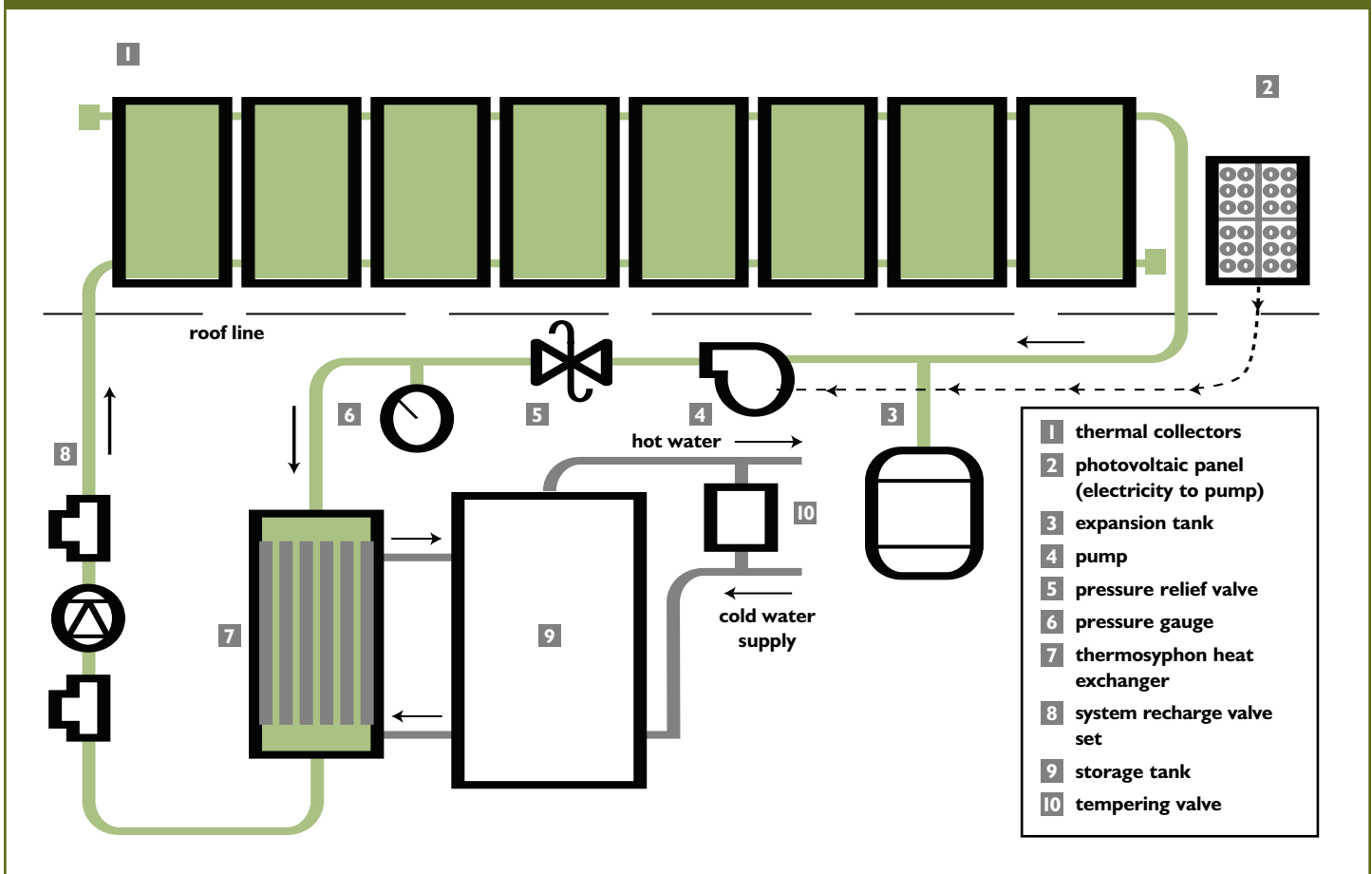


DIAGRAM COURTESY OF BOB RAMLOW, ARTHA SUSTAINABLE LIVING

Solar hot water systems are generally designed to supply about 50 percent of a site's hot water needs. Backup heating equipment (in the form of existing hot water systems) will need to be present, but because the solar hot water system helps share the load, the useful life of this backup equipment will be greatly extended.

SITE ASSESSMENTS

One way to determine whether a solar hot water system would benefit your business is to have your site evaluated by a certified site assessor. During the assessment, a renewable energy consultant will analyze your energy needs, offer energy efficiency suggestions and evaluate your site's suitability for a solar hot water system. Following the assessment, you will receive a written report of the consultant's findings, including recommendations for the best place to locate the system and a general cost estimate for the system.

Focus on Energy will pay up to 50 percent of the cost of the site assessment for eligible businesses. To learn more about the benefits of and financial incentives available for site assessments, visit focusonenergy.com/siteassessments.

FINANCIAL INCENTIVES

Focus on Energy offers Cash-Back Rewards and implementation grants for the installation of solar hot water systems. Visit focusonenergy.com/reincentives for current Focus incentives. Your utility may offer incentives as well.

TAX BENEFITS

A number of federal and state tax benefits may be available for those who invest in solar hot water systems. Please contact your tax consultant to see how the following benefits can affect your particular business.



PHOTO: COURTESY OF AREA MECHANICAL, INC.

This 24-panel installation serves Baldwin Care Center, a nursing facility in Baldwin, WI. Installed by Area Mechanical, with assistance from Hot Water Products, this system will supply about 30 percent of the center's hot water needs.



PHOTOS: COURTESY OF ENERGY CONCEPTS, INC.

A maker of socks since 1904, Sheboygan-based Wigwam Mills now hosts a 27-panel system installed by Energy Concepts, with assistance from Hot Water Products, that preheats the water used in its color-dyeing process.

Solar Energy Business Tax Credit (Federal)

The federal government offers solar energy tax credits to commercial businesses that invest in or purchase solar energy property in the U.S. At the time of this publication, the 30 percent tax credit reduces to 10 percent on January 1, 2009. Please see the "For More Information" section at the end of this fact sheet to learn where you can find up-to-date information on tax credits.

Depreciation (Federal)

The federal Modified Accelerated Cost-Recovery System (MACRS) allows qualifying solar property to be depreciated on a five-year class life. The Economics Stimulus Act of 2008 also offers a 50 percent bonus depreciation provision for qualified equipment purchased and placed in service in 2008.

Solar Energy Equipment Property Tax Exemption (Wisconsin)

This statute exempts taxpayers from any value added by a qualified renewable energy source for property tax purposes.

FOR MORE INFORMATION

Focus on Energy

Learn more about solar hot water systems and how this technology can be a smart investment for your business. You can also learn about other renewable energy technologies and the financial incentives available for installing them.

focusonenergy.com/renewable/solar-hotwater

Solar Energy Industries Association

Up-to-date information on tax credits.

seia.org



Database of State Incentives for Renewables & Efficiency

A comprehensive source of information on state, local, utility and federal incentives that promote renewable energy and energy efficiency.

dsireusa.org

Internal Revenue Service

For more information on federal equipment depreciation, see the Internal Revenue Service (IRS) Publication 946, IRS Form 4562: Depreciation and Amortization, and Instructions for Form 4562.

irs.gov

Solar Rating and Certification Corporation

For information about certification, rating, and labeling for solar collectors and for complete solar water heating systems.

solar-rating.org

Focus on Energy works with eligible Wisconsin residents and businesses to install cost effective energy efficiency and renewable energy projects. Focus information, resources and financial incentives help to implement projects that otherwise would not be completed, or to complete projects sooner than scheduled. Its efforts help Wisconsin residents and businesses manage rising energy costs, promote in-state economic development, protect our environment and control the state's growing demand for electricity and natural gas. For more information, call **800.762.7077** or visit focusonenergy.com.

