



BIOMASS



SOLAR



WIND

For more information,
call **800.762.7077** or
visit focusonenergy.com.



PHOTO: KALAHARI RESORT & CONVENTION CENTER

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.

WHY ENERGY EFFICIENCY?

It is important to maximize the energy efficiency of your home or business before you purchase any renewable energy system. The smaller your energy needs, the lower your monthly energy bills—and the less you'll need to spend on a renewable energy system that's capable of meeting your needs.

And now, home and business owners who invest in energy-efficiency upgrades prior to installing a solar electric, solar hot-water, or wind energy system may be eligible to receive enhanced financial incentives ranging from 10 to 25 percent higher than the standard Focus incentives. Call 800.762.7077 to learn more.

THE ECONOMIC BENEFITS OF SOLAR HEATING

Solar hot-water systems can be a smart investment that provide sustained energy cost savings well beyond up-front cost recovery. Depending on the application, the internal rate of return 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 offset the environmental costs of other heating fuels. Every square foot of a solar collector reduces net carbon dioxide by more than 23 pounds 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.

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 plumbed to a 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. The fluid is then pumped back to the collector and the process begins again. See the diagram on page 3 for an illustration.

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 40 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 need to 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 similar government facilities
- Agriculture
- Food processing and similar industries
- Water parks and campgrounds
- Car washes
- Laundries and laundromats

SYSTEM SIZING

To optimize the return on your investment, 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.

Solar hot-water systems are generally designed to supply about 30-50 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.

A PRESSURIZED HOT-WATER SYSTEM FOR A SMALL OR MEDIUM BUSINESS APPLICATION

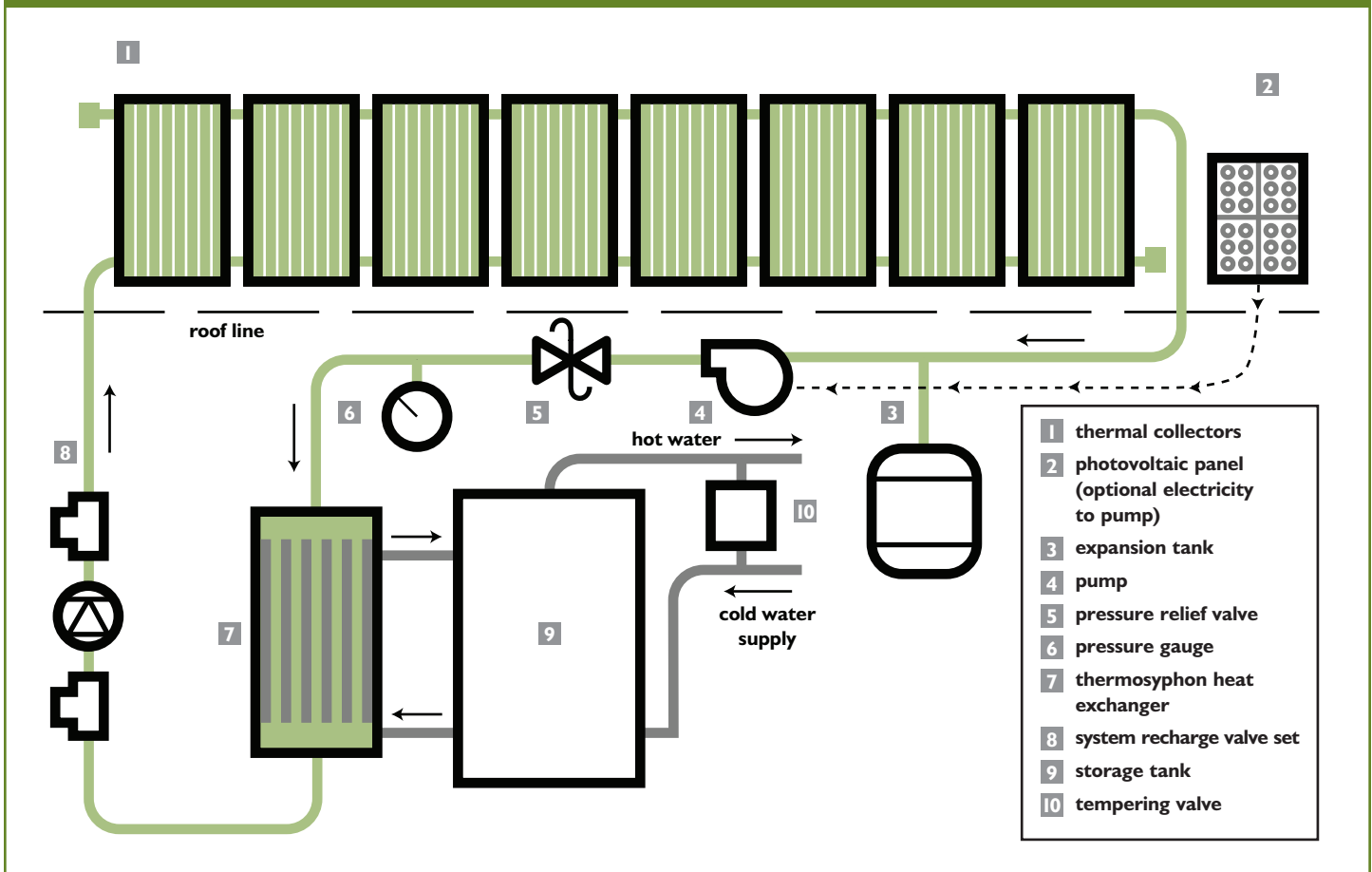


DIAGRAM COURTESY OF BOB RAMLOW, ARTHA SUSTAINABLE LIVING

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.

To learn more about the benefits of and financial incentives available for site assessments, visit focusonenergy.com/siteassessments.

FINANCIAL INCENTIVES

Focus on Energy offers financial incentives for the installation of solar hot-water systems. Visit focusonenergy.com/reincentives for current Focus incentives. Your utility may offer incentives as well.

For a comprehensive list of state, local, utility, and federal incentives that promote renewable energy and energy efficiency, visit dsireusa.org.



PHOTO: COURTESY OF AREA MECHANICAL, INC.

This 24-panel installation serves Baldwin Care Center, a nursing facility in Baldwin, WI. 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 that preheats the water used in its color-dyeing process.

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.

- A Business Energy Investment Tax Credit (ITC) may pay for 30 percent of eligible expenditures for solar hot-water systems.
- The federal Modified Accelerated Cost-Recovery System (MACRS) allows qualifying solar property to be depreciated on a five-year class life. For more information about federal tax credits and federal equipment depreciation, visit irs.gov.
- The Wisconsin Solar Energy Equipment Property Tax Exemption exempts taxpayers from any value added by a qualified renewable energy source for property tax purposes.
- For up-to-date information on tax credits, visit seia.org.

FOR MORE INFORMATION

To learn more about solar hot-water systems and how this technology can be a smart investment for your business, visit focusonenergy.com/renewable or call Focus on Energy at 800.762.7077.



Central Waters Brewing Company in Amherst, Wisconsin installed a 24-panel solar hot-water system in March 2009.

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.

