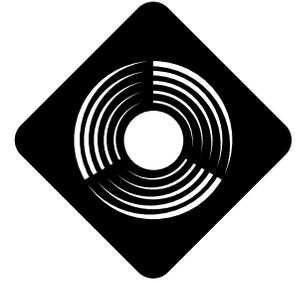


Solar Electricity Works for Texas



RENEWABLE ENERGY
THE INFINITE POWER
OF TEXAS

SECO FACT SHEET **NO. 12**

HIGHLIGHTS

- ◆ **Photovoltaics offer a cost effective, reliable and flexible alternative in “off grid” and small power applications**
- ◆ **Photovoltaic systems have no moving parts, consume no fuel, and create no pollution**
- ◆ **Photovoltaic systems are becoming cheaper and more common**

SUMMARY

From pocket calculators to sophisticated telecommunications equipment, photovoltaic (PV) systems are a viable and cost-effective power source for many uses. First developed for use in the U.S. space program, PV power now costs only a fraction of what it once did. Declining costs coupled with improved reliability and availability have led to widespread usage of the technology. PV now powers over 1.5 million homes around the globe, and the PV industry is growing 20 times faster than the oil industry.



SOURCE: GLENN S. BAIR

School crossing signal powered reliably by PV

Photovoltaics are a perfect solution for situations calling for small amounts of power and high reliability.

Here in Texas, PV is being used for everything from powering school crosswalk warning signs to powering homes and water pumping systems.

THE UBIQUITOUS PV

Calculators, refrigerators, gate openers, railroad switches, weather sta-

tions and navigational buoys are just a few of the items now being powered by photovoltaic cells. The economics of PV power, which cost about \$4 to \$5 per Watt for modules alone and \$10 to \$15 per Watt for complete systems, are most cost-effective for applications that are a



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SOURCE: CENTRAL & SOUTH WEST SERVICES

Using the sun to water livestock

This PV system powers a small pump jack sitting atop the water storage tank. During sunny weather, when cattle are most thirsty, PV watering systems perform at their peak.

mile or more away from existing power lines or that require small amounts of energy. PV's growing popularity stems from its unparalleled flexibility. For power needs ranging from milliwatts to kilowatts, PV can handle the job anywhere on earth or beyond. Thanks to its declining cost and high reliability, PV usage is gaining acceptance for new applications every day.

COMMON PV APPLICATIONS

TELECOMMUNICATIONS

PV has become a common power source for a broad spectrum of telecommunications equipment including wireless phone repeater towers, radio-controlled valves used on oil and gas pipelines, emergency telephones, weather stations and remote data-logging equipment.

CONSUMER PRODUCTS

We are all familiar with solar-powered electronic calculators. Their batteries are recharged by small PV cells, allowing them to run indefinitely without any maintenance. That advantage has led to the use of PV cells in a myriad of small electronic devices including outdoor patio lights and toys. PV-powered chargers are also available to recharge batteries used in small electronics as well as in recreational vehicles, golf carts and boats.

EMERGENCY POWER

The portability and self-contained nature of PV has made it an increasingly popular source of emergency power during disaster relief. After a storm when electric power is unavailable due to downed power lines, PV

modules can provide the power needed for search and rescue operations and other critical activities.

SPACE APPLICATIONS

Photovoltaics continue to be the preferred power source in space. PV cells power orbiting telecommunications satellites, the international space station, and Mars exploration probes. NASA's Texas laboratories have recently developed a battery-free direct-drive refrigeration technology for the international space station that is now being commercialized for terrestrial use.

BUILDING INTEGRATED SYSTEMS

When is an awning more than an awning? When it also doubles as a PV module. Solar shingles, skylights coated with PV material and other new building products can generate electricity while also serving as an important structural or design element of a home or office. Architects and building designers are gradually incorporating these new products into their latest designs.

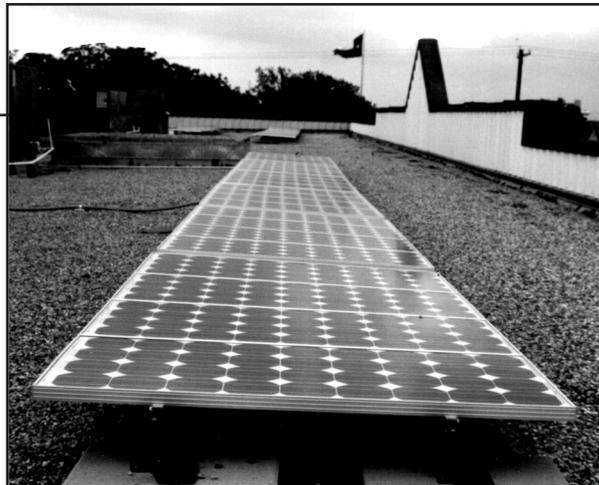
WATER PUMPS

Powering water pumps up to about 2 horsepower in size is one of the most competitive areas for PV since it is

simple, reliable and requires little maintenance. A well-designed and maintained PV water pumping system can last 20 years or more. PV pumping systems start at about \$1,500.

SOLAR LIGHTING

Thousands of school zone flashing lights powered by PV are in use across Texas, saving taxpayers time and money by avoiding expensive construction needed to install underground power lines. In addition, PV power is used for road maintenance warning signs, security lights, bus stops, and billboard lighting. Typical solar lighting systems cost from \$600 to \$1,500.



SOURCE: JUDY PEARSON

Ebenezer Baptist Church Day Care Center Houses PV Panels Thanks to Austin Energy and volunteers from the Texas Solar Energy Society, the Day Care Center in East Austin is home to a large 6kW array of PV panels that will reduce their utility bill by about \$900 annually.

GATE OPENERS

Gate openers are an ideal candidate for PV power because they are often located far from available power lines. Some models are brawny enough to open gates 16 feet wide and weighing up to 250 pounds. These gate openers cost about \$700 and can utilize wireless remote control mechanisms

or digital keypads, both of which offer convenience and security.

A ROOF FULL OF CELLS

While there are a myriad of low-power applications suitable for PV use, the biggest market for PV power may lie on residential rooftops. As always, the first step would be to make your home as energy efficient as possible. Your remaining electrical needs would then require a PV system with a capacity of about two kilowatts. With a price tag of \$5,000 to \$20,000, a complete residential PV system offers a green alternative that may appeal to some grid-connected consumers. Perhaps more importantly, the PV option allows homeowners greater flexibility in choosing a home site, since self-sufficient PV homes would not need to be located near existing power lines.



SOURCE: UT HEALTH SCIENCE CENTER

Building integrated PV panels The University of Texas Health Science Center in Houston incorporates a wall mounted awning to provide shade for windows below it as well as 7kW of AC modules.

ORGANIZATIONS

American Solar Energy Society

2400 Central Ave., G-1
Boulder, CO 80301
(303) 443-3130
www.ases.org

CADDET

Center for Renewable Energy

1617 Cole Blvd
Golden, CO 80401-3393
(303) 275-4373
www.caddet-re.org

National Renewable Energy Laboratory

1617 Cole Blvd.
Golden, CO 80401-3393
(303) 275-3000
www.nrel.gov

Texas Solar Energy Society

P. O. Box 1447
Austin, TX 78767-1447
(512) 326-3391
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www.txses.org

Texas Renewable Energy Industries Association

P. O. Box 16469
Austin, TX 78761
(512) 345-5446
www.treia.org

RESOURCES

FREE TEXAS RENEWABLE ENERGY INFORMATION

For more information on how you can put Texas' abundant renewable energy resources to use in your home or business, visit our website at www.InfinitePower.org or call us at 1-800-531-5441 ext 31796. Ask about our free lesson plans and videos available to teachers and home schoolers.

ON THE WORLD WIDE WEB:

Center for Renewable Energy and Sustainable Technology (CREST)

A comprehensive educational resource for renewables. A good place to start your search.
solstice.crest.org

Department of Energy. Web pages run by the Department of Energy on everything from cooling your home naturally to selecting a new water heater.

www.eren.doe.gov/consumerinfo

Florida Solar Energy Center. Information on photovoltaics, batteries, alternative buildings systems, solar heaters. The center is developing a test house which relies exclusively on PV power. www.fsec.ucf.edu

El Paso Solar Energy Association. Lots of good information. www.epsea.org



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