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## ENN FULL STORY

### Solar power: the great untapped energy source

June 07, 2000 — By Pat Murphy Environmental News Network

Statistics about Earth's greatest source of energy ♦ solar power ♦ are as astonishing as the fact that virtually all of it goes to waste.

Consider:

- Each day, more solar energy bathes Earth than its 5.9 billion inhabitants consume in equivalent electric power in 27 years, according to the U.S. Department of Energy's National Renewable Energy Laboratory in Golden, Colo.
- A patch of 100 square miles of open space covered with efficient solar panels such as in Nevada, where sun rays are powerful, could generate all the electrical power needs of the United States, according to NREL calculations.
- In the continental United States, Hawaii and Alaska, the average daily equivalent of electrical power from the sun is an almost incalculable 385 quadrillion megawatts. The heaviest concentration is along the Sun Belt in Southern California, Nevada, Arizona and New Mexico, although ample sun power falls throughout the nation. Just five megawatts meets the electrical needs of 500 energy-efficient homes for a full year.



Courtesy NSSDC / NASA

**Nearly all communications satellites, including the Hubble Space Telescope pictured here, are powered by photovoltaic technology.**

- All space flights as well as the huge international space station being built in Earth's orbit rely entirely on solar power for sophisticated electronic systems as well as the production of water and oxygen.

And yet, this amazing, endless shower of sun power has been all but untapped as a major source of electrical energy, which even ranks behind wind power, the fastest growing form of [renewable](#) energy.

Until now.

Solar energy may finally be moving out of the shadows and into the spotlight. A survey of institutions and organizations specializing in solar energy development indicates new momentum and public interest in solar energy.

Items:

- Arizona recently became the first state to require its regulated utilities to produce a specific percentage of total electricity from renewable sources ♦ 1.1 percent, half of which must be solar. Arizona is the first

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state to require a specific amount of solar production by law, over the objections of Arizona utilities that claim generating power from solar is too costly.

- Energy Secretary Bill Richardson gave a boost to solar energy on Earth Day with \$630,000 in grants to 13 states to accelerate the Million Solar Roofs Initiative. Adopted three years ago by President Clinton, the program aims to facilitate the installation of one million solar energy systems on roofs throughout the nation with the assistance of federal grants. The government also is targeting federal buildings for solar energy installations to accelerate development while it markets new systems ♦ and thus lower costs ♦ through mass production.



By Warren Gretz / courtesy NREL

### The Sacramento Municipal Utility District shut down nuclear reactors in favor of solar energy technology.

- The Sacramento (California) Municipal Utility District's PV Pioneer program (PV refers to photovoltaic cells that convert sunlight into electricity) provides 2,000-watt rooftop solar energy systems to customers at discount rates (\$4,740 vs. \$10,140 full price). Excess electricity generated by the rooftop systems is returned to the main power grid, and homeowners receive credit. Rooftop systems supply about half an average home's power needs.
- In Colorado, a spurt of purchases of rooftop solar systems by homeowners followed severe power outages, according to Rick Gilliam, senior technical adviser to the Land and Water Fund of the Rockies.
- Another indicator of increased public interest, says Maureen McIntyre, editor of Solar Today magazine, is the increasing number of inquiries she receives from mainstream media reporters seeking information about solar energy.
- Solar is now being used widely around the world, even in remote areas, for pumping water, drying crops and lighting.
- Dramatic leaps in the application of solar technology are being made in architectural and engineering work of Solar Design Associates in Harvard, Massachusetts. The company uses large, custom-made photovoltaic panels as walls, atriums and skylights to generate power in new buildings.

Steven Strong, president of Solar Design, says the technique has been in used in Europe and Japan and is finally attracting U.S. interest. Germans perfected the design of a huge shoebox-like generating container made of [photovoltaics](#). Inside the container are nine buildings receiving solar power. The Japanese built a high-rise with a photovoltaic outer skin.





By Bevan Walker / courtesy Solar Design Associates

**Solar Design worked with architects in Green Bay, Wisconsin, to design a multi-use facility on the University of Wisconsin campus using solar-generated electricity.**

Solar Design's first project of this kind is a new building at the University of Wisconsin in Madison, where a 3,000-square foot atrium will house a large photovoltaic system to generate power.

Strong's company also has contracts with Montana State University and Oberlin College that include energy-producing photovoltaic cells rather than conventional building materials for flat surfaces.

Endless applications of this engineering are on the horizon, Strong says. They include solar panels on open space at major airports to power airfield systems; median strips converted to solar generators along freeways; panels on railroad-rights-of-way. Any flat surface that can collect sunlight will do.



By Bevan Walker / courtesy Solar Design Associates

**In another project, Solar Design incorporated photovoltaics to the south-facing surface of the "Solar Cube" at Discovery Science Center in Santa Ana, California.**

Driving Strong's innovations is a belief that fossil fuels are a finite energy source. Citing studies by Colin Campbell, a geologist and author of "The Coming Oil Crisis," Strong believes that during the 21st century increased energy demands by an increasing world population will force the transition to solar power. He sees solar energy as the only potential replacement for fossil fuels on a large scale.

If all the world's known oil reserves were allocated per capita, Strong says each person on Earth would have the equivalent of 4.1 barrels of oil for all their needs. But that, he says, will be cut in half in 20 years as a greater world population places larger demands on oil production.

Strong and others also cite one of the most far-reaching environmental benefits of solar power: If used widely, power from the sun will reduce, and ultimately eliminate, noxious toxic residue from fossil-fuel industrial generators and motor vehicles.

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