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## Million Solar Roofs Update: Federal Leadership Is Essential to Success

By Peter Dreyfuss, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy

Ever since President Clinton announced the Million Solar Roofs Initiative on June 26, 1997, Federal agencies have been playing a key role in implementing it.

The Federal sector is actively participating in this initiative in two major ways. First, Federal agencies are examining their programs and resources to identify ways to support the installation of a million more solar energy systems on U.S. buildings. Second, they are identifying specific solar energy projects for their facilities.

This is being done to support the commitment the President made that the Federal sector would make a "down payment" on the initiative by installing 20,000 solar systems on its own buildings by the year 2010. At the announcement's one-year anniversary, through the leadership of the Department of Energy's (DOE's) Federal Energy Management Program (FEMP) and the active participation of numerous Federal agencies, we are well on our way to installing 2,000 systems by the end of the year 2000 and 20,000 systems by 2010.

In many ways, solar energy is a natural addition to the portfolio of resources for Federal buildings. Recently, I had an opportunity to tour solar installations in Hawaii, where the Navy is installing solar hot water systems on hundreds of new housing units. This is being done primarily because it makes good economic sense: it saves money.



Peter Dreyfuss

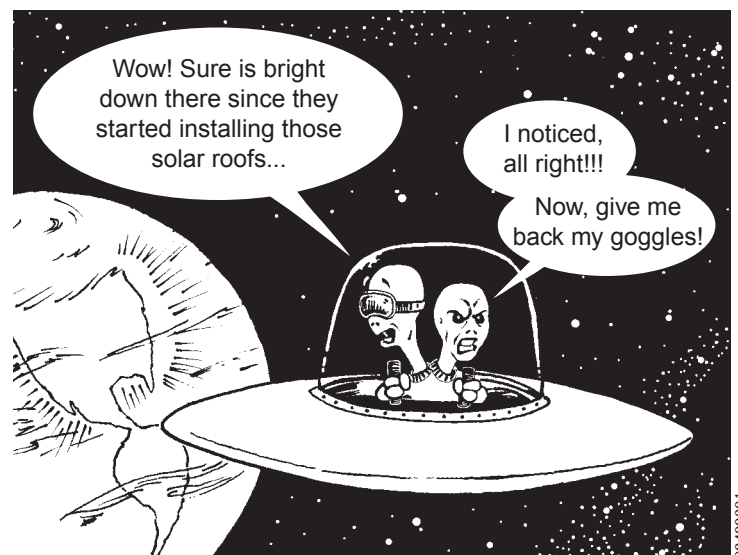
But it is also helping the nation reduce its dependence on fossil fuels and thus reduce harmful emissions of the greenhouse gases that contribute to global warming. Even as other Federal agencies undertake projects like the Navy's, we realize that still more are needed.

In our first year, one recurring question has been, "How are we going to pay for these systems?" I recently attended a meeting on financing solar energy that included

*(Continued on p. 3)*



U.S. Department of Energy  
Federal Energy Management Program



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## Collecting Our Thoughts

By Patrina Eiffert Taylor, Editor

How many of us know people who are unhappy in their jobs? We invest so much time and energy in our work that it is very important to make it a rewarding experience. And it's often the intangibles that make all the difference. These include stimulating challenges, a sense of personal satisfaction, and recognition for a job well done.

DOE, FEMP, and NREL recently had an excellent opportunity in Hawaii to recognize several solar energy champions for jobs well done in supporting the Million Solar Roofs Initiative. These folks are implementing solar projects that will save some of the money previously spent on facility operation and maintenance costs (thus saving taxpayer dollars) and save the environment from the harmful greenhouse gas emissions associated with burning fossil fuels.

My mother always said that it's better to give than to receive. DOE's Peter Dreyfuss and I found that to be true in Hawaii in May when it was our pleasure to recognize fifteen people for jobs very well done. A list of these people and their projects follows.



Sara Medeiros, HECO/PX06240

*Among those attending the May 28 award ceremony in Hawaii were (left to right) Navy Capt John M. Shrewsbury, accepting for Cmdr Gretchen Helweg; Peter Dreyfuss, DOE; Patrina Eiffert Taylor, NREL FEMP; Guy Matsuda, engineer; and Navy Lt Daniel McNair, accepting for John Campos.*

Cmdr Bruce Black, Cmdr Larry Jaeger, Ronald Iwao, Bonnie Hoe, and Kevin Kanekoa; U.S. Coast Guard Kia'i Kai Hale Solar Retrofit Project.

Cmdr Gretchen A. Helweg, John Campos, and Guy Matsuda; U.S. Navy Moanalua Terrace Phase II Family Housing Project.

Richard O'Connell, Jay Mulki, Norris Creveston, Keith Block, Ron Richmond, Michael Chang, and Sam Gilley, Hawaiian Electric Co.; Domestic Solar Hot Water Systems for Base Housing Projects. ■

## Pentagon Showcases Solar Power

By Karen Thomas, National Renewable Energy Laboratory

The Pentagon Federal Energy Saver Showcase is living up to its label as an "Energy Efficient/Environmentally Sensitive DoD Showcase Facility." Not only does this showcase project include improvements in energy efficiency and water conservation, it also demonstrates an impressive new hybrid Solar Dish/Stirling Power System.

On June 8, this solar electric power system provided the backdrop for an inaugural event held on the grounds of the Pentagon. Dan Reicher, DOE Assistant Secretary, Energy Efficiency and Renewable Energy, moderated. Also present were Shelley Fidler, Chief of Staff, White House Council on Environmental Quality, and John Goodman, Deputy Secretary for Industrial Affairs and Installations. Project partners who attended included Barry Butler of Science Applications International Corporation, which manufactured the Dish/Stirling Power System; Lennart Johansson of STM Corporation, which developed the system's

power conversion unit; and Larry DeSimone of Virginia Power Company, which helped to make the demonstration possible. Scott Sklar of the Solar Energy Industries Association was also there.

Dish/Stirling systems convert the thermal energy in solar radiation to mechanical energy and finally to electrical energy. The system's array of mirrors concentrates the sun's energy onto a receiver that heats up a working gas, such as hydrogen, in the power conversion unit; the temperature fluctuations of the gas drive a Stirling engine that generates electricity. Similarly, conventional power plants generate electricity by making use of the thermal energy resulting from combustion of a fossil fuel.

The power systems are modular and can be used in remote applications, grouped together in small-grid (village power) systems, or used for end-of-the-line utility applications. The thermal efficiency of the Stirling engine is 42%, and the sunlight-to-

*(Continued on p. 6)*



Mark Lensch, SEIA/PX06235

*Among those on the dais at the Pentagon Dish/Stirling Power System (background) ceremony in June were (left to right) Scott Sklar, SEIA; Lennart Johansson, STM Corp.; Barry Butler, SAIC; Dan Reicher, Assistant Secretary for Energy Efficiency and Renewable Energy, DOE; and Shelley Fidler, White House Council on Environmental Quality.*



Vicki Moore

## GSA Speeds Up Solar Procurements

By Vicki Moore, GSA

Have you considered purchasing the solar products you need from the General Services Administration's (GSA's) Federal Supply Schedule?

Using the new Solar Schedule can significantly reduce your procurement lead time and simplify your purchases of renewable energy equipment. And purchasing from GSA schedules is now easier and more convenient than ever before.

Recently, certain Federal Acquisition Regulations (FAR) were revised that provide guidance to those using GSA's Multiple Award Federal Supply Schedules. Perhaps the most beneficial changes for Federal contracting officers are the new, streamlined ordering procedures described in FAR 8.404(b)(1&2). Here are some of the highlights of the changes in these procedures:

- For orders under \$2,500: Ordering offices can place orders with *any* Federal Supply Schedule contractor, and the documentation needed is minimal; often, just the name of the contractor, the item, and the amount are required.
- For orders over \$2,500: Offices can place orders with the schedule contractor that provides the product representing *the best value, not the lowest price*. Since the FAR does not specify what constitutes "best value," contracting officers are not limited in deciding on the factors that go into a best-value determination. However, the FAR does specify that ordering offices review the GSA price lists of three

schedule contractors, or use "GSA Advantage!<sup>TM</sup>" to compare prices. Then contracting officers can simply document their best-value determination.

No further competition is needed, no detailed specifications for vendors to second guess, no synopsis of the requirement, and no separate determination of fair and reasonable pricing! The GSA has taken care of all of these requirements in the schedule. The FAR states that, "by placing an order against a schedule using the procedures in this section, the ordering office has concluded that the order represents the best value and results in the lowest overall cost alternative (considering price, special features, administrative costs, etc.) to meet the Government's needs."

GSA schedules contain many provisions that assist you in purchasing solar equipment. For example, new maximum order guidelines allow ordering agencies to place orders of any size with a schedule contractor (FAR 8.404(b)(3)). Blanket purchase agreements (BPAs) allow you to set up accounts with schedule vendors. Under the BPA provisions, a best-value determination is not required for each order; rather, the BPA is simply reviewed annually (FAR 8.404 (b)(4)).

Ordering agencies can also ask for price reductions from schedule contractors, a practice prohibited in the past (FAR 8.404(b)(5)). And schedule contractors can team up to meet an agency's needs (see FAR 9.6 for guidance).

Services such as design assistance and installation supervision can also be ordered under the GSA Federal Solar Schedule. For more information, contact Vicki Moore, contracting officer, 817-978-8632, or e-mail [vicki.moore@gsa.gov](mailto:vicki.moore@gsa.gov). The Solar Schedule is available on the Internet at <http://www.gsa.gov/regions/7fss/7fx/schedules> (click on Schedule 62, Part II). ■

## A New Lease on Life for Solar Orphans

By Joseph Osborne, National Renewable Energy Laboratory

Before you dismantle that old solar system, there's something you should know. Today's technical advances, experienced contractors, and alternative financing opportunities can make solar rehabilitation a viable alternative to removal. Some of the best candidates for rehabilitation are large, nonoperational systems needing repairs or upgrades that could be financed through alternative financing options such as Energy Service Performance Contracts (ESPCs). For more information, contact Joseph Osborne, NREL; phone: 303-384-7522; fax: 303-384-7411; e-mail: [joseph\\_osborne@nrel.gov](mailto:joseph_osborne@nrel.gov) ■

## Million Solar Roofs Update


(Continued from p. 1)

public- and private-sector financing experts. At one point, a private-sector financial advisor questioned the government's role in financing. I pointed out that there are numerous examples of excellent public financing activities in our nation. And there are even more examples of successful public/private financing partnerships.

One outstanding example is Super Energy Savings Performance Contracting (ESPC), which is coordinated by FEMP. By harnessing the collective needs of the public sector with the financial resources of the private sector, we are successfully implementing energy efficiency and solar energy projects throughout the Federal sector. Federal agencies need to take advantage of the billions of dollars that are now available through Super ESPCs.

Soon we will announce other financing options that will assist individuals and businesses investing in solar energy. We will also have more tools available for the Federal sector. This assistance will be available throughout the nation; it will be promoted through state and local partnerships working to ensure that solar energy plays a greater part in our nation's energy supply.

Federal agencies have many challenges; providing leadership for a solar-powered future is an important one. By demonstrating cost-effective installations and partnering with the private sector, Federal agencies show the rest of the nation that solar energy is here today, and that it is an excellent investment in our nation and our future. ■



*There are risks and costs to a program of action. But they are far less than the long-range risks and costs of comfortable inaction.*

John F. Kennedy

# The FEMP Renewable Energy Working Group: An Update

By Nancy Carlisle, National Renewable Energy Laboratory

Working together, members of FEMP's Renewable Energy Working Group (RWG) identify opportunities to deploy renewable energy, stimulate the market, and increase the use of renewable energy technologies and products in the Federal sector. About 150 people from DOE, other Federal agencies, and the renewable energy industry meet several times a year, and correspond even more frequently over electronic networks, to achieve their Federally mandated goals.

Established in 1994 by the Interagency Energy Management Task Force, the RWG's first priority was to develop a renewable energy implementation plan, which is required by Executive Order 12902. The plan recommended that participating Federal agencies take the following three actions:

- Develop an agency renewable energy implementation plan
- Train staff to recognize opportunities for renewable energy technologies and ways to deploy them
- Implement one showcase project featuring a renewable energy technology.

The RWG has also developed a model plan for agencies to use in developing their own. Several agencies have completed plans; others have incorporated renewable energy into an overall energy plan; and still others are just getting started. In some cases, considerable activity is occurring in the field; these field activities often provide a good starting place for an overall agency strategy.

At least 10 Federal agencies have agreed to develop plans, including the Department of Agriculture, Department of Defense, Department of Energy, General Services Administration, Department of Health and Human Services, Department of Interior, National Aeronautics and Space Administration, Department of State, Department of the Treasury, and Department of Veterans Affairs. In addition, the Environmental Protection Agency, Department of Commerce, Department of Labor, and Department of Transportation have endorsed the process, and their renewable energy activities are in progress. Federal agencies were also asked to develop plans in support of the Million Solar Roofs Initiative. The RWG is working

with agencies to develop their Million Roofs plans and include them in the renewable energy plans.

The RWG provides a forum for sharing lessons learned in implementing Federal projects. It also serves as an information network for DOE FEMP, a feed-back mechanism to DOE on renewable energy initiatives, and a means of interacting with industry. The RWG has built a strong network of "champions" for renewables from DOE, other agencies, and industry.

An RWG subcommittee has prepared a report on the barriers to the greater use of renewables in the Federal government, and it has developed a broad range of suggestions to help agencies use more solar and renewable energy in Federal facilities. One suggestion, being reviewed by DOE, includes a set of legislative changes to the National Energy Policy Act and a draft government guidance document to encourage wider use of renewable energy.

The RWG has met four times in 1998 to discuss such topics as barriers to implementation and a workshop for industry on renewable systems on the GSA Supply Schedule (see article on p. 3). Meetings are also being planned to take place this Fall and Winter in New York City and Washington, D.C.

For more information, contact Nancy Carlisle, NREL, (303) 384-7509, or via e-mail: Nancy\_Carlisle@nrel.gov. ■



Nancy Carlisle, chair of the Renewable Energy Working Group

Warren Greta, NREL/PIX06236

## ■ Spotlight on Technology:

# A Brighter Future for Solar Thermal Systems

By Joseph Osborne, National Renewable Energy Laboratory

There was a time when, if you had a crystal ball, you might have thought the future of solar thermal technologies looked a little cloudy. Today, thanks to the ingenuity and hard work of the solar energy community, things are looking up for solar thermal systems.

U.S. manufacturers and proponents of environmentally friendly solar thermal systems began to encounter some barriers to more widespread use in the 1980s. These barriers can be grouped into three main categories: financial, technical, and institutional. The challenge for the solar research and development (R&D) community, manufacturers, and Federal energy managers was to find ways to overcome these barriers, and that's exactly what has happened.

**Financial changes.** Solar thermal technologies have had a tough time competing with conventional sources of heat and electric power in areas where the price of fossil-generated electricity and natural gas have remained low. In the past, high initial capital costs were sometimes a stumbling block for Federal facility managers who have to ensure that their facility's energy is cost effective.

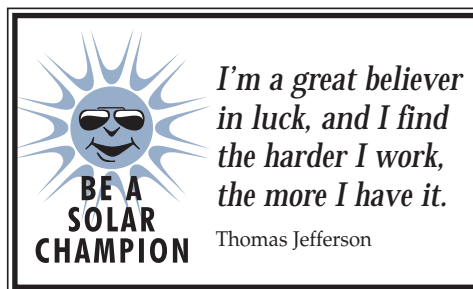
Today, solar thermal systems can be installed at a lower first cost than ever before, and paybacks are typically just 10 years or less. Systems that used to cost about \$80-\$120 per sq.ft. of collector area a few years ago now cost about \$50-\$80 per sq.ft. of collector area. And new financing options make it easier to install solar thermal technology in government facilities.

One of the most interesting financing options for government agencies is Energy Savings Performance Contracting (ESPC). This allows an energy service company (ESCO) to make the initial capital investment in a facility's solar system and be responsible for its operation and maintenance. This virtually guarantees



Joseph Osborne

Terri Spimuzzi, NREL/PIX06239



the agency a cost-effective system at no risk. The ESCO is paid back out of the agency's utility cost savings. ESCOs can thus realize a profit on investments while agencies benefit in several ways, such as compliance with national energy efficiency goals.

**Technical changes.** When energy costs fell in the 1980s, tax incentives for solar systems also began to disappear. This didn't help to level the playing field for new energy technologies. As some of the solar companies failed, the systems they left behind began gaining a reputation for being unreliable. But many technical advances have been made since then by the solar R&D community and manufacturers. The materials used in today's solar thermal systems are more durable, the control technology is more reliable, and more attention is paid to proper installation. Twenty years of lessons learned about the technology are making system operation and maintenance easier.

Certification has been one of the best things to happen to this technology. Programs such as that of the nonprofit Solar Rating & Certification Corporation (SRCC) help purchasers select a system with confidence, after comparing its certified performance and specifications with those of other energy options. To expedite Federal procurements, solar thermal hardware can now be purchased from the GSA Supply Schedule (see article on p. 3).

Organizations like the Florida Solar Energy Center (FSEC) have also done a lot to help improve the situation for the industry. FSEC, a state-supported solar research facility, is a well-known information resource on solar and other renewable energy systems. The center provides free publications, including a quarterly newsletter, to people in both the public and the private sector.

**Institutional changes.** For a while, difficulties encountered in the solar industry resulted in less confidence in solar companies and fewer champions of the technologies. But because of significant improvements in cost effectiveness, system performance and reliability, and system aesthetics, people's confidence in solar thermal systems is increasing again. Purchasers can now make informed decisions about the technology and consequently reduce their consumption of fossil-based energy, which helps to preserve not just our natural resources but also our home here on Earth. ■

*Technology information supplied by Russ Hewett, NREL.*

## SMUD and Government Agencies Can Be Partners in Solar Projects

By Sherri Eklof, Sacramento Municipal Utility District

What kind of opportunities can a municipal electric utility offer in partnerships with government agencies? The Sacramento Municipal Utility District (SMUD) is answering that question for Federal, state, and local government groups wanting to partner with the utility on solar electricity projects. In the area of photovoltaics (PV), considerable opportunities are emerging in which SMUD can offer its partners the benefit of considerable experience as a successful integrator of PV power.

SMUD, the nation's fifth largest public power utility, has installed the world's largest utility-owned distributed PV system, with more than 450 PV installations. SMUD has entered into long-term contracts for 10 megawatts over a five-year period. The lower prices associated with bulk ordering of PV modules and inverters has brought SMUD's installed cost down to about \$5 per watt today; an installed cost of \$3 per watt is projected for 2002.

New partnership opportunities are arising in part out of national support for solar electric power, which is evident in the President's Million Solar Roofs Initiative. SMUD has made a commitment to 25,000 rooftop PV systems over 10 years, and hopes to encourage commitments to 200,000 rooftop installations in California alone.

The Federal government's pledge to have 20,000 solar systems on its buildings by 2010 is increasing these partnership opportunities. Proposed changes in government policies should provide an infrastructure that could soon result in widespread rooftop PV systems.

SMUD's participation is based on a commitment, shared by its customers, to provide environmentally responsible energy services. Customers typically have positive attitudes toward solar, so increasing PV installations should be well received in many areas. Customer support and partnership opportunities will also make it easier for agencies to put more PV systems on the rooftops of California's government buildings. Because the industry needs increased demand to continue to reduce the price of PV systems, these new partnerships should benefit the government, the PV industry, utilities, and utility customers alike.

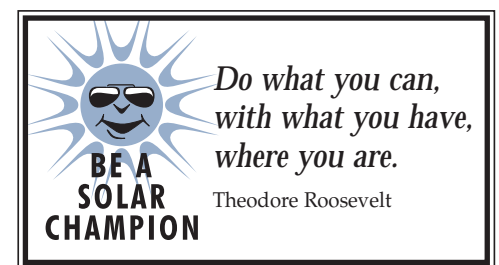


SMUD/PIX06243

*SMUD partnered with Arizona's Citizens Utilities Co. to install this 8-kilowatt PV system at the utility company's warehouse in Kingman, Arizona, in December 1997.*

SMUD has been teaming up with government agencies and other partners since the Board of Directors approved the PV Partnership Resolution in July 1997. A joint effort between SMUD and the Western Area Power Administration (Western) is a prime example. As noted in the first issue of *Save with Solar*, Western has 80 kilowatts of rooftop PV at its Elverta Substation site, and an additional 39 kilowatts is in progress at the Sacramento Operations Center in Folsom. Ownership of these projects is held in part by Western and in part by SMUD.

There are also opportunities for new partnerships outside the Sacramento area. PV systems can be reserved under the Emerging Renewables Buydown Program administered by the California Energy Commission. SMUD and the National Park Service are discussing SMUD's draft proposal to install PV on Alcatraz Island and serve as the island's energy service provider. Other PV partnerships, representing both municipal and investor-owned utilities, include the City of Alameda in California, Main Power in New Zealand, and Citizens Utilities Co. in Arizona. The Citizens Utilities/SMUD partnership received assistance from DOE under the Utility PhotoVoltaic Group's TEAM-UP program. For more information, contact Don Osborn, (916) 732-6679, or Sherri Eklof, (916) 732-6151. ■



## Saving Whales and Energy on Maui

By Renee Azerbegi, National Renewable Energy Laboratory

Thousands of tourists visit the Hawaiian Islands Humpback Whale National Marine Sanctuary on Maui each year hoping to catch a glimpse of these amazing animals during their yearly migration across the Pacific. About two-thirds of the entire North American population of humpbacks gather nearby every year to breed, calve, and nurse their young. The sanctuary is dedicated to protecting this endangered species and its habitat. It supports the work of marine researchers, and its educational displays, kiosks, and videos help visitors understand marine resources and how the environment affects the animals.

The facility was obtained from the U.S. Navy by the National Oceanic and Atmospheric Administration (NOAA) in 1991. Since then, NOAA has remodeled the buildings, made them more energy efficient, and installed renewable energy systems, with help from local volunteers and NOAA's own capital improvements funds.

Herman Chan, a National Weather Service facilities manager, has implemented

measures such as energy-efficient lights, electronic ballasts, and occupancy sensors; these have reduced the facility's energy demand by about 27%. Two thermosiphon-type passive solar water heaters meet the total hot-water demand, and 1.3 kilowatts of photovoltaic (PV) electric power eases demand on the local electric utility.


To secure and demonstrate an even friendlier environment for the whales (and others), the sanctuary would like to be a totally renewable facility. The challenge will be to find partners to make this a reality. Staff hope to purchase another 6.2 kilowatts of PV. To reduce costs, the sanctuary will have an opportunity to sell back surplus electricity to Maui Electric Company at



MECO's rate of about 6 cents per kilowatt-hour and purchase electricity at the end of the day at around 13 cents per kilowatt-hour.

The National Renewable Energy Laboratory (NREL) is seeking ways to fund the second phase of this project. NREL's FEMP team is providing technical assistance, and NOAA has contributed the initial 1.3 kilowatts of PV as well as energy conservation measures. If you would like to be involved, please contact Renee Azerbegi at NREL, (303) 384-7562. ■

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### Pentagon Showcases Solar Power

*(Continued from p. 2)*

electricity conversion efficiency of the power system has been estimated to be from 17% to 29% by technology specialists. This makes it a strong candidate among large solar electric systems. The system cost could be as low as \$1,400 per kilowatt by the year 2010, even though it is about \$12,000 per kilowatt now.

The system at the Pentagon was designed to provide 25 kilowatts of power, enough to provide electricity to a small village without harming the environment. It is being demonstrated to increase people's awareness of a technology that will ultimately be used in cost-effective applications. The system will grace the Heating and Refrigeration Plant on the grounds of the Pentagon for several months before being permanently relocated to Arizona, to supplement Arizona Power's power generation.

Solar dish/Stirling engine technology should be commercially available in approximately two years. In 1999, 40 pre-commercial systems will be deployed to provide a megawatt of power to Public Service Company of New Mexico. Meanwhile, if you have an opportunity to visit Washington, D.C., in the next few months, be sure to look for the sparkling, impressive Dish/Stirling Power System. It's hard to miss at its temporary Pentagon home! ■

## Events

**Energy '98— Breaking the Barriers:** The first annual trade show presented by FEMP will emphasize practical results, information, and case studies on how Federal facilities take resource efficiency projects and programs from conception to completion. Topics include Super ESPCs, performance contracting, operation and maintenance, energy awareness, procurement, and technology.

Location: Bellevue, WA  
Dates: August 3—5, 1998  
Contact: Rick Klimkos, FEMP, (202) 586-8287  
[www.eren.doe.gov/femp/events.html](http://www.eren.doe.gov/femp/events.html)

**Under the Sun—An Outdoor Exhibition of Light:** Located at the Smithsonian Institution's National Design Museum in New York, this exhibition will present innovative solar solutions for local and global energy needs. DOE is one of many sponsors.

Location: New York, NY  
Dates: June 21—October 25, 1998  
Contact: Lucy Fellowes, (212) 860-6338  
[www.eren.doe.gov/pv](http://www.eren.doe.gov/pv)

**PV Design On-Line:** How to design photovoltaic power systems using Internet, textbook, software, and CD-ROM reference materials. Intended for those wanting to work in the solar energy industry as well as those wanting to use solar electricity themselves, the course teaches system sizing, site analysis, hardware specification, component selection, and how to make life-cycle cost comparisons.

Location: On line  
Dates: Open  
Cost: Tuition, \$350; course materials, \$150.  
Contact: (970) 963-8855  
[www.solarenergy.org/classroom](http://www.solarenergy.org/classroom)

**National Center for Photovoltaics PV Program Review Meeting:** The emphasis will be on recent developments in PV and progress in PV program activities at DOE's National Center for Photovoltaics, which includes staff from NREL and Sandia National Laboratories. Participants will discuss and evaluate trends in research and development, advances in manufacturing technology, and PV applications in the public and private sectors.

Location: Denver, CO  
Dates: September 8-11, 1998  
Contact: 1-800-893-3333

**PV Performance and Reliability Workshop:** Reliability and maintenance issues that add to the cost of PV systems will be addressed, and agreement will be sought on strategies that enhance performance through improved hardware, system design, and maintenance methods. Sponsored by the DOE National PV Program.

Location: Cocoa Beach, Florida  
Dates: November 3 and 4, 1998  
Contact: 407-783-9222

## Publications

U.S. Department of Energy, Federal Energy Management Program. 1996. *Federal Technology Alert: Solar Water Heating*. A technology guide that describes solar water heating technologies, their applications, and life-cycle costs in Federal facilities. Washington, DC: US DOE.

U.S. Department of Energy, Federal Energy Management Program. 1998. *Federal Technology Alert: Parabolic-Trough Solar Water Heating*. A technology guide that describes parabolic troughs, their solar heating applications in Federal facilities, and life-cycle costs. Washington, DC: US DOE.

U.S. Department of Energy, Federal Energy Management Program. 1998. *Federal Technology Alert: Transpired Collector (Solar Preheaters for Outdoor Ventilation Air)*. A technology guide that describes transpired solar collectors, which are used to preheat ventilation air; their applications in Federal facilities; and life-cycle costs. Washington, DC: US DOE.

U.S. Department of Energy, Federal Energy Management Program. 1998. *Federal Technology Alert: Photovoltaics*. A technology guide that describes photovoltaic technologies, their application in providing solar electric power for Federal sites and facilities; and life-cycle costs. Washington, DC: US DOE.

U.S. Department of Energy, Federal Energy Management Program. *FEMP Focus*. This bimonthly publication provides Federal personnel with energy management information. For a subscription, fax your address to Judy Hockenbery at (301) 903-5337, or use the FEMP on-line order form: [www.eren.doe.gov/femp/pubs.html](http://www.eren.doe.gov/femp/pubs.html)

**Note:** Federal Technology Alerts are available on-line: [www.eren.doe.gov/femp/fed\\_techalert.html](http://www.eren.doe.gov/femp/fed_techalert.html)

## For More Information

FEMP Help Desk:  
1-800-363-3732

Anne Sprunt Crawley  
Technical Assistance Program Manager  
Federal Energy Management Program  
U.S. Department of Energy  
1000 Independence Ave., S.W.  
Washington, DC 20585  
(202) 586-1505

## Computer Tools

You can download these software tools from the DOE Energy Efficiency and Renewable Energy Network at <http://www.eren.doe.gov/femp/techasst.html>:

FRESA (Federal Renewable Energy Screening Assistant)

BLCC (Building Life-Cycle Cost analysis software)

ASEAM 5.0 (A Simplified Energy Analysis Method)

See also:

PVSIZE (Photovoltaic Sizing Software)\*

RSPEC! (Reduce Swimming Pool Energy Costs)\*

\*You can obtain a comprehensive list of software tools, including these, at [http://www.eren.doe.gov/buildings/tools\\_directory](http://www.eren.doe.gov/buildings/tools_directory), or by calling the FEMP Help Desk at 1-800-363-3732.

## Web Sites

Please see also these World Wide Web and Internet sites ([http:// ...](http://...)):

[www.eren.doe.gov/femp](http://www.eren.doe.gov/femp)

[www.sandia.gov/pv/lib/PV\\_NOW/base.html](http://www.sandia.gov/pv/lib/PV_NOW/base.html)

[www.nrel.gov](http://www.nrel.gov)

[www.MillionSolarRoofs.org](http://www.MillionSolarRoofs.org)

[www.eren.doe.gov/buildings/bldg21c](http://www.eren.doe.gov/buildings/bldg21c)

[www.eren.doe.gov/solarbuildings/index.html](http://www.eren.doe.gov/solarbuildings/index.html)

[solstice.crest.org/renewables/](http://solstice.crest.org/renewables/)



# Save with Solar

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## *Save with Solar: A Quarterly Technical Bulletin for Federal Solar Energy Champions*

Patrina Eiffert Taylor, Editor  
National Renewable Energy Laboratory  
1617 Cole Blvd.  
Golden, CO 80401-3393  
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Andy Walker, NREL/PIX04581

*Solar water heating systems like this are now on the GSA Federal Supply Schedule. Solar thermal water heating systems, like the one on the roof of this small facility in Chickasaw National Recreation Area in Oklahoma, can now be ordered virtually "off the shelf" through the GSA (see p. 3 for more information). Staff of the Department of Energy's Federal Energy Management Program provided a feasibility study, specifications, a design review, and inspection services for this 104-square-foot drainback system; it also has a 500-gallon storage tank.*

**FEMP**  
FEDERAL ENERGY MANAGEMENT PROGRAM