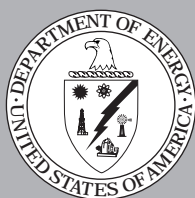


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Collecting Our Thoughts

By Patrina Eiffert Taylor, Editor

There are so many opportunities for solar energy projects in the Federal sector. And for each potential project, there are at least a dozen challenges. That's why this new quarterly bulletin is dedicated to supporting Federal solar energy champions. To make the lives of current and future solar champions a little easier, we want to provide the latest information on the technologies, policies, procurements, incentives, and other resources available to you.

This issue highlights incentives. We've included an application for Federal Energy Management Program (FEMP) 1998 funding that is still available for renewable projects. Also included is an article by Vince Schwent of the California Energy Commission; he reports on that state's incentive program of buydowns for solar electric systems.

Chuck Combs of the U.S. Navy reports on a joint solar water-heating project between the Navy and Hawaiian Electric Company (HECO). Without HECO's rebate program, the project couldn't have happened, and it will save taxpayers more than \$800,000. The rebates end in December 1998, so if your facility is in Hawaii, now is the time to install a solar system.

We encourage you to send us information about your agency's solar projects, for future issues. We'd like to start a Readers' Forum, too, so please send us questions along with your e-mail address. Since this is our first issue, we'd like your feedback. Would you like to receive this bulletin as an e-mail attachment, as a printed document, or posted on the FEMP Web site? Please send your input to Patrina_Taylor@nrel.gov along with your suggestions. ■

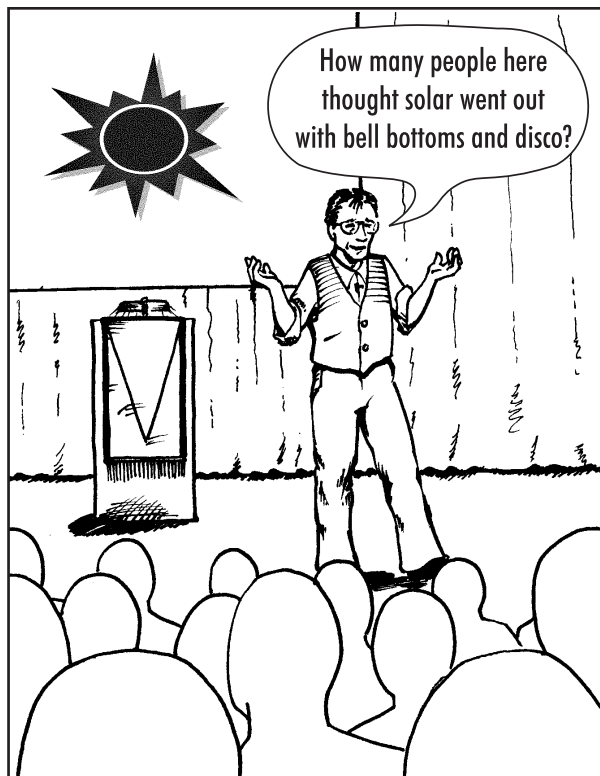
FEMP Has Funds for 1998 Federal Renewable Energy Projects

Adapted from an article for FEMP Focus
by Nancy Carlisle, NREL

There are still some funds (approximately \$500,000) available from FEMP to support cost-effective Federal renewables projects in FY 1998. If your agency has a promising renewable energy project that meets the criteria listed below, please fax the application form on page 3 by **April 30, 1998**, to Patrina Taylor at the National Renewable Energy Laboratory (fax: 303-384-7411).

These funds must be spent by September 30, 1998. However, for projects that need to be scheduled and funded in FY 1999 and FY 2000, it is also important that you contact FEMP as soon as possible. So please send in the application form even if your project is not ready for 1998 development. If your project qualifies, it will be added to a list of those seeking funding.

(Continued on p. 2)



WE'RE B-A-A-ACK!

Two major criteria must be met for your projects to qualify for FY 1998 funds:

(1) Your project must be for a Federal agency. Your agency must spend all the funds you request for system design, hardware, and installation by September 30, 1998.

(2) Your project must be cost effective, and meet the congressionally mandated 10-year payback requirement, after all state and utility rebates and tax credits are subtracted. This may also apply to FY 1999 and FY 2000 projects, as well. In addition, preference will be given to the following:

(a) Projects that involve multiple standardized systems installed at one or more locations (for example, a project in which an agency plans to install a particular renewable energy system on hundreds of military base housing units); the project should also include energy conservation measures.

(b) Projects that qualify under the President's Million Solar Roofs Initiative. Applicable Million Solar Roofs technologies include these:

Solar water heating: For buildings, swimming pools, solar system rehabilitation projects, etc.

Photovoltaics: For projects in cost-effective locations for PV.

Solar walls: For using transpired solar collectors in ventilation preheating.

(c) Projects in which these funds pay for the entire cost of a definite number of systems, to avoid issues involving "augmentation of Federal funds." Therefore, it is important to know how your agency will leverage the project's funding. For example, if 1,000 housing units are targeted for renewable energy systems on a military base, FEMP funds could cover the entire cost of systems for 100 of the housing units and the agency could pay for, or finance, systems for the rest of the units.

Preference will be given to easily replicated, standardized systems or pilots for larger projects. FEMP will consider pilot and demonstration projects if your agency has made a commitment to fund additional systems or replicate the project over time.

(d) Projects in which funds are used for DOE purchases of renewable energy system hardware. Preferred projects are those for which hardware designs and specifications have been completed, approvals have been received, and vendors have been identified. ■



Atlantis Energy, Inc./PIX04779

The California buydown program can help agencies purchase PV systems like this one in the entryway of the Thoreau Center for Sustainability at Presidio National Park, San Francisco.

California Buydown Program Aids PV Purchases

By Vince Schwent, California Energy Commission


California's new Emerging Renewables Buydown Program will help Federal agencies purchase photovoltaic (PV) electricity-generating systems in support of the Million Solar Roofs Initiative.

The California Buydown Program will provide sizable rebates to purchasers of eligible PV systems. The program will initially pay \$3 per watt of a system's electrical output, or up to 50% of the system's cost, whichever is less. The buydown thus offers a substantial rebate, given the current \$6 to \$12 per watt cost of a PV system.

To be eligible, grid-connected PV systems must be located on a building or other electricity-using facility in the service territory of one of California's three largest utilities: Pacific Gas & Electric, Southern California Edison, or San Diego Gas & Electric. Any Federal facility in these territories can receive the buydown for systems purchased either directly from a retailer or indirectly through an energy service company (ESCO). By coupling these rebates with the volume purchasing power of coordinated Federal purchases, agencies could economically obtain many of the 20,000 solar systems pledged by the government in support of the Million Solar Roofs Initiative.

The \$54 million buydown program is expected to last four years. However, the level of buydown payment will decrease during the course of the program. A retailer, purchaser, or ESCO can reserve a buydown payment for a planned purchase by submitting a simple, one-page reservation form to the program's administrator. When the system is installed, either the PV system retailer or the purchaser can submit a simple claim form to get a check for the buydown amount.

For more information about eligibility and guidelines on how to obtain a buydown, contact the California Energy Commission's Call Center, 1-800-555-7794 (or visit the Web site at <http://www.energy.ca.gov/renewables>). ■



"The method of the enterprising is to plan with audacity and execute with vigor."

Christian Bovee

FEMP Federal Renewable Energy Project Funding Application Form

(Please limit your application to two pages)

Name:

Address:

Phone/fax/e-mail:

Are you requesting funds for FY 1998? Yes _____ No _____

If you answered no, when do you think your project will be ready to implement?

Descriptive Information:

Describe the proposed project:

How much funding are you requesting for this project?

Economic Calculations:

(1) List all the costs associated with the project (design, hardware, installation, etc.):

(2) List all savings resulting from the project (utility cost savings, maintenance, other):

(3) Provide a simple payback calculation (initial capital cost divided by first-year energy cost savings for the project). If you have done a life-cycle cost (LCC) calculation, please attach it.

Spending Plan:

(1) Describe how you would spend these funds before September 30, 1998:

(2) Describe the feasibility studies that have been done on this project to date:

Leveraging Resources:

(1) Describe why this project should be funded (Does it leverage your agency's resources? Does it help increase the use of renewable energy in the Federal sector? How it will be showcased?):

(2) If this is a pilot project, please describe your agency's commitment to replicate it throughout the agency (this can be in an attached letter from your agency's Interagency Energy Task Force or 656 Committee member):

(Please copy or detach this form and fax it to Patrina Taylor, NREL, 303-384-7411.)



Hawaiian Electric Co., Inc./PIX05573

In partnership with Hawaiian Electric Company, the U.S. Navy installed 136 solar hot water systems on residences in its Moanalua Terrace family housing project.

The Navy and Hawaiian Electric Install Residential Solar Water Heating Systems

By Chuck Combs, U.S. Navy


As funding for facility maintenance and energy efficiency projects becomes more and more scarce, alternative funding mechanisms (such as utility rebate programs and energy-saving performance contracts) become more and more important. One good example of an energy project benefiting from a utility demand-side management (DSM) program is the Moanalua Terrace Phase II Navy Housing Project on Oahu, Hawaii, which was successfully completed recently by the U.S. Navy and Hawaiian Electric Company (HECO).

This project is part of the Navy's plan to renovate older housing units as well as to construct new family housing. High-efficiency electric water heaters were originally planned for the Moanalua complex. But the Navy was able to complete 136 homes using solar water heaters instead, as a result of the HECO Residential New Construction Rebate and Residential Efficient Water Heating Rebate Programs. Key personnel in the project were Guy Masuda of the Navy Public Works Center, Pearl Harbor, and Keith Block of HECO.

The HECO rebate program provides \$1,500 per solar water heating system. The total rebate to the Navy for this project was \$204,000. Total savings, based on 25-year life-cycle costs, are expected to be more than \$800,000, and the project should save nearly 627,000 kilowatt-hours annually. Another 516 homes now under construction in Phases III and IV could save the Navy an additional \$3 million over 25 years. Other military housing areas on Oahu, such as Ford Island in Pearl Harbor and the Pearl City Peninsula, are also being considered for solar thermal systems.

Innovative approaches like this are considered the wave of the future, in light of Federal budget reductions and today's emphasis on energy conservation and renewables.

For more information on the Moanalua Terrace project, contact Ted Arakaki, Naval Housing, 808-471-9630, ext. 304, or Keith Block, HECO, 808-543-4792. ■



"Behold the turtle. He makes progress only when he sticks his neck out."

James Bryant Conant

Solar Procurement: GSA Supplies Renewable Electricity to Federal Customers in New England

Condensed from an article for FEMP Focus by Roman Piaskoski, GSA


The General Services Administration (GSA) will be aggregating purchases of electricity for Federal agencies in the six-state New England region. The agency issued a request for proposals (RFP) that required bidders to supply a minimum of 4% of GSA's load from renewable energy sources. The anticipated contract award date was March 26. Deliveries under the contract should begin around May 1.

The contract runs for five years, with delivery order options of three and five years. The GSA anticipates that aggregating the electric load from 10 different agencies will be enough of an incentive to coax a supplier to beat the "standard offer," the price for continued service by the local utility.

After researching planned renewables portfolios in the region, GSA decided that 4% would be an appropriate percentage of the New England load for the contract. The agency requires that this 4% be made up of an approximately 50%-50% fossil-renewables mix. An example would be a wind farm that generates part of its load from wind and part from a gas-fired turbine. To encourage the development of local resources, however, GSA has also stated that a minimum of 1 megawatt of power should come from new sources by the year 2000.

Renewable energy technologies are defined in the new contract as those described in each state's enabling legislation. For states that do not have a definition, the Massachusetts definition applies; this defines a renewable energy source as one that generates electricity using photovoltaic or solar thermal electric energy; wind energy; ocean thermal, wave or tidal energy; fuel cells; landfill gas; municipal waste-to-energy technology; naturally flowing water and hydroelectric; and low-emission advanced biomass power conversion technologies, such as gasification, using biomass fuels (wood, agricultural, or food wastes, energy crops, biogas, biodiesel, or organic refuse-derived fuel).

For more information, contact Roman Piaskoski, Energy Coordinator, GSA New England, 617-565-4693, or Karen Curran, 617-565-4690. ■



BE A SOLAR CHAMPION

“There are three types of baseball players—those who make it happen, those who watch it happen, those who wonder what happened.”

Tommy Lasorda

■ **Spotlight on Technology:**

Transpired Solar Collectors — Inexpensive, Effective, Easy to Install

By Craig Christensen and David Crawford, NREL

Believe it or not, one of the ways your agency can help to meet the goals of the Million Solar Roofs Initiative is to install a new wall outside your facility.

These "solar walls," also known as transpired solar collectors, are a renewable energy technology that is well proven and readily available. Transpired solar collectors use solar energy to preheat ventilation (outdoor) air as it is drawn into a building. They have considerable potential in Federal facilities. They are ideally suited for buildings with at least moderate ventilation requirements, and work best in relatively sunny areas with long heating seasons.

A technology-specific Energy Savings Performance Contract (ESPC) for transpired solar collectors is being developed this fiscal year. The ESPC will make it easier for agencies to obtain and use the technology.

The technology itself is remarkably simple. A dark, perforated metal wall is installed on the south-facing side of a building. There is a gap of about 6 to 12 inches (15 to 30 cm) between the solar wall and the building's structural wall. The dark-colored wall acts as a large solar collector that uses solar radiation to heat ambient air. Fans mounted at the top of the wall pull outside air through the transpired collector's perforations, and the thermal energy collected by the wall is transferred to the air passing through the holes. The fans then distribute

the heated air into the building through ducts mounted near the ceiling.

By preheating ventilation air with solar energy, the technology removes a substantial load from a building's conventional heating system. This saves money as well as energy.

As of 1997, approximately 40 transpired solar collector systems had been installed worldwide. The system at the Ford assembly plant in Oakville, Canada, cut annual air-heating costs by 17%, paying for itself in five years. The system at the National Renewable Energy Laboratory's chemical waste storage facility, which requires a ventilation rate of 3000 cubic feet per minute, cut annual air-heating costs by 25.7%. Energy savings depend on the heating source being displaced.

A Federal Technology Alert (FTA) on the technology has been prepared under DOE's New Technology Demonstration Program. The FTA describes the transpired collector, its energy-saving mechanisms, and the factors that influence its performance. Worksheets help determine whether a facility is suitable for a transpired collector system and calculate the amount of energy such a system would save annually. A case study describes the performance of the transpired collector installed at General Motors' battery plant in Oshawa, Canada. Call Bob McLaren, 202-586-0572, or see the FEMP

A New Lease on Life for Solar Orphans

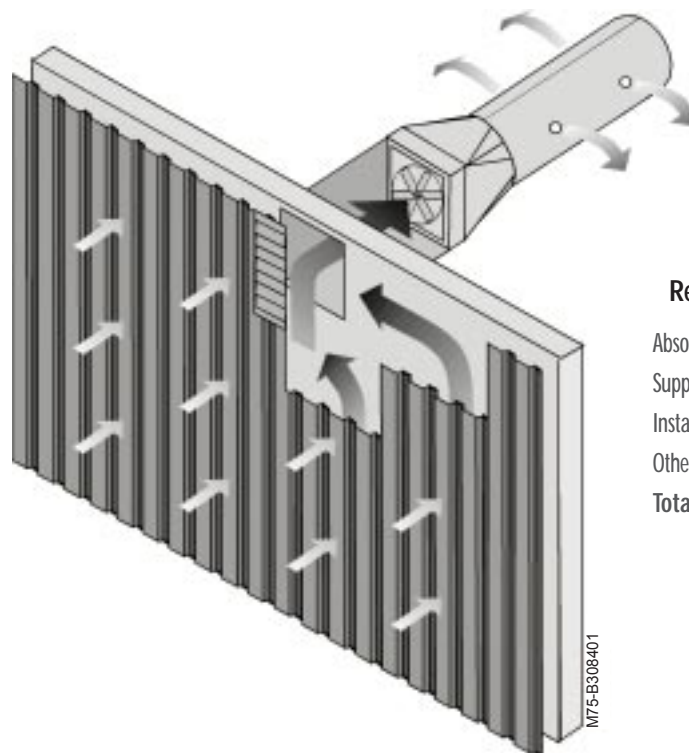
By Joseph Osborne, NREL

Before you dismantle that old solar system, there's something you should know. Today's technical advances, experienced contractors, and new financing opportunities can make solar system rehabilitation a viable alternative to removal. Some of the best candidates for this rehabilitation are large, nonoperational systems needing repairs or upgrades that could be financed through alternative financing options, such as Energy Service Performance Contracts, or ESPCs.

For more information, contact Joseph Osborne at NREL; phone: 303-384-7522; fax: 303-384-7411 (e-mail: joseph_osborne@nrel.gov).

Web site (<http://www.eren.doe.gov/femp/>) to obtain the FTA.

For more information about the transpired solar collector, contact Craig Christensen, NREL, 303-384-7510. ■



Installation Costs of a Retrofit Transpired Collector

Absorber	\$3.50/ft ²
Supports, flashing, etc.	\$2.50/ft ²
Installation	\$4.00/ft ²
Other Costs	\$1.00/ft ²
Total	\$11.00/ft²

This drawing illustrates the way that warmed air is drawn through a transpired collector and into a distribution duct.



Workers install an 8-kilowatt PV system on the roof of Western Area Power Administration's operations center in Folsom, California.

Western Area Power Administration/PIX05966

■ **Technology Demonstration:**

Building-Integrated Photovoltaics

By Bob Parkins, Sierra Nevada Region,
Western Area Power Administration

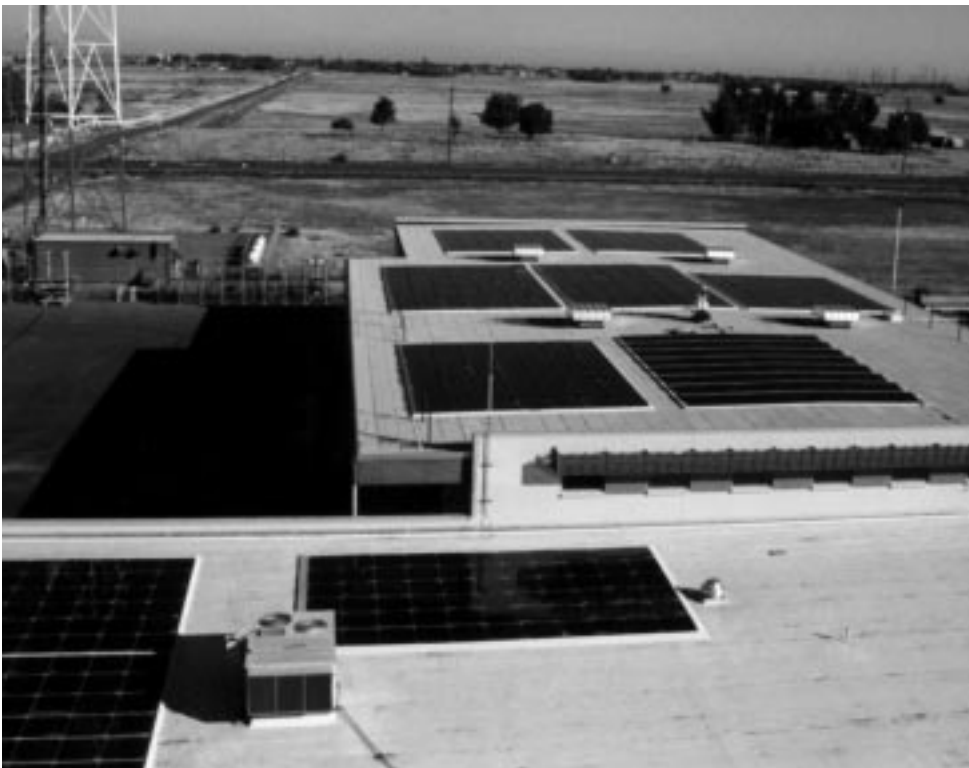
The Western Area Power Administration's Sierra Nevada Region (SNR) recently faced a dual challenge: promoting the greater use of photovoltaic (PV) systems as a renewable energy source, and doing so in cost-effective projects. SNR made significant progress in meeting this challenge in 1995 when it partnered with the Sacramento Municipal Utility District (SMUD) to install a 3-kilowatt (kW) prototype building-integrated PV system on its Operations Center in Folsom, California. The system incorporates PV panels into the roof, providing the building with a source of power generation as well as shelter from the weather.

Encouraged by the results, SNR Project Manager Krishna Shah and SNR Energy Services Manager Bob Parkins joined SMUD again in 1996 on a Utility Photovoltaic Group (UPVG) TEAM-UP project to place a similar 40-kW system at SNR's facility in Elverta, California. Western Area Power supplied funds equal to the cost of a much-needed new roof, and SMUD and UPVG provided funds for the PV components. Besides generating power, the PV roof system also reduced the building's cooling requirements, thus lowering its overall energy use.

The keys to the project's success include developing a long-range vision and seeking out partners and grants to leverage project costs and minimize the impact on power rates. Partnering has been a critically important step in managing risks and costs. Over time, the building-integrated system will pay back the original investment through extending the life of the roof, reducing maintenance costs, and providing insulation to reduce cooling costs, in addition to generating electricity.

Other keys to the project's success include installing systems incrementally, thus learning from previous experiences, and drawing on the technical expertise of others.

The PV systems have significant environmental benefits. The 40-kW system alone prevents 2,400 tons of carbon dioxide, 9 tons of nitrogen oxides, and 17 tons of sulfur



Two PV systems installed on the rooftop of the Western Area Power Administration's facility in Elverta, California; at least 70 kilowatts of PV are planned for this facility.

Western Area Power Administration/PIX05967

GSA Supply Schedule

GSA and FEMP are working together to encourage more solar suppliers to be listed on the GSA supply schedule. A new standing solicitation has been issued for Federal Supply Schedule FSC Group, Part 62, Part II. For more information, contact Vicki Moore, GSA Contracting Officer, phone: 817-978-8632; e-mail: vicki.moore@gsa.gov

dioxides from being emitted; these emissions would result from burning fossil fuels to generate the same amount of electricity.

In 1997, SNR awarded contracts for another 38 kW at Folsom and 24 kW at Elverta. The Folsom project will demonstrate three different PV technologies for educational purposes as well as power generation. The first 8 kW have been installed, and the remaining 30 will be installed over the next 18 months. The additional 24-kW system at Elverta will result in a total of 70 kW of solar generation there.

For more information, call Bob Parkins, SNR, 916-353-4490 (e-mail address: parkins@wapa.gov). ■

DOE's Regional Offices Support Million Solar Roofs Initiative

By Curtis Framel, DOE Seattle Regional Support Office

An emerging priority for the DOE Regional Support Offices (RSOs) is to assist in implementing the President's Million Solar Roofs Initiative. The RSOs are now developing regional implementation plans for the initiative that will support the deployment of solar technologies in the Federal sector by brokering public and private partnerships in each region.

These partnerships will identify and remove barriers to the installation of solar systems in Federal agencies; leverage financial resources as an incentive to the greater use of solar technologies; provide technical support to reduce the cost of deploying these technologies; and establish an infrastructure for delivering solar technologies throughout the region.

These activities will be performed in addition to other duties of the RSOs, which include assisting Federal facilities with regional renewable energy and energy efficiency projects. The RSOs support FEMP in delivering a full range of technical, financial, outreach, and related services to Federal agencies. This kind of support helps FEMP reduce the cost of government.

In carrying out their new role, the RSOs will provide several interrelated support services. These services will include information transfer, partnership development and coordination, training support, and publicity, which also includes recognition for successful projects in each region.



Warren Gretz, NREL./PIX00611

Ventilation air preheating systems, like this Solarwall® installed on a helicopter maintenance hanger in Colorado Springs, Colorado, qualify as solar energy retrofits under the Million Solar Roofs Initiative.

For more information about the services of the RSOs, contact your regional representative or the Million Solar Roofs (MSR) representative in the RSO:

Atlanta RSO (Southeast Region):
David Waldrop, 404-347-3483;
MSR: Steve Hortin, 404-347-0239

Boston RSO (Northeast Region):
Paul King, 617-565-9712;
MSR: Richard Michaud, 617-565-9713

Chicago RSO (Midwest Region):
Sharon Gill, 312-886-8573;
MSR: Mark Burger, 312-886-8583

Denver RSO (Central Region):
Randy Jones, 303-275-4814;
MSR: Steve Sargent, 303-275-4820

Philadelphia RSO (Mid-Atlantic Region):
Nancy Hapstak, 215-656-6961;
MSR: Susan Guard, 215-656-6965

Seattle RSO (Western Region):
Curtis Framel, 206-553-7841;
Arun Jhaveri, 206-553-2152;
Cheri Sayer, 206-553-7838;
MSR: Curtis Framel, 206-553-7841,
or Michael Lottier, 206-553-2156

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"Before everything else, getting ready is the secret of success."
Henry Ford

New York duty:
Bill Klebous, 212-264-0691

MSR Hawaii contact:
Eileen Yoshinaka, 808-541-2564■

**YOU HAVE
the POWER.**



A Federal Energy Management Program initiative, You Have the Power is designed to raise awareness of energy efficiency in the Federal sector.

**Find out more about it at
<http://www.eren.doe.gov/femp>**

FEMP
FEDERAL ENERGY MANAGEMENT PROGRAM

Treasure Chest: Conferences, Seminars, Publications, Web Sites, and Other Gems

Seminars and Events

SOLTECH 1998: State policy makers and energy suppliers will discuss how deregulating the electric industry will increase the use of solar energy. Participants will learn about opportunities in disaster relief, receive an update on the Million Solar Roofs Initiative, and meet many international guests. Sponsors include SEIA, UPVG, DOE, IREC, EPA, and several others.

Location: Orlando, FL
Dates: April 25-30, 1998
Contact: Ted Collins, FEMP, (202) 586-8017
www.eren.doe.gov/femp/events.html

PV Design and Installation Workshop:

Participants, from beginners to those seeking employment in the field, will learn PV system sizing, site analysis, hardware specification, and component selection; they will also install a system in the field and learn the proper use of tools and safety precautions. Sponsored by Solar Energy International.

Location: Carbondale, CO
Dates: May 18-30; June 29-July 10, 1998
Cost: \$950
Contact: (970) 963-8855
www.solarenergy.org/pvdi.html

Solar '98: Renewable energy for the Americas, featuring the conferences of the American Solar Energy Society, American Society of Mechanical Engineers, and American Institute of Architects.

Location: Albuquerque, NM
Dates: June 13-18, 1998
Contact: (303) 443-3130
www.ases.org/solar/

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 several sponsors.

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

Energy '98 — Breaking the Barriers: This first annual FEMP trade show will emphasize practical results, user-oriented information, and reports on how Federal facilities take projects from conception to completion. Topics include Super ESPCs, Operation and Maintenance, Energy Awareness, Procurement, and Technologies. This event will present the latest technologies and services available for energy projects and provide purchasing information.

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

PV Design On-Line: How to design PV power systems using Internet, textbook, software, and CD-ROM reference materials. Intended for those seeking employment in the solar industry and those wanting to use solar electricity themselves, the course teaches system sizing, site analysis, hardware, specifications, component selection, and how to make life-cycle cost comparisons. Given by Solar Energy International.

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

Publications

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

N. Carlisle, P. Taylor, and A.S. Crawley. 1997. "Federal Efforts to Implement Renewable Energy Projects." *Proceedings of the 22nd National Passive Solar Conference, 25-30 April 1997, Washington, D.C.* Boulder, CO: American Solar Energy Society;

pp. 231-236. Article describes contracting mechanisms that Federal agencies can use to finance renewable energy projects. NREL doc. no. TP-22558; contact NREL's Document Distribution Service, (303) 275-4363.

Web Sites

See these Web sites for more information on solar energy technologies and the Million Solar Roofs Initiative (<http://www.eren.doe.gov>):

MillionSolarRoofs.org
eren.doe.gov/femp
fsec.ucf.edu
seia.org

For More Information:

FEMP Help Desk:
1-800-363-3732

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