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U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy

March/April 2002

“We overcame a number of obstacles especially in identifying and securing project funding. But all parties involved were eager to transform the idea into reality, support the Homa Bay facility, and promote renewable energy systems.”

—Scott Waldman
Department of Health and
Human Services

HHS Solar Energy Project Enhances CDC Health Care Facility

The CARE-Centers for Disease Control and Prevention (CDC) Health Initiative facility in Homa Bay, Kenya, will soon benefit from a solar energy power system that will provide more reliable power and reduce losses of vital medicine and laboratory test samples. The facility houses an on-site laboratory that supports a project to reduce diarrheal diseases using a simple household-based method to improve water quality.

The laboratory has experienced frequent power outages that required excessive use of an emergency diesel-powered generator. No routine maintenance is performed on the generator, due to the location of the laboratory and lack of maintenance staff. Therefore, when repairs are necessary, funding that could be used for the mission of the clinic is used for extensive repair and replacement of the generator. On average, the generator is replaced every 5 years. This is in addition to the expense of the high-cost diesel fuel to power the generator.

To reduce the site's power disruptions, CDC Medical Officer Rob Quick teamed up with the Department of Health and Human Services' (HHS) Energy Officer Scott Waldman and HHS' Energy Services Contractor Diana Hirshfeld to initiate a project to install a photovoltaic module for the laboratory. Working with CDC's Rita Oberle, Director of the Office of Facilities Planning and Management, HHS submitted the CARE-CDC solar project for funding in response to FEMP's FY 2001 call for distributed energy resources (DER) projects. Oberle provided her office's assistance with the design and procurement aspects of the project. “The endeavor to install a solar energy system at the Homa Bay laboratory was a culmination of the dedication of CDC personnel in many different offices, HHS Energy Program management, and DOE,” said Quick.

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... and more!

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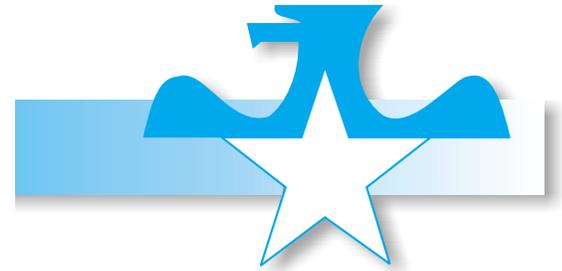
- Requires agencies to buy ENERGY STAR® or FEMP designated products when cost effective.
- Applies to ALL operations, maintenance, and construction contracts for product acquisitions.
- See page 24 for more information.

2002 Federal Energy and Water Management Awards and the Presidential Awards for Leadership in Federal Energy Management



Beth Shearer
FEMP Director

Each year, the Department of Energy in conjunction with the Federal Interagency Energy Policy Committee (656 Committee) sponsors the Federal Energy and Water Management Awards to honor organizations and individuals who have made significant contributions to the efficient use of energy and water resources in the Federal government.



It is time to select Award winners to be recognized for work accomplished during FY 2001. The criteria and guidelines for the 2002 Federal Energy Awards have been mailed to agency energy coordinators, Federal Interagency Energy Management Task Force members, Federal Interagency Energy Policy Committee members, and DOE Regional Officers and Directors. The criteria and guidelines are also available on the FEMP web site at www.eren.doe.gov/femp/prodtech/awards/awardsprog.html. **All nominations should be sent to the office of the Federal Energy Management Program to arrive no later than May 17, 2002.** Please read and follow the criteria and guidelines closely to prevent disqualifications. Nominees for the Federal Energy and Water Management Awards will also be evaluated to receive Presidential Awards for Leadership in Federal Energy Management.

Send all nominations to:

Office of the Federal Energy Management Program, EE-90
Federal Energy and Water Management Awards
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585-0121

For more information on the Federal Energy and Water Management Awards or the Presidential Awards for Leadership in Federal Energy Management, please contact Nellie Greer of FEMP at 202-586-7875 or nellie.tibbs-greer@ee.doe.gov, or Annie Haskins of FEMP at 202-586-4536 or annie.haskins@ee.doe.gov.

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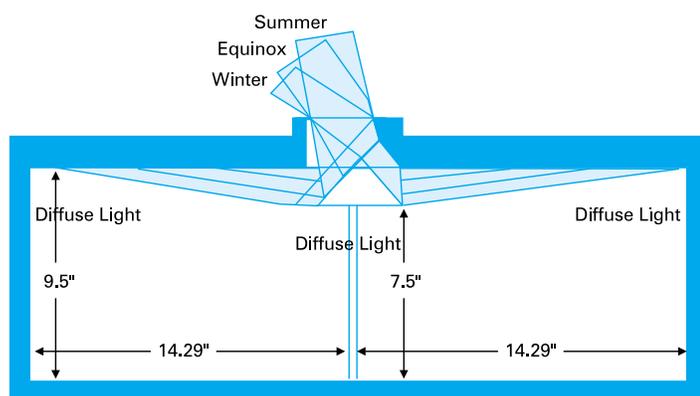


Federal Energy Managers See Daylight To Energy Savings

Federal energy managers working to cut energy costs are finding that the decision to implement daylighting projects can be an easy one. Daylighting significantly cuts energy use for lighting building interiors—reductions of up to 75 or 80 percent have been seen in some facilities. Projects usually have a short payback period, and daylighting has wide applicability to many different types of buildings.

Proper daylighting involves much more than simply adding windows or skylights to a space. Daylighting is the method of admitting maximum natural light, while balancing heat gain and loss, glare control, and variations in daylight availability. Successful daylighting is implemented through proper design, placement, and orientation of skylights, clerestories (vented skylights), and other sources of natural light.

Some daylighting devices resemble conventional skylights but eliminate the problems of glare, inadequate light distribution, and poor thermal insulation that often occur with skylights. These devices may have a clear dome shape or have a hemispherical shape. Daylight is guided from the dome to the room with a reflective shaft. A diffuser at the bottom of the shaft ensures that both glare and heat from the direct beam is minimized. In many units, dead air spaces built into the system reduce the heat loss or gain typically experienced with standard skylights.



This illustration of a daylighting device redirects sun to both the north and south sides of the shaft. A reflector array beneath a small opening reflects diffuse light to the ceiling, as well as distributes diffuse light to the area directly below the reflector.

Commercial daylighting devices are either passive or active units. Passive units have no controls, but active units have mirrors under the dome that track the sun to increase the hours of useful sunlight available to the device. Some units have louvers that control and filter light. Commercial units also have automatic lighting controls that turn off artificial lighting when daylight devices produce sufficient light levels.

The benefits of daylighting projects are numerous. Most important is the energy savings derived from minimizing or eliminating the need for artificial light. The DOE National Renewable Energy Laboratory's (NREL's) Thermal Test Facility, located in Golden, Colorado, was designed with stepped, clerestory windows. The building uses 75 percent less energy for lighting than a building without daylighting features. Except for the central service area, NREL's Thermal Test Facility is lit entirely by daylight entering through clerestory windows. Additionally, daylighting decreases the energy load imposed on a building's mechanical cooling system. The energy savings from reduced electrical lighting can reduce energy use an additional 10 to 20 percent. As a result, for many commercial buildings, total energy costs can be reduced by as much as one-third through the optimal integration of daylighting strategies. Good lighting controls that turn off lights when daylight provides enough light are a very important element for achieving energy and cost savings.

Daylighting can also increase the comfort of building occupants. Although difficult to quantify, daylighting generally improves occupant satisfaction and visual comfort, leading to better performance. The human eye can adapt easily to natural light, and the light gives occupants a pleasant connection with the outdoors. Various studies suggest that daylighting increases worker productivity, benefits student learning and health, and contributes to higher sales in retail stores.

Most energy managers are familiar with the fast payback on conventional building lighting upgrades, but many are surprised that daylighting projects frequently pay back just as fast or faster. A hangar at Fort Huachuca, near Tucson, Arizona, was retrofitted with 36 daylighting units at a total cost of \$45,000. Each unit installed displaced a 1,175-watt light fixture. The

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HHS SOLAR ENERGY PROJECT ENHANCES CDC HEALTH CARE FACILITY

(continued from page 1)

In April 2001, the CARE-CDC Homa Bay solar energy project was selected as a recipient of FEMP's DER equipment funding. FEMP's technical assistance included project design recommendations, and CDC assisted with the shipment of hardware and funded the installation. "We overcame a number of obstacles especially in identifying and securing project funding. But all parties involved were eager to transform the idea into reality, support the Homa Bay facility, and promote renewable energy systems," stated Waldman.

Harry Marsh, Program Manager for the CDC National Center for Infectious Diseases, Facilities Planning and Project Management Office, is managing the project's logistics including procuring, shipping, and installing the system overseas. Working with his colleagues, Marsh is addressing the many challenges inherent in a project of this type. For example, originally, the plan was for the hardware for the 2-kilowatt solar system to be flown to Kenya. However, once it was learned that the storage batteries for the system weighed approximately 3,000 lbs., it became apparent that the hardware would need to be shipped to Africa on a freighter. Marsh has obtained the assistance of the State Department for the ground shipment of the equipment to its final destination once the hardware arrives by ship. In addition, he is working with CARE-CDC to plan the installation of the solar panels in a useful carport-type structure to shade transportation vehicles. The solar system is expected to be installed by July 2002.

"The HHS Energy Program advocates the use of renewable energy systems and searches for projects throughout the Department to champion. The CARE-CDC Homa Bay installation offers a chance to make a significant difference in the energy consumption and environmental impact of an HHS-affiliated facility," said Waldman. Not only will the program work to replicate this type of project in the agency's facilities, but will use it to educate HHS facility managers and employees, and visitors of the clinic. "Most importantly, the CARE-CDC Homa Bay laboratory will now have a more reliable energy source that will allow the CARE-CDC staff to address the real needs and goals of the facility—improving the health of the Kenyans," added Marsh.

For more information, please contact Harry Marsh of CDC at 404-639-0292 or ham@cdc.gov, or Diana Hirshfeld of HHS at 703-620-4330 or dhirshfeld@aol.com.

FEDERAL ENERGY MANAGERS SEE DAYLIGHT TO ENERGY SAVINGS

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daylighting devices were carefully monitored over a 35-month period to assess the energy savings. Over the monitored period, the daylighting devices saved a total of 268,990 kilowatthours of electricity. Including the demand charge savings, the annual savings was \$9,600 per year, producing a simple payback of only 4.7 years. This short payback makes this technology an attractive opportunity for energy savings performance contracts.

Daylighting technology has been used extensively at Fort Huachuca for several years. In the past 4 years alone, 400 daylighting units have been mounted in 22 buildings on the post, demonstrating the wide applicability of the technology. At the Marine Corps Air Station in Yuma, Arizona, the devices have also been widely used. In conjunction with the local utility's demand side management program, 226 units have been installed in 7 buildings, including warehouses, a vehicle maintenance bay, and a gymnasium.

Daylighting devices have been installed in DOD housing, aircraft hangars, auto shops, child development centers, machine shops, stores, and office buildings. These devices have been installed on various roof types, including metal roofs with slopes, flat roofs, and built-up, low-slope roofs.

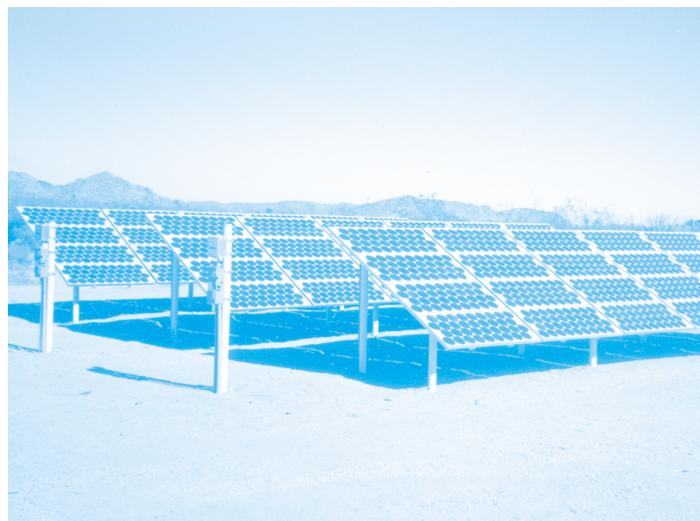
Energy managers experienced with daylighting projects point out there are pitfalls to avoid to ensure successful projects. Avoiding glare and overheating is essential. Lockable covers should be installed on the automatic lighting controls to prevent occupants from tampering with the adjustments and defeating cost-efficient operation. The walls, floors, and ceilings of daylighted rooms should be painted a light color to provide uniform light distribution. Roofs where the systems are to be installed should be watertight and free of lead paint. Finally, it is usually most successful to have a single contractor supply and install the product.

Federal energy managers have learned that daylighting strategies can make Federal facilities more energy efficient, more comfortable, less expensive to maintain, and more environmentally benign. Share your success stories. If you are making daylighting projects happen at your Federal facility, please submit your project descriptions to Annie Haskins at annie.haskins@ee.doe.gov.

For more information, please contact Dave Menicucci of Sandia National Laboratories at 505-844-3077 or dfmenic@sandia.gov; Ron Durfey of MCAS Yuma, Arizona, at 928-269-2734 or durfeyrj@yuma.usmc.mil; or Bill Stein of Fort Huachuca, Arizona, at 520-533-1861 or william.stein@huc.army.mil.

To learn more about daylighting and other sustainable building design strategies, make plans to attend FEMP's Designing Low-Energy, Sustainable Buildings on April 18-19 2002 in Golden, Colorado. For more information on this training and the web-based course, please see www.sbicouncil.org. Also the National Institute of Building Sciences' "Whole Building Design Guide" provides helpful information on daylighting techniques and strategies. The guide is available at www.wbdg.org.

Joshua Tree National Park's Commitment to Solar Still Going Strong



Joshua Tree National Park's 7.2 kilowatt PV system serves the Cottonwood area.

President Franklin D. Roosevelt established the Joshua Tree National Park in 1936 to protect significant examples of the Mojave and Colorado Desert ecosystems. Until 1998, diesel-powered generators were the primary source of power to sustain operations at the remote Cottonwood visitor use area and employee housing facility located in the southeast portion of the Park. In 1998, the Park replaced two 32-kilowatt diesel generators with a 21-kilowatt photovoltaic (PV) power array system and a 30-kilowatt propane backup generator that now totally support the electrical power needs of the Cottonwood area. Since this first PV installation was complete, more systems have been added to the Park, and an end to continuing installations does not appear in sight.

The most recently-completed PV system is a grid-tied system at the North Entrance station. It consists of a 2.4-kilowatt PV system and a 2.5-kilowatt

Xantrex/Trace Sun Tie inverter. This system will offset most of the energy use of the entrance station.

Another recently-installed system is the PV hybrid power system for the well that serves the Cottonwood area. It consists of approximately 7.2 kilowatts of PV capacity, an AeroVironment Universal Solar Pump Controller, and a back-up, propane-fired electric generator. This system provides most of the power for the well pump.

A 30-to-60 kilowatt grid-tied system for the Oasis Visitors Center is now in the conceptual design stage. The system will consist of Building Integrated PV (BIPV)

with a grid-tied inverter. The BIPV will be installed on the existing artifacts storage and GIS buildings, reducing their cooling load. A large waterproof PV roof structure will be built over the maintenance yard to allow for storage of equipment and supplies and provide a gathering area for Joshua Tree personnel. The anticipated completion date for this project is late-summer 2002.

Despite a theft last summer at the Park's Indian Cove Amphitheater that cost the Department of the Interior \$6,000 in PV panels, Joshua Tree National Park continues to be a national model for its use of off-grid solar powered PV systems. All new PV systems at Joshua Tree are now welded or riveted on to make them theft-resistant, allowing concentration to shift from theft worries back to adding more solar.

Joshua Tree National Park has been a recipient of a Federal Energy and Water Management Award, as well as a Federal Energy Saver Showcase Award for its dedication to PV installation.

For more information, please contact Otto VanGeet of the National Renewable Energy Laboratory at 303-384-7369 or otto_vangeet@nrel.gov.

Tour Joshua Tree National Park During Energy 2002

A tour of Joshua Tree National Park will be held on Sunday, June 2, 2002, in conjunction with FEMP's Energy 2002 Workshop and Exposition. See the Park's renewable energy systems along with other interesting sites during this day-long tour. The Park is located 80 miles from the Energy 2002 Workshop site, and transportation is provided. Cost of the tour is \$25 per person.

For more information on the tour and to register, visit the Tours page of the Energy 2002 web site at www.energy2002.ee.doe.gov/Tours.htm.

Energy 2002 Workshop & Exposition to Highlight Renewable Energy Solutions

Using renewable energy has many benefits, including: reducing the need to consume precious fossil fuels, providing modular units for more flexibility, lowering atmospheric pollutants, mitigating the impacts of fuel price volatility, and shortening project lead times due to easier installation requirements. In addition, renewables such as solar energy offer reduced maintenance, lower operating costs, stand-alone capabilities, and versatility. Energy 2002, “Hot Challenges, Cool Solutions,” highlights these benefits at its June 2-5, 2002 workshop in the Renewable Energy Track.

Energy 2002 is the fifth annual national energy efficiency workshop and exposition for Federal energy managers and others in the energy business. It offers 11 specialized learning tracks with up to eight sessions related to energy and energy efficiency. The event is sponsored by DOE’s Federal Energy Management Program, and co-sponsored by the Department of Defense and the General Services Administration. Energy 2002 will be held at the Palm Springs Convention Center, in Palm Springs, California.

Eight sessions in the Renewables Energy Track are designed to provide step-by-step methods of evaluating energy supply options. The steps include site surveys, cost estimation, design and construction, operations and maintenance, and case studies of successful projects. Energy managers and related professionals can discover new opportunities for partnerships with governments, utilities, and industry. The eight sessions are:

Solar Thermal Applications will provide an overview of solar thermal applications and how these systems work. Attendees will learn about residential, commercial, central station solar thermal applications—including potable water heating, pool heating, solar-powered absorption chilling, and electricity generation; the mechanics and dynamics of the technology; and, the benefits for municipalities, government agencies, the Armed Forces, schools, universities, community organizations, and industry.

Geothermal Energy Rocks! will give participants an in-depth look at the growing use, variety, and potential of geothermal systems. Speakers will address geothermal systems and how Federal government programs are further advancing geopower and ground source heat pump technology. They will explore methods of collecting geothermal energy as well as look at the largest geothermal application at China Lake, California. The U.S. Fish and Wildlife Service will explain in detail how they are using geothermal energy to achieve fossil fuel reductions in their buildings through case studies of successful projects.

Blowing in The Wind will inform participants of the benefits of power generated from wind. The discussion will cover how research, development, and demonstration efforts, such as Wind Powering America, improve renewable energy processes. Speakers will guide attendees through the process of completing a successful wind project, and examine the technical aspects from beginning to end by looking at siting,

sizing, and financing options. Experts also will provide an in-depth look at the installation of wind systems, and describe the operations and maintenance requirements of a project.

Waste To Watts will demonstrate the viability of using waste streams as a source of reliable power generation. Participants will learn how the current volatility in the supply and price of natural gas forces us to look at new alternatives for power production. They will gain valuable knowledge on converting these liabilities into assets. Among the technologies investigated will be: biomass, flare gas, coal bed methane, landfill gas, and municipal solid waste.

Building Integrated Photovoltaics (BIPV) will provide attendees with information on how this technology is gaining in popularity and use. Presenters will demonstrate the feasibility of incorporating BIPV in both existing and new construction projects and how BIPV’s work. They will examine the integration of BIPV and energy efficiency to achieve an optimally performing building, review the products available on the market today, and discuss the installation and maintenance of BIPV systems.

Renewables and R&D will examine new research and developments on the horizon for renewable energy resources. Attendees will get the latest information on what’s being done to create new renewable power sources as well as increase the efficiency of existing

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GSA Northwest Arctic Region Completes Second PV System

Partnering with DOE, the General Services Administration's (GSA) Northwest Arctic Region installed and commissioned a 10-kilowatt photovoltaic (PV) system at the Federal Building and U.S. Post Office in Wenatchee, Washington. DOE provided funding for the study and the design of the project, and GSA funded the purchase and installation of the solar panels and ancillary equipment. The GSA Wenatchee PV project supports the Planet GSA program, the Million Solar Roofs Initiative, and Executive Order 13123.

GSA's Wenatchee PV system features an array of 132 polycrystalline solar panels manufactured by BP Solar and a Xantrex Technologies 3-phase voltage inverter. The 2x4-foot solar panels each generate approximately 70 to 75 watts each of electricity. "This project demonstrates GSA's commitment to the environment. Clean energy and cost effective alternatives such as PV are more important than ever," said Robin Graf, GSA, Assistant Regional Administrator for Public Buildings Service.

Another feature of the project is GSA's participation in the Chelan County Public Utility District's Sustainable Natural Alternative Power (SNAP) generation program. Under the

District's SNAP program, GSA will receive up to \$1.20 credit towards its electricity account for every kilowatt of capacity generated by its PV system for the next 10 years.

Graf noted, "In addition to the economic benefit of the project, the environmental benefits are enormous." The system will generate more than 400 megawatthours of electricity over the next 25 years and reduce emissions by 390,650 lbs. of carbon dioxide; 357 lbs. of sulfur dioxide; and 100 lbs. of nitrogen oxide. GSA will collaborate with Bonneville Power Authority (BPA) to monitor and publish the performance of the system.

The GSA Wenatchee PV project is GSA Northwest Arctic Region's second PV project. In 2000, GSA partnered with BPA, DOE Seattle Regional Office, WesternSUN, and others, to install a 2-kilowatt PV system on the rooftop of GSA's Building Blocks Daycare Center. The daycare center located next to GSA's Regional Headquarters in Auburn, Washington, will generate 60 megawatthours of electricity over the next 25 years.

For more information, please contact Michael Okoro of GSA at 253-931-7945 or michael.okoro@gsa.gov.

ENERGY 2002 WORKSHOP & EXPOSITION TO HIGHLIGHT RENEWABLE ENERGY SOLUTIONS

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renewable energy sources. Presenters will detail R&D efforts to increase efficiency and lower production costs for PV systems. This session will also examine tidal power technology, converting ocean waves into power generation, and look at how the Navy is taking advantage of wave power generation.

Renewable Energy Case Studies will demonstrate the practicality of successful renewable energy projects. Participants will learn how others have completed successful renewable energy projects in a diverse mix of applications. Presenters will illustrate the benefits of renewable energy projects through examples of PV, wind, geothermal, and solar hot water

heating applications. The audience will look at the entire project phase from design and construction to operations and maintenance through the eyes of the experts who have valuable field experience and can pass on the lessons they have learned.

Financing Your Renewable Energy Projects informs participants of the financial incentives and financing options available for renewable energy projects. After evaluating all the potential energy efficiency projects that you possibly can, what's the next step? Implementing your renewable projects. You've decided to put your beliefs into practice, but how will you pay for it? Presenters will review

financial incentives and rebates that are available and how to find them. Attendees will look at different alternatives and scenarios to strategically maximize the benefits from these incentives for Federal agencies and others. The audience also will learn how to finance renewable projects through energy savings performance contracts.

Energy 2002 program and registration information is available at www.energy2002.ee.doe.gov, or by calling 800-395-8574. For more information, please contact Rick Klimkos of FEMP at 202-586-8287 or rick.klimkos@ee.doe.gov. For exhibitor information, please call 410-997-0763, or e-mail inquiries to energy@eponline.com.

Federal Agencies Increase Renewable Power Purchases

Federal agencies throughout the country are actively seeking opportunities to buy renewable power for their sites. In Denver, approximately 30 agencies have fulfilled their commitment to purchase electricity generated by wind turbines. Agencies in other regions are increasing purchases of renewable energy as well, signifying their full support for using renewable power to meet Federal energy needs.

In the spring of 2000, 30 agencies committed to purchase the equivalent of 10 megawatts of wind power through Xcel Energy's Windsource® program. The Denver Federal Executive Board, which represents over 130 Federal agencies in the Denver area, led the initiative to encourage Federal agencies to sign up to purchase wind power. "This purchase of wind power by Federal agencies reflects a commitment to a clean, renewable power source," said Mike Hacskaylo, Administrator of the Western Area Power Administration and Denver Federal Executive Board Chairperson. The implementation team consisted of staff from DOE's Golden Field Office, DOE's Denver Regional Office, DOE's National Renewable Energy Laboratory (NREL), the General Services Administration (GSA), and the Environmental Protection Agency (EPA). (See "Federal Agencies in Denver Commit to Wind Purchases Equivalent to 10 Megawatts," *FEMP Focus*, May/June 2000.)

To build support for the partnership, the team contacted large users individually and organized a "sales" meeting for the smaller agencies to explain the initiative. "Building collaboration across agency boundaries is always difficult in government," noted Bill Becker, Director of DOE's Denver Regional Office. "But on this project, Federal agencies in Denver came together brilliantly to support something we all believe in—clean air and clean power."

In November 2001, participating Federal agency staff celebrated the Denver wind power initiative with a tour of Xcel Energy's (formerly Public Service Company of Colorado) Ponnequin Wind Farm. Located north of Denver, near the Wyoming border, the wind farm has 30 wind turbines for a total capacity of 30 megawatts. "For many of us who have toured conventional power plants, the visit to Ponnequin was dramatic. Instead of pipes and smokestacks and steam and the roar of equipment, the wind turbines at Ponnequin were as

quiet as a sailboat slicing through the water—a gentle swooshing sound. Ponnequin definitely is demonstrating a new paradigm in power production," added Becker. Xcel Energy also purchases approximately 30 megawatts of wind power from Cinergy Global Power's wind farm located in Peetz, Colorado, just south of the Nebraska border.

The Windsource® program is the largest customer-driven wind energy program in the nation. It is a "green pricing" program that allows customers to voluntarily support renewable energy development. Windsource® subscribers can purchase any number of 100 kilowatt-hour blocks of wind energy for \$0.025 cents per kilowatt-hour. "Xcel Energy is pleased to offer its Colorado customers the opportunity to choose how their electricity is generated through the purchase of wind power through Windsource®. Many Federal agencies in this State have taken a leadership role in supporting renewable energy development in our country and in Colorado through their substantial Windsource® purchases," said David Wilks, President of Energy Supply, for Xcel Energy.

Other agencies are also making significant commitments to purchase renewable energy. The National Aeronautics and Space Administration's Johnson Space Center in Texas recently signed a 3-year electricity contract that includes 5 percent renewables (10 million kilowatt-hours out of a total 200 million kilowatt-hours). The premium for the renewable portion of the contract is approximately \$0.01 per kilowatt-hour. The Defense Energy Support Center was the electricity procurement agency for this purchase. As one of the Federal electricity procurement agencies, GSA is encouraging Federal agencies on the east coast and in Texas to purchase renewable power as part of their upcoming electricity procurements—an easy way for agencies to meet the 2.5 percent Federal renewable energy goal by FY 2005.

The EPA continued their commitment to renewable power in 2001 with the signing of a 100 percent renewable energy credits (also known as "green tags") contract between their Cincinnati, Ohio, site and Community Energy. The purchase, at 15.6 million kilowatt-hours, is the EPA's largest to date. EPA also purchases 100 percent renewable power for their facilities in Golden, Colorado; Richmond, California; Manchester, Washington; and Chelmsford, Massachusetts. Plans are underway for renewable power purchases for several additional EPA facilities around the country.

For more information or for assistance with renewable power purchases, please contact Chandra Shah of NREL at 303-384-7557 or chandra_shah@nrel.gov, or David McAndrew of FEMP at 202-586-7722 or david.mcandrew@ee.doe.gov.

DOE Boston Regional Workshops Examine Renewable Energy Opportunities in the Northeast

Last fall, the DOE Boston Regional Office sponsored two renewable energy and combined heat and power (CHP) workshops for Federal energy managers in New England and New York. The workshops were a response to rapid developments in both on-site power technologies and related State and utility funding resources. The goal of the Albany, New York, and Sturbridge, Massachusetts, workshops was to bring Federal energy managers together with technology professionals and potential State and utility funding and technical assistance partners. Critical issues discussed during the workshops included renewable energy resources in the Northeast, lessons learned from recent solar and wind installations, and project financing options.

In an interactive session on wind and solar energy, Bill Moore, Principal of Atlantic Renewable Energy Corporation and Richard Perez, Research Professor at State University of New York at Albany, Atmospheric Sciences Research Center, presented research on New York and New England's significant potential for wind and solar-generated power. Moore demonstrated wind-mapping software developed by TrueWind Solutions LLC. Using TrueWind's mapping software, he identified the location of Atlantic Renewable

Energy Corporation's recently completed 11.5-megawatt wind farm in Madison, New York.

A panel on solar power included a presentation by Perez regarding his research on New York's solar capacity. He presented findings detailing 3 years of weather satellite observation data with peak load shapes (sunny summer days) in the New York City metropolitan area and concluded that the high incidence of maximum solar output with peak energy demand is favorable for photovoltaic installations in the area. Leigh Seddon of Solar Works and David Eisenbud of Powerlight Corporation provided information on the benefits and performance of large-scale installations of flat roof mounted solar panels.

A session on CHP featured an overview by Dave Hoffman, President of Celerity Energy, on the regional capacity for reciprocating engines as a distributed energy resource (DER). Hoffman outlined Celerity Energy's goals to develop DER systems in blocks of 400 kilowatts to 3 megawatts to provide peak generation capacity to New York State's wholesale electricity market. The other CHP presentations addressed the design and output of microturbine systems.

The workshops included detailed presentations on renewable energy and DER funding programs as well as current and expected regional opportunities for purchasing green power and green certificates. "Each State has its own funding guidelines and particular emphasis," said Paul King of DOE's Boston Regional Office. "It takes extra effort on the part of a regional energy manager who has facilities in several States to locate the best renewable energy projects. We got everyone in the same room and on the same page."

For more information, please contact Paul King of the DOE Boston Regional Office at 617-565-9712 or paul.king@ee.doe.gov.

Are You an Energy or Environmental Manager Interested in Renewable Energy?

FEMP's Renewable Power Purchasing Program would like to assist all interested agency representatives in purchasing renewable energy for their facilities. FEMP is available to assist Federal agencies with renewable power purchases by:

- Evaluating renewable power purchasing options (whether it is a regulated utility green pricing program, competitive

procurement in a State with a competitive electricity market, or green tags/renewable energy credits);

- Coordinating renewable energy purchases with the utility company (if the utility company already has a regulated utility green pricing program);
- Coordinating with the utility company to develop a green pricing program (if the utility does not have a green pricing program); and

- Organizing a competitive electricity or a renewable energy credit procurement—assisting with solicitation development, publicizing the solicitation, organizing bidder's meetings, and evaluating bids.

For more information on the purchase of renewable energy, please contact David McAndrew of FEMP at 202-586-7722 or david.mcandrew@ee.doe.gov, Chandra Shah of NREL at 303-384-7557 or chandra_shah@nrel.gov, or Bill Golove of LBNL at 510-486-5229 or whgolove@lbl.gov.

Postal Service Installs Largest Federal Roof-Integrated Solar Photovoltaic System

The U.S. Postal Service (USPS) recently installed a landmark photovoltaic (PV) demonstration project at its Marina Processing and Distribution Center in southern California. The 409,630-square-foot facility was USPS's ideal choice to save money, answer the State's call to reduce electricity demand, and demonstrate the viability of PV systems. The project features a 127-kilowatt PV installation on the facility's flat roof and is expected to save \$25,000 to \$28,000 per year. USPS chose PowerLight Corporation to install the facility's PV system, in part, because no roof penetrations were required. In addition, their proposed system has the benefits of added insulation and roof-life extension.

The PV system is linked to a new energy management system (EMS) from CMS Viron Energy Services that monitors power output from the solar cells. When the EMS detects a decline in power output—for instance: cloud cover overhead—it automatically modifies the operation of the building's chiller to compensate without affecting employee comfort. As a result, high demand charges from conventional power surges during PV generation drop-offs are avoided. Such constant reductions in peak demand also benefit the State's electricity grid. Joe Vanden Berg, USPS Area Energy Manager, remarked that "the EMS has the potential to deliver significant extra savings."

Ray Levinson, USPS Area Environmental Manager, noted that "the site's pro-active management team was essential to selecting the project location." Dave Doty, Marina Operations Support

The USPS Marina Processing and Distribution Center's 127-kilowatt PV system in southern California.



Specialist, said he has recommended PV to management in the past. His interest stems from his observation that PV translates to "big savings for us and to the State as well."

According to Levinson, "A strong partnership made this project possible." In addition to the commitment by USPS management and site operations managers and the efforts of the technology providers, DOE's Lawrence Berkeley National Laboratory (LBNL) played a technical advisory role. The Los Angeles Department of Water and Power and FEMP's Distributed Energy Resources Program provided key financial incentives that reduced the total cost of the project to USPS to \$225,000.

All involved thought that the process went very smoothly. Levinson attributed this to "the willingness of people to be open-minded. This was particularly important because it is a demonstration project, and not a typical energy efficiency project. Once we got everyone's buy-in, the project nearly completed itself." Vanden Berg added that the professionalism of the people at PowerLight also contributed to its

smooth execution. Recently, USPS held a dedication ceremony in honor of the completion of the PV project. USPS officials, FEMP Director Beth Shearer, and other State and local officials participated in the event.

USPS hopes to determine the potential for future installations based on the performance of this project. To this end, PowerLight will monitor and evaluate the system for 2 years. Dan Shugar, Executive Vice-President of PowerLight noted, "This installation showcases the U.S. Postal Service's energy and environmental leadership. Based on the success of this project, we hope to see a series of cost-effective PV installations at USPS facilities across California and the rest of the country." Bill Golove of LBNL echoed these sentiments. He said, "The U.S. Postal Service has long demonstrated significant leadership in moving toward an economically-sound sustainable energy future."

For more information, please contact Ray Levinson of USPS at 650-635-3292 or rlevinso@email.usps.gov, or Bill Golove of LBNL at 510-486-5229 or whgolove@lbl.gov.

Obtaining Biodiesel Now Easier Than Ever for Federal Fleets

A recent solicitation by the Defense Energy Support Center (DESC) will soon make biodiesel available at Federal sites throughout the country. The move allows Federal fleets to obtain biodiesel just as easily as petroleum diesel through DESC services.

Among the Federal biodiesel users taking part in the program are the National Park Service; the U.S. Postal Service in Manhattan, New York; the Department of Agriculture; the National Arboretum; the National Aeronautics and Space Administration; Camp Lejeune Marine Corps Base in North Carolina, and Miramar Marine Corps Air Station in California. The U.S. military services will use biodiesel in commercial administrative vehicles.

Under the solicitation, DESC will procure approximately 1.5 million gallons of B20 (20 percent biodiesel/80 percent diesel). Both military and civilian fleets will be able to obtain B20 at various fueling sites throughout the country. (See page 12.) By using DESC to buy the fuel, all Federal agencies are able to streamline their acquisition process by simply placing orders against the DESC contract with World Energy Alternatives of Cambridge, Massachusetts.

“This is the largest single procurement of biodiesel to date,” said Joe Jobe, Executive Director of the National Biodiesel Board. “It is symbolic of the growing interest in using biodiesel in Federal and civilian fleets. It also shows that the Federal government has confidence in this thoroughly-tested fuel that has become one of the fastest-growing alternative fuels according to the Department of Energy.”

Biodiesel can be used in any diesel engine, usually with no modifications to the engine necessary. It performs comparably to diesel fuel, with similar cetane and Btu content and it offers excellent lubricity and lower emissions compared to petroleum diesel fuel. More than 100 major fleets currently use biodiesel. Biodiesel can be used to meet alternative fuel vehicle (AFV) purchase requirements of the Energy Policy Act (EPA Act) as well as the goals of three Executive Orders, including the renewable energy goal in Executive Order 13123.

One agency using biodiesel to earn AFV credits is the Department of Agriculture’s Agricultural Research Service in Beltsville, Maryland. “We use B20 in more than 150 diesel engines that range from farm tractors to large generators to trucks, including one bus and even one humvee,” said John Van de Vaarst, Director of Facilities Management and Operations. “We find biodiesel to be as

reliable and dependable as regular diesel fuel, and it’s so easy to make the switch,” he said.

Biodiesel is registered with the Environmental Protection Agency (EPA) as a fuel and fuel additive. Biodiesel reduces carcinogenic air toxics by 75 to 90 percent compared to diesel and biodiesel is non-toxic, biodegradable, and free of sulfur. Emissions it reduces include particulate matter, unburned hydrocarbons, carbon monoxide, and sulfates. B100 (pure biodiesel) also reduces life-cycle carbon dioxide by 78 percent compared to petroleum diesel according to DOE research.

For more information on the DESC biodiesel solicitation, please see www.desc.dla.mil/DCM/DCMPage.asp?LinkID=DESCPEHome. For information on biodiesel, please see the DOE Office of Transportation Technologies’ Alternative Fuels Data Center web site at www.afdc.doe.gov/altfuel/biodiesel.html or the National Biodiesel Board’s web site at www.biodiesel.org.

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Exhibitors, call 410-997-0763 or e-mail energy@epponline.com.

Biodiesel Fueling Sites

State	City	Agency	Address	Contact/Phone
Arizona	Yuma	U.S. Marine Corps	Air Station Yuma, S4 Supply Officer Box 99123 Yuma, AZ 85369-9133	Sharon Robinson 520-269-2478
California	Miramar	U.S. Marine Corps	Marine Corps Air Station – Miramar San Diego, CA 92145-2008	Fuel Office 858-577-1396
California	San Francisco	U.S. Postal Service	San Francisco Government Maintenance Facility 1300 Evans Avenue San Francisco, CA 94124	C. Simmons 415-550-5213
Georgia	Albany	U.S. Marine Corps	Albany Marine Corps Logistics Base, Fleet Support Center Code 856-3, 814 Radford Boulevard Albany, GA 31704	G. McKinney 229-639-5813 mckinneylg@malcom.usmc.mil
Illinois	Chicago	U.S. Postal Service	Central Garage 741 South Clinton Street Chicago, IL 60607-4300	Teresa Gill 312-983-8720
Illinois	Chicago	U.S. Postal Service	Higgins Auxiliary 6020 Higgins Road Chicago, IL 60630-1928	Teresa Gill 312-983-8720
Illinois	Chicago	U.S. Postal Service	Processing and Distribution Center 11560 Irving Park Road Chicago, IL 60701-2000	Teresa Gill 312-983-8720
Maryland	Beltsville	Department of Agriculture	Beltsville Agricultural Research Center 10300 Baltimore Boulevard, Room 124 Beltsville, MD, 20705-0000	Christian Obineme 301-504-6005
Maryland	Cambridge	Interior Department	Cambridge Blackwater National Wildlife Refuge Fish & Wildlife Service 4521 Key Wallace Drive Cambridge, Maryland 21613	John Johnson 410-228-5889 john_h_johnson@fws.gov
Maryland	Greenbelt	Interior Department	National Park Service, Greenbelt Park 6565 Greenbelt Road Greenbelt, MD 20770	James Warfield 202-426-0908
Maryland	Suitland	Interior Department	National Park Service Suitland Parkway (Route 4) Suitland, MD 20746	James Warfield 202-426-0908
Missouri	St. Louis	U.S. Postal Service	St. Louis Vehicle Maintenance Facility 1725 Clark Avenue St. Louis, MI 48880-9415	314-436-4392
New York	Manhattan	U.S. Postal Service	Manhattan Vehicle & Maintenance Facility 201 11 th Avenue Manhattan, NY 10001-1221	J. Raguso 212-330-4902 Delores Penix 212-330-4809
North Carolina	Camp Lejeune	U.S. Postal Service	Marine Corps Base Camp Lejeune, NC 28547-2539	Customer Service 910-394-2821/2628
Virginia	Hampton	National Aeronautics & Space Admin.	Langley Research Center Junction I-64 & 134 Hampton, VA 23681-2199	Suzanne Melson 757-864-3571
Virginia	Manassas	Interior Department	National Park Service, Manassas National Battlefield Park 6750 Sudley Road (Route 234) Manassas, VA 20109-2354	Jim Thompson 703-361-7996 jim_thompson@nps.gov
West Virginia	Harpers Ferry	Interior Department	National Park Service Fillmore Street Harpers Ferry, WV 25425	D. Ebersole, 304-535-6002 K. Starnes, 304-535-6039

continued on next page

Fast Track Your CHP Project With FEMP's Screening Assistance

For some facilities, combined heat and power (CHP) technology (also known as building cooling, heat, and power; or cogeneration) can offer big improvements in energy efficiency. CHP technology can reduce the costs of government, increase energy security, and improve air quality. How can you tell if CHP is right for your facility? To make advanced CHP technologies more accessible to Federal agencies, FEMP is offering free screenings to Federal facility managers. The screenings are offered under FEMP's program for accelerated development and deployment of CHP—and are based on basic data provided by interested sites. FEMP produces a summary report that helps managers understand factors affecting their CHP economics and decide whether to take the next steps toward a CHP project.

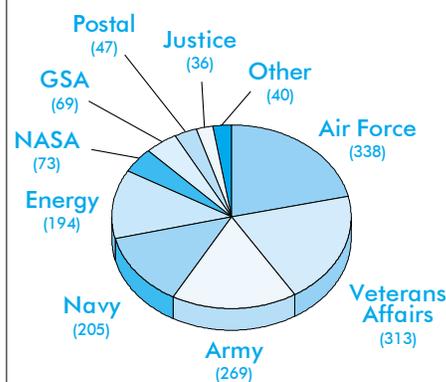
Federal sites that appear to have potential after the first screening will have the opportunity to assemble additional site-specific data, which can support a higher level of CHP analysis. Sites are encouraged to partner with private

sources of technical and financial assistance. Many options are available to sites with interest and strong potential for CHP. The CHP approach may offer an opportunity to make distributed generation systems more efficient and cost-effective at many sites. (See accompanying pie chart for the estimated potential CHP capacity in the Federal sector.)

Once partners begin developing proposals for CHP projects, FEMP can provide additional support with proposal and design reviews, fair and reasonable price determinations, and other assistance. These services can help agencies interested in CHP avoid common pitfalls, reduce project development costs, and make more informed decisions.

For more information about FEMP technical support for CHP, please contact your Regional FEMP Manager (see list of DOE Regional Offices on contacts page of FEMP Focus). To request a free screening, contact Linda Stansberry of ORNL at 865-574-0266 at stansberry@ornl.gov.

Estimated Potential CHP Capacity (megawatts) in Federal Sector with Simple Payback Under 10 Years, by Agency*



Source: "Analysis of CHP Potential at Federal Sites" ORNL/TM-2001/280. February 2002.

* This CHP market assessment, based on total building stock, average energy costs, and energy intensities, shows a few larger Federal agencies with significant potential in buildings with high thermal loads (e.g., R&D, hospitals). Actual CHP potential depends on site-specific factors including mission requirements for energy security and existing equipment. All agencies may have significant opportunities for CHP to help them meet energy conservation and emission reduction goals.

BIODIESEL FUELING SITES

(continued from previous page)

State	City	Agency	Address	Contact/Phone
Washington, D.C.		Agriculture Department	National Arboretum, Agricultural Research Service 3501 New York Avenue, NE Washington, DC 20002-1958	Christian Obineme 301-504-6005/5474
Washington, D.C.		Interior Department	National Park Service Fort DuPont Park 2501 Champlain Street, NW Washington, DC 20009	James Warfield 202-426-0908
Washington, D.C.		Interior Department	National Park Service Anacostia Park/Kenilworth Park/Kenilworth Aquatic Gardens, Kenilworth Avenue Washington, DC 20019	James Warfield 202-426-0908
Washington, D.C.		Interior Department	National Park Service Rock Creek Park, Military Road Washington, DC 20015	Daniel Hodgson 202-426-6953

NREL Designs DER Modeling Tool

Developed by DOE's National Renewable Energy Laboratory (NREL), the Hybrid Optimization Model for Electric Renewables (HOMER) is a computer model that simulates and optimizes distributed energy resource (DER) systems. Whether you are designing a DER system for a Federal facility, investigating the cost of powering an off-grid building, or researching the potential of renewable energy for an agency project, HOMER can be a powerful tool. Its speed and simplicity allows users to perform sophisticated analyses with ease, and provides insight into the complex nature of hybrid power system design.

HOMER is designed to overcome challenges created by the wide variety of possible power system configurations, the intermittent nature of renewable energy sources, the limited availability of renewable resource data, and uncertainty in load, resource, and cost inputs. It quickly performs hourly simulations of thousands of possible system configurations accounting for the seasonal and variable nature of loads and resources. HOMER ranks the solutions by net present cost, which clearly identifies the system with the least life-cycle cost. Built-in resource data can be used when hourly data is unavailable. HOMER's sensitivity analyses demonstrate the effects of changes in the inputs.

HOMER isn't just for modeling renewable energy DER options. HOMER can model any combination of wind turbines, solar photovoltaic (PV) panels, run-of-river hydroelectric, small modular biomass, conventional generators using diesel, propane, or gasoline, and battery storage systems.

HOMER has over 1,500 users in 110 countries. NREL's FEMP team has used the current version for several off-grid National Park projects: Canyonlands and Natural Bridges in Utah, Pinnacles and Alcatraz in California, and Assateague in Maryland.

Inputs

To design the optimal hybrid system, HOMER needs to know about the expected electrical demand, local energy costs, the available renewable energy resources, and the cost and performance of the various components. HOMER divides inputs into four categories:

- load inputs—the system's electrical and thermal loads,
- resource inputs—the available renewable energy resources (using monthly or hourly data) and the price and characteristics of fossil fuels,
- component inputs—the cost and performance of the power system components, and
- optimization inputs—the allowable size range for each system component and various constraints on the power system.

HOMER also considers the local cost of fuel and the cost of grid extensions when evaluating options. Multiple values can be specified for most variables when the data is uncertain or the user is interested in a potentially wide range of applications. HOMER performs its optimization procedure for each sensitivity case, or combination of values.

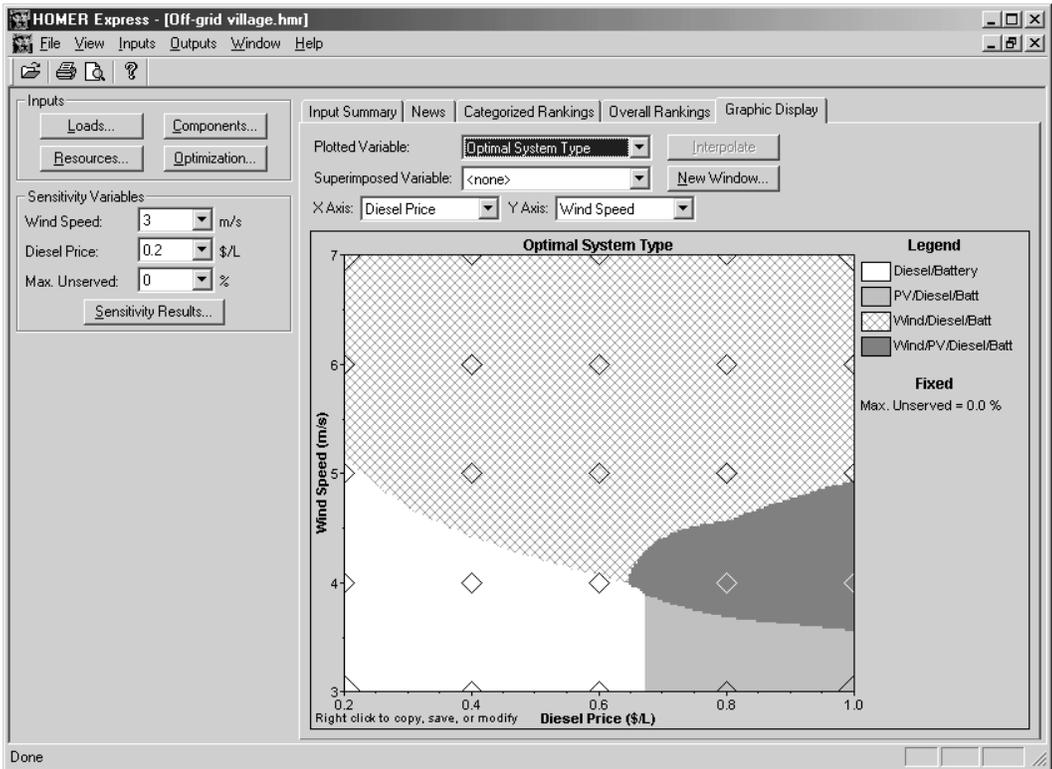
Outputs

HOMER provides three levels of outputs. The results of a particular system simulation include:

- summary results like capital cost, net present cost, annual energy production, and fuel usage, as well as hourly data like power production or battery state of charge;
- optimization results, which rank all of the different systems simulated for a particular sensitivity case according to net present cost; and
- sensitivity outputs that show the effects of changes in sensitivity variables, in tabular or graphic format.

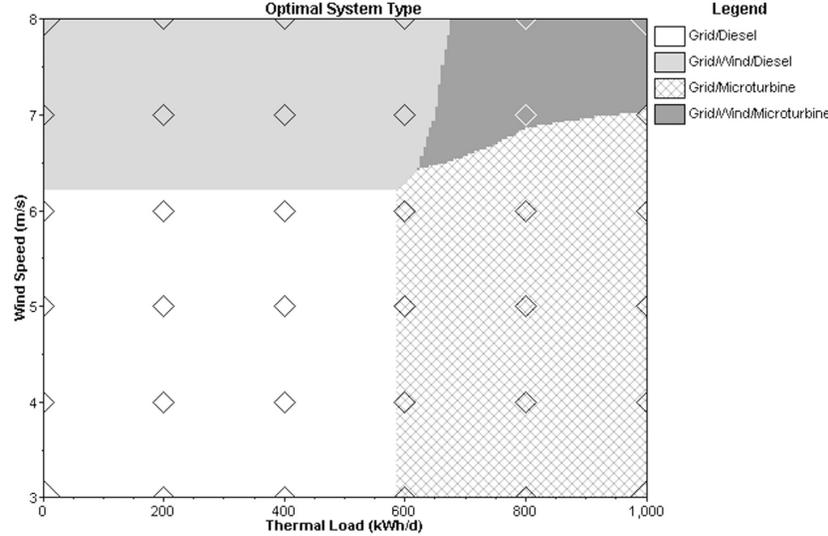
The next generation of HOMER, currently undergoing beta testing and scheduled for release in fall 2002, will be able to analyze grid-connected DER applications, including combined heat and power (cogeneration) systems. The range of technologies will also be broadened to include fuel cells, microturbines, and biogasification systems. A pre-release version is currently being tested.

For more information about HOMER, or to download a free copy, please see www.nrel.gov/international/tools/homer/homer.html. A simplified web-based version of HOMER is available at <http://analysis2.nrel.gov/homer/login.asp>. Comments, questions, and requests for training can be directed to Peter Lilienthal of NREL at peter_lilienthal@nrel.gov.



In Figure 1, an example of a sensitivity output, the optimal system type is shown as a function of diesel fuel price and wind speed. Wind power is competitive at the higher wind speeds, although the critical wind speed is dependent on the fuel price. PV is competitive only at low wind speeds and high fuel prices.

Figure 2 shows the results of an analysis considering wind turbines, diesel generators, and natural gas-fueled microturbines for an institutional user of electrical and thermal energy. Microturbines have higher capital cost and slightly lower electrical efficiency than diesel generators, but their waste heat is easily captured for use in industrial processes. The graph shows that microturbines are preferable to diesels if there is sufficient thermal load, and that wind turbines make sense at sufficiently high wind speeds.



Super ESPC Promises Energy Savings with Biomass and Alternative Sources of Methane

Recently, DOE awarded technology-specific Super Energy Savings Performance Contracts (ESPCs) to five energy service companies (ESCOs) to reduce energy use, manage utility costs, and promote renewable energy at Federal facilities by using biomass and alternative sources of methane. “In his National Energy Plan, President Bush directed the Federal government, the nation’s largest energy consumer, to lead by example,” Secretary of Energy Spencer Abraham said in announcing the new contracts. He added that these contracts “encourage innovative bio-based energy technologies to reduce Federal energy consumption, without cost to the American taxpayers. Our goal is to make bioenergy cost-competitive with traditional energy sources.”

The ESCOs selected for the Super ESPC program for biomass and alternative sources of methane are:

- Constellation Energy Source, Baltimore, Maryland;
- DTE Biomass Energy, Inc., Ann Arbor, Michigan;
- Energy Systems Group, Evansville, Indiana;
- Systems Engineering and Management Corporation, Knoxville, Tennessee; and
- Trigen Development Corporation, Baltimore, Maryland.

Biomass includes dedicated energy crops and trees, agricultural crop residues, aquatic plants, wood and wood residues, animal wastes, and other organic waste materials. Alternative sources of methane include landfills, wastewater treatment plants, and coalbeds.

Working with FEMP, these companies will develop, finance, and implement projects that guarantee energy-related cost savings at Federal facilities by using biomass and alternative methane fuels. In return, the companies receive fixed payments derived from the energy cost savings achieved. Since the capital investment comes from the private sector, the projects do not require Federal appropriations. The projects performed under these contracts can be at any Federal site throughout the world. The total awarded value of these contracts is estimated to be up to \$200 million, with energy-related cost savings in excess of that amount.

Although biomass and alternative methane fuel applications such as steam and on-site power generation will be integral to each project, a variety of other conservation measures such as retrofits to lighting, motors, and HVAC systems may be included to further reduce energy costs.

This ESPC supports the goals of two Executive Orders:

- Executive Order 13123, “Efficient Energy Management,” which requires Federal agencies to reduce energy use in Federal buildings by 35 percent from 1985 levels by 2010.
- Executive Order 13134, “Developing and Promoting Bio-based Products and Bioenergy,” which seeks to stimulate the creation and early adoption of technologies needed to make bioenergy cost-competitive in large markets.

The biomass and alternative methane fuels Super ESPC also supports the National Energy Plan by increasing energy supplies, promoting energy security, and improving the environment. The National Energy Technology Laboratory, under the direction of FEMP, is conducting a market assessment to identify Federal facilities that are in close proximity to potential biomass and alternative methane sources.

FEMP has issued three other technology-specific Super ESPCs to help Federal facilities adopt specific emerging technologies. These Super ESPCs focus on solar thermal concentrating systems (high temperature solar devices that generate electricity or provide heat used in boilers and laundries), photovoltaics, and geothermal heat pump systems. Technology-specific Super ESPCs give Federal agencies access to new or emerging technologies that have outstanding potential for saving energy and money at Federal sites.

For more information on the biomass and alternative methane fuels Super ESPC, please contact Steve Cooke of the National Energy Technology Laboratory at 304-285-5437 or steve.cooke@netl.doe.gov, or Danette Delmastro of FEMP at 202-586-7632 or danette.delmastro@ee.doe.gov. Also see FEMP’s web site at www.eren.doe.gov/femp/financing/espcc/biomass.html.

ESPCs Stretch Budgets at the Bureau of Indian Affairs

The Interior Department's Bureau of Indian Affairs (BIA) has reduced energy costs, replaced inefficient lighting and aging building equipment, and installed renewable energy systems without huge increases in the BIA budget. The agency is accomplishing this at BIA schools and facilities with a Super Energy Savings Performance Contract (ESPC).

BIA's first four regional Super ESPC projects alone represent \$12 million in infrastructure improvements that will reduce energy use more than 40 percent at four BIA sites. Sherman Indian High School in Riverside, California, is one good example. This project features several energy-efficient technologies, improves the facility's infrastructure, and includes a solar electric system to help provide uninterrupted power. The project will reduce energy use by almost 40 percent at the school and trim operations and maintenance (O&M) costs by nearly \$30,000 per year.

Alternative Financing Enables Facility Upgrades

In 1997, BIA energy manager Bill Coursey began discussions with staff in the DOE Western Regional Office in Seattle. He wanted to know if ESPCs would be a solution to a major backlog in infrastructure repairs and equipment maintenance at BIA facilities. Working jointly, they determined that ESPCs could help BIA reduce the backlog, maintain or improve the comfort of its facilities, and reduce utility costs. Among other projects, a delivery order under the Western Regional Super ESPC was

signed in 2000 for work needed at the Sherman Indian High School in Riverside.

Sherman Indian High School dates back to the early 1900s. Located on 88 acres, this boarding school serves from 350 to 650 students in approximately 500,000 square feet of facility space. Before the Super ESPC retrofits, annual energy and water use at the facility was estimated at 3,756 megawatthours of electricity, 140,743 therms of natural gas, and 36,818 cubic feet of water. Utility costs exceeded \$450,000 per year.

SEMPRA Energy Solutions was selected as the energy service company for the

Sherman Indian High School project under the Regional Super ESPC. SEMPRAs agreed to install a new photovoltaic (PV) solar electric system as part of the project. The PV system had already been purchased with DOE funding, but it had not been installed because of budget constraints. Under the 22-year contract, SEMPRAs guarantees the following:

- **Lighting retrofits and additional exterior lighting.** High-efficiency electronic ballasts and T8 fluorescent lamps replaced all T12 fluorescent lamps and magnetic ballasts; LED

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This photovoltaic energy system is expected to provide nearly 7 kilowatts of clean solar electricity to the Sherman Indian High School campus.

Your Alternative Financing Questions Answered

What are the desired outcomes of the kick-off meeting? Are the decisions made at the meeting final?

During the kick-off meeting, the agency and the energy service company (ESCO) meet and exchange information to help prepare the ESCO for its preliminary site survey. A kick-off meeting clarifies expectations, establishes communications protocols, and develops a schedule for agency and ESCO tasks through the award of the delivery order. The agency uses the kick-off meeting to make sure that the ESCO has a clear understanding of the agency's priorities and general parameters for the project. Final decisions and complete agreement are not necessary or expected at this stage. But general guidelines can be established concerning which buildings or sites are to be targeted, problems that need to be fixed, potential energy conservation measures (ECMs), measurement and verification (M&V) guidelines, payback ranges, project timelines, and length of contract term.

Does every agency and facility need to engage in a competitive process to choose a contractor?

Once an agency identifies a project it can obtain a performance contract through either sole source or open competition. If the agency chooses the sole source route, the ESCO must have either a special capability or unique understating of the project, which makes them especially qualified to perform the work. A sole source award is usually made for a specific technology, a proprietary technology, or if the ESCO has a prior history working on the site or similar sites. A competitive process for choosing an ESCO is used when an ESCO does not have an advantage at a particular site.

What is the contracting authority?

All Federal agencies that have government-owned facilities have the authority to enter into energy savings performance contracts (ESPCs) by virtue of the authorizing legislation: P.L. 102-486, Energy Policy Act of 1992, codified as 42 USC 8287 of the National Energy Conservation Policy Act for civilian agencies. DOD authorizing language is found in 10 USC 2865, Energy Savings at Military Installations. DOE and DOD have created regional Super ESPC mechanisms with dollar limits.

What questions do you need answered? FEMP wants to provide the most useful information possible, but we need your help to achieve this! Please submit your questions via e-mail to Tatiana Strajnic of FEMP at tatiana.strajnic@ee.doe.gov.

ESPCS STRETCH BUDGETS AT THE BUREAU OF INDIAN AFFAIRS

(continued from page 17)

signs replaced all incandescent exit signs. Occupancy sensors were installed in selected classroom and office areas, and exterior low-pressure sodium fixtures were replaced with metal halide lamps.

- **Installation of a 6.9-kilowatt PV system.** The system includes PV modules, inverters, storage batteries, and programming to maximize output during peak energy-use periods. Training in PV system design and installation was provided for 15 local participants.
- **HVAC modifications in administrative and classroom buildings and one dormitory.** Ten 30-year-old, multi-zone rooftop units were replaced with high-efficiency, single-zone units that allow true variable-air-volume system control, including economizer cycling. A boiler and hot water system in one dormitory was replaced with a gas-fired, forced-air HVAC system to allow heating and split-coil cooling.
- **Time clock controls for the weight room, HVAC, and waterwell pump.** Time clocks were added to ventilation fans and HVAC units for the weight room to reduce operating hours and limit operation of the waterwell pump to off-peak periods.
- **Pool cover and ventilation controls.** A new automatic pool cover and humidity ventilation control system is reducing excess humidity and heat loss during unoccupied periods.
- **Pool pump control.** An adjustable speed drive was installed with a flow meter to control the pool filtration system and reduce flow during unoccupied periods.

These energy conservation measures (ECMs) provide new heating and cooling controls and greater energy efficiency at the site. New air-handling units give staff more time to maintain other systems around the campus. And a new computer station in one science classroom monitors the performance and output of the PV system, providing a basis for new curriculum materials.

The BIA maintains O&M activities for all the ECMs. SEMPRA is responsible for ensuring that all annual maintenance activities are carried out and for guaranteeing the performance of the rooftop units.

For more information, please contact Tatiana Strajnic of FEMP at 202-586-9230 or tatiana.strajnic@ee.doe.gov.

DOE's Pantex Plant ESPC to Save More Than \$10 Million in Energy Costs

DOE's Pantex Plant in Amarillo, Texas, will save approximately \$10.4 million in energy-related costs over the next 18 years, thanks to a delivery order under DOE's Central Region Super Energy Savings Performance Contract (ESPC). The Pantex Plant Super ESPC delivery order is the largest to-date for a DOE facility.

Plant staff and energy service company personnel have teamed up with experts at FEMP to save energy and water, use solar technologies, enhance the plant's ability to manage production, and save taxpayer dollars. Although electricity and natural gas prices in west Texas have been relatively low, the first delivery order at Pantex will still save about \$480,000 annually in energy bills and operation and maintenance (O&M) costs. New energy conservation measures and technologies installed under the delivery order should reduce energy bills at the plant by about 15 percent.

The crown jewel of these new technologies is the new energy management control system (EMCS). Although the EMCS does not have the shortest payback period, it will make the greatest contribution to the facility's overall energy efficiency. It will allow DOE and NORESOCO LLC, an energy service company for the Central Region Super ESPC, to constantly monitor energy usage on a real-time basis. This capability allowed both parties to agree to an aggressive measurement and verification (M&V) protocol based on accumulated run-time data and actual weather conditions.

NORESOCO is also upgrading the lighting; consolidating and centralizing a distributed chilled water and steam distribution system; replacing rooftop HVAC units; and installing a solar domestic water heating system, water heater resets, controls for preheat coils, and an ozone laundry system.

Through Super ESPC projects like this, DOE can implement innovative but proven technologies and conservation measures to solve problems caused by old, inefficient plant equipment. Super ESPCs also foster strong partnerships with the private sector.

In recent years, the DOE Pantex Plant nuclear weapons assembly and disassembly facility had been struggling to maintain an energy management system installed in the early

1980s. Replacement or expansion parts were not available, and the plant's process control capability was lost. Many energy-consuming systems were in manual-control mode, operating 24 hours a day. Chiller plants using R-11 refrigerant were at the end of their useful life. Several smaller chillers had been installed for specific loads or small stand-alone buildings rather than connected to a nearby, capacity-constrained loop chiller system.

Several thousand feet of the main steam distribution line had to be energized in the summer to provide hot water to rest rooms and shower facilities. Rooftop HVAC systems required an excessive amount of maintenance and repairs. With these conditions as a starting point, NORESOCO proposed measures that would improve operations and reduce energy use.

The Pantex Plant's energy management team worked closely with NORESOCO to evaluate measures that could save energy and water. After undertaking a thorough cost/benefit analysis, DOE and NORESOCO selected nine energy conservation measures (ECMs) for the first delivery order. Two of the nine ECMs, the EMCS and the chiller water/steam piping system, required about 73 percent of the total investment cost and will contribute about 80 percent of the total savings.

The EMCS controls 54 large air-handling units in 26 buildings and optimizes the use of the economizer cycle, turns off the blower fan during non-working periods, and uses variable-volume controls when the facility is occupied. The system also monitors the performance of other conservation measures. NORESOCO engineered the EMCS to allow for future expansion and process control.

NORESOCO is providing complete O&M support to the EMCS for the first 36 months to maintain equipment and sensors and train in-house staff. To ensure real-time data monitoring and reporting, NORESOCO will use the communications feature of the EMCS to remotely monitor equipment performance and savings. The EMCS logs will also be the basis for M&V and reports of annual savings.

The improved chiller water/steam piping disconnects small loads from eight stand-alone chillers and connects them to the

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Bolstering Energy Awareness on Earth Day 2002



2002 Earth Day Poster

To obtain your color copy of this earth day poster call 1-800-363-EREC or visit www.eren.doe.gov/femp/ordermaterials.html.

As tens of thousands of Earth Day activities get underway around the nation on April 22, 2002 and throughout the month, DOE sites across the country are joining in the festivities by coordinating events, exhibits, and community fairs. DOE Earth Day activities are highlighting energy awareness and the importance of energy resources, efficiency in energy use, and the role of energy conservation for the creation of a healthy future for our planet.

Several exhibits demonstrating Department programs will be on display in the lobby of DOE Headquarters Forrestal Building, including an exhibit organized by FEMP. Among the materials that FEMP will be distributing will be an Earth Day poster, with the theme “Red, White, Blue . . . and Green.” The FEMP poster’s tag line is “Show your true colors this Earth Day. Use Renewable Energy for a Secure America.” FEMP is distributing posters and other energy awareness materials to Federal agencies and State and local governments holding Earth Day fairs and events.

The FEMP Earth Day poster can be ordered through DOE’s Energy Efficiency and Renewable Energy Clearinghouse at 800-363-3732. For more information, please contact Annie Haskins of FEMP at 202-586-4536 or annie.haskins@ee.doe.gov.

DOE’S PANTEX PLANT ESPC TO SAVE MORE THAN \$10 MILLION IN ENERGY COSTS

(continued from page 19)

existing chiller loop. A variable frequency drive pump operates the central chiller loop. Gas-fired water heaters provide the summer load, allowing a major portion of the steam distribution system to be shut down.

The Pantex Plant provided funding for security escorts and in-house project management. FEMP provided project facilitation support and an on-site delivery order overview to acquaint the project management team with the unique requirements of a Super ESPC.

DOE’s Pantex Plant is successfully using the Super ESPC process to replace old, inefficient equipment without increasing annual energy and O&M costs. Because NORESKO had access to demand-side management incentives from Southwestern

Public Service Company, an extra \$290,000 in funding can be applied to the project. The new EMCS allows the plant to have automated controls for its industrial process. The new energy-efficient equipment and enhanced operating procedures improve productivity while allowing Pantex to reallocate O&M staff to other essential projects.

Pantex Plant staff and NORESKO have developed an excellent working relationship, and a second Super ESPC delivery order is planned for other areas of the facility. NORESKO and DOE have identified approximately \$15 million to \$20 million in efficiency improvements that could generate more than \$1 million per year in additional energy and related savings.

For more information, please contact Tatiana Strajnic of FEMP at 202-586-9230 or tatiana.strajnic@ee.doe.gov.

Reflective Roofing Systems Save Energy at Federal Facilities

California's Edwards Air Force Base and San Diego Naval Base Marine Barracks are taking advantage of reflective roofing systems. The new roofing systems, which have been installed on existing facility buildings, serve to waterproof, insulate, and keep low-slope roof surfaces cool. Energy savings is achieved through the innovative use of technology to coat a roof with a durable, new surface. The high level of infrared emittance of the new surface, in combination with its high solar reflectance, can reduce peak surface temperatures by more than 35 percent. Depending on the level of conventional insulation in the roof, decreases in the heat flow through the roof can be equally dramatic.

The coating exceeds the requirements of the ENERGY STAR® roof products program and provides a low-slope roof with initial high solar reflectance (81 percent). For products suitable for both low-slope and steep-slope applications, the ENERGY STAR® roof products program requires initial solar reflectance greater than 65 percent. (See www.energystar.gov/products/, then click on "Roof Products.")

By using this system, the U.S. Army Corps of Engineers, who is responsible for the maintenance of the facilities at the San Diego Naval Base, has qualified for an energy rebate from the State of California. The rebate was earned from California's Energy Initiative Rebate Program for the reduction in energy consumption that is expected as a result of the application.

On new roofs, a sprayed-on polyurethane foam (SPF) base provides insulation, structure, and contour for drainage. However, unprotected polyurethane foam, even when covered with a gravel topcoat, will deteriorate due to ultraviolet light. It is also prone to water damage, erosion, drying, cracking, and attack by birds. When used alone, SPF requires frequent maintenance, re-sealing, and cleaning.

The application of polyurea permanently seals the SPF base with a seamless, flexible, extremely tough membrane with excellent water and chemical resistance. TOTALSHIELD™ polyurea, for instance, has the additional advantage that it can be applied to vertical as well as horizontal surfaces with equal effectiveness.

A final topcoat of a highly reflective coating with small hollow borosilicate spheres provides a sealed, bonded surface with high solar and ultraviolet reflectance and high infrared emittance. It

protects both the polyurethane foam and the polyurea from solar and ultraviolet damage. The National Aeronautics and Space Administration developed the hollow borosilicate spheres for use in the thick insulating tiles that protect the space shuttle upon re-entry into the atmosphere. Use of these spheres in reflective roof coatings is an example of the transfer of space technologies to the benefit of the general public.

At Edwards Air Force Base and San Diego Naval Base, the roofing system was first encapsulated through the application of a primary coat of polyurea. This precludes the need to remove hazardous materials, including asbestos, while conforming to all Federal, State, and local environmental and code requirements. An additional advantage is that the lightweight polyurea does not require additional structural members to support the retrofit system like some ballasted systems. As in new roof applications, a final reflective topcoat containing the borosilicate spheres provides a permanently sealed, highly reflective surface for protection against ultraviolet degradation and for enhanced energy efficiency.

EERS International, Inc. of Fort Lauderdale, Florida, supplied the polyurea and the highly reflective topcoat containing the borosilicate spheres to the Edwards Air Force Base and San Diego Naval Base Marine Barracks. The reflective coating is a patented product marketed under the name CERAMICOAT. EERS International, Inc. is a partner in the ENERGY STAR® program.

When the energy savings from application of the systems are factored into the projected life-cycle costs for installation, operation, maintenance, and repair of the systems, the roofing systems pay for themselves in as few as 3 years. The life-cycle analysis shows that the benefits of these systems include:

- class "A" roof fire protection as defined by ASTM E-108,
- highly energy-efficient roof,
- lower installation cost than other commonly used roofing systems,
- minimal maintenance costs, and
- a projected 3 to 5 year payback of investment through energy savings alone.

For more information, please contact Tom Petrie of ORNL at petrietw@ornl.gov or see FEMP's Buying Energy Efficient Products web site at www.eren.doe.gov/femp/procurement/roof.html.

NEW TECHNOLOGY DEMONSTRATION PROGRAM

New Technology Demonstration Program Success Story

*Give a man a fish, and you feed him for a day.
Teach a man to fish, and you feed him for a lifetime. —ancient proverb*

Like many educational, outreach, and training programs, FEMP's New Technology Demonstration Program is not designed to give you the answer. It is designed to provide information so that you may make more informed decisions. This article, the third in a series on the New Technology Demonstration Program, tells the story of one Federal site and its path toward energy efficiency.

It is hard to tell where this story began and it certainly hasn't ended. We will begin in September 1995, when the New Technology Demonstration Program issued a *Federal Technology Alert* entitled "*Ground-Source Heat Pumps Applied to Commercial Facilities*."¹ Ground-source heat pump systems, also referred to as geothermal heat pumps or geoexchange systems, have been around for several decades, but their use in Federal facilities had been limited. The scope of this *Federal Technology Alert* was to show how the HVAC requirements of larger² facilities can be achieved using multiple ground-source heat pump systems.

You might think that issuing the publication might be the end of the project for the New Technology Demonstration Program. But when things go well, issuing the publication becomes the start of new activities. The back of each publication identifies general contacts for the program, as well as, technical contacts. The technical contact is usually the author of the document.

A few years after publication, the New Technology Demonstration Program received a call from the energy program manager at a U.S. Navy facility. This Federal energy program manager was seeking permission to use some of the information contained in the *Federal Technology Alert* for an article in the local base newspaper. On further inquiry, it was learned that the energy program manager was using the *Federal Technology Alert* to evaluate and assess the use of ground-source heat pumps systems at the site but was coming up against several obstacles. Normally, the New Technology Demonstration Program would have brought the request to the attention of the FEMP Design Assistance Program, one of FEMP's resources designed to assist Federal agencies with this type of request. However, in this case, the site was introduced to a government-funded technical assistance program at the International Ground-Source Heat Pump Association (IGSHPA) at Oklahoma State University.³ An IGSHPA engineering team assisted the site engineering department and contractors in overcoming technical barriers leading to an improved design with lower capital cost requirements. The site went on to install over 410 tons of ground-source heat pumps in six new and two renovated facilities, over 265,000 square feet of building space. The New Technology Demonstration Program counts this type of follow-up as a success story, but the story does not end here.

Later, the site once again contacted the New Technology Demonstration Program. The site wanted to more fully deploy the technology, but like most Federal agencies they did not have the financial resources to implement all cost-effective energy-efficiency projects. Coincidentally, FEMP was in the early stages of developing a technology-specific Super Energy Savings Performance Contract (ESPC) for ground-source heat pump systems and was looking for Federal sites interested in being included in the solicitation. The Navy site was introduced to FEMP's Alternative Financing Program, and a new partnership was formed. The technology-specific Super ESPC has since been awarded and the site is working to establish a delivery order under the DOE contract. The delivery order, when completed, is expected to include 15 more facilities covering almost 460,000 square feet, which would add another 950 tons of ground-source heat pumps. The capital cost of the delivery order is estimated to be \$7 million to \$8 million.

The site is Naval Air Station Oceana, located near Virginia Beach, Virginia, and the energy champion, Bob Harvey, was a

continued on next page

¹ This *Federal Technology Alert* was updated in March 2001 and re-titled, "*Ground-Source Heat Pumps Applied to Federal Facilities – Second Edition*."

² The term "larger" is intended to imply any building larger than single-family housing units, such as offices, schools, dormitories, and other facilities.

³ While this specific technical assistance program is no longer available, similar programs may still be available through other sources. Check the FEMP web site at www.eren.doe.gov/femp/.

NEW TECHNOLOGY DEMONSTRATION PROGRAM SUCCESS STORY (continued from previous page)

guest on the TeleFEMP VII satellite broadcast, which featured the site and some of its new ground-source heat pump systems. The site was also a recipient of a 1998 Federal Energy and Water Management Award. While the New Technology Demonstration Program obviously cannot take full credit for these energy-saving projects, we know that the program played a significant role in its early stages.

The *Federal Technology Alert* on “Ground-Source Heat Pumps Applied to Commercial Facilities” is one of the program’s more popular publications. It has been used as supplemental material in training workshops sponsored by the IGSHPA and the Association of Energy Engineers. It was at the request of the IGSHPA that the New Technology Demonstration Program elected to update the *Federal Technology Alert* in 2001.

Do you have a success story for the New Technology Demonstration Program? If your Federal site has implemented a successful energy-saving, water-conserving, solar, or other renewable-energy project as a result of a New Technology Demonstration Program publication, we would like to hear from you. Please send us your story by e-mail to steven.parker@pnl.gov and theodore.collins@ee.doe.gov.

For more information, please contact Steven Parker of PNNL at steven.parker@pnl.gov or Ted Collins of FEMP at theodore.collins@ee.doe.gov. See the geothermal heat pump (GHP) pages on FEMP’s web site for more information at www.eren.doe.gov/femp/financing/esp/geo/thermal_heat_pumps.html. For information about the DOE Technology-Specific GHP Super ESPC, please contact Doug Culbreth of DOE’s Atlanta Regional Office at 919-782-5238 or carson.culbreth@ee.doe.gov.

Improvements to FEMP’s New Technology Demonstration Program Web Site

The FEMP New Technology Demonstration Program web site at www.eren.doe.gov/femp/prodtech/newtechdemo.html, located under “Products, Technologies, and Success Stories” on the main FEMP web page, was updated recently with the following improvements:

- **Creation of a Technology Index Table** – This table includes links to each New Technology Demonstration Program publication available through the FEMP web site (in HTML and PDF). It provides a convenient way to view and download over 45 publications that have been created to date by the program at www.eren.doe.gov/femp/prodtech/index_technologies.html.
- **FTA Section “Streamlined”** – The *Federal Technology Alert* (FTA) section was shortened to provide a brief descriptive paragraph for each FTA. Each paragraph contains links to the appropriate FTA at www.eren.doe.gov/femp/prodtech/fed_techalert.html (in HTML and PDF). As of March 2002, there were 19 FTAs available to view and/or download.
- **Latest Demonstration Reports Posted** – Two new reports have been added based on technology demonstrations of multi-layer light polarizing panels and full-spectrum polarizing lighting at www.eren.doe.gov/femp/prodtech/tech_d.html (in PDF).
- **Technology Installation Reviews and Technology Focus Sections Updated** – These two sections of the New Technology Demonstration Program web site were updated to reflect the latest published *Technology Installation Reviews* available at www.eren.doe.gov/femp/prodtech/tech_install.html and the latest published *Technology Focuses* available at www.eren.doe.gov/femp/prodtech/tech_focus.html (in HTML and PDF).
- **Direct Mailing List** – This section allows you to sign up at www.eren.doe.gov/femp/prodtech/ntdp_mlform.html to receive copies of new program publications when they become available.
- **Technology Submittal Form** – This convenient electronic form, available at www.eren.doe.gov/femp/prodtech/ntdp_tsform.html, allows Federal agency staff to submit ideas on new and emerging technologies to the program, and gives you the opportunity to tell the program what new technologies you want to know more about.

For more information on the New Technology Demonstration Program web site, please contact Steven Parker of PNNL at steven.parker@pnl.gov, David Payson of PNNL at dave.payson@pnl.gov, or Ted Collins of FEMP at theodore.collins@ee.doe.gov.

FEMP Offers DER Project Development Workshops

FEMP is conducting a series of hands-on, project-focused Distributed Energy Resource (DER) workshops. The workshops will be held in Atlanta, Chicago, Los Angeles, and Boston over the coming year. The first workshop will be held May 23-24, 2002 in Atlanta, Georgia. The workshops will offer opportunities for Federal facility energy managers interested in applying DER technologies to meet and work with private industry representatives interested in supporting DER projects with financing and/or equipment. Other key actors for DER success including environmental regulators and utilities will also participate.

DER technologies include any decentralized energy storage and/or delivery systems located near the point of use, such as gas turbines, fuel cells, reciprocating engines, solar photovoltaic and combined heat and power (CHP) systems. The workshops will focus on

providing information, resources, and contacts that will allow participants to identify where DER technologies can be cost-effective in supporting agency missions, and to help initiate sound DER project development. At each workshop, the agenda and speakers will reflect DER issues specific to the region in which it is held.

Who should attend? Officials from Federal, regional, and State organizations involved in energy management and procurement; private- and public-sector energy and environmental organizations; and regulatory, financing, legal, and energy service organizations involved with DER are encouraged to attend. The events will be particularly relevant for any Federal representative who wants to explore DER opportunities with potential partners and experienced colleagues. The workshops will highlight new FEMP resources to support agencies in assessing DER costs, benefits, and

opportunities, such as an upcoming DER call for proposals and the screening available for CHP applications. (See article on page 13.)

Workshop topics will include the following:

- DER technologies and systems,
- DER and energy security,
- resources for developing DER projects,
- financing DER projects,
- case studies, and
- getting your DER project started.

Subsequent workshops are tentatively scheduled for June, September, and October in Chicago, Los Angeles, and Boston. For more information and to register, see www.energetics.com/femp/atlanta.html or contact Jan Brinch at jbrinch@energetics.com.

AEE and IPMVP Announce New Measurement & Verification Certification Program

The Association of Energy Engineers (AEE), in conjunction with the International Performance Measurement & Verification Protocol (IPMVP), has announced the joint implementation of the Certified Measurement & Verification Professional (CMVP) program.

The objectives of the certification program are:

- to raise the professional standards and improve the practice of those engaged in measurement & verification by encouraging professionals in a continuing education program of professional development, and
- to identify persons with acceptable knowledge and award special recognition to those professionals who have demonstrated a high level of competence and ethical fitness for measurement & verification.

Although not a prerequisite, a refresher course in the Fundamentals of Measurement & Verification will be offered at each location for two and one-half days prior to the certification examination to help energy professionals prepare for the examination.

The certification examinations will be given on:

- May 17, 2002 — Reston, Virginia
- June 5, 2002 — Anaheim, California (in conjunction with West Coast Energy Management Congress 2002)

This certification program should be considered by any professional engaged in performance contracting, energy services, or project financing. For more information about CMVP, please contact Leslie Walcker at 770-447-5083 ext. 223, or leslie@aeecenter.org or visit www.aeecenter.org/seminars.

FEMP Training Reminders

Designing Low-Energy, Sustainable Buildings

April 18-19
Golden, CO

www.sbicouncil.org
202-628-7400 ext 211

Process Heating Workshop

April 19
Houston, TX

www.oit.doe.gov/cfm/fullEvent.cfm/id=144
202-586-5885

Utility Energy Services Contracting Workshop

April 30-May 1
Pensacola, FL

www.energyworkshops.org/femp
703-243-8343

Labs 21 High Performance, Low-Energy Design Course

May 8

San Francisco, CA

www.epa.gov/labs21century/index.htm
781-674-7374

Super ESPC

May 14-15
Boston, MA

www.eren.doe.gov/femp/resources/training/fy2002_super_espc.html
703-243-8343

Implementing Renewable Energy Projects

May 20-21

Washington, DC

www.eren.doe.gov/femp/resources/training/fy2002_implement.html
303-526-5528

Distributed Energy Resources (DER) Workshop

May 23-24

Atlanta, GA

www.energetics.com/femp/atlanta.html
410-953-6277

Labs 21 High Performance, Low-Energy Design Course

June 6

Palm Springs, CA

www.epa.gov/labs21century/index.htm
781-674-7374

Life-Cycle Costing

(Combined: Basic & Project Oriented)

June 18-19

Rockville, MD

www.pnl.gov/femp
509-372-4368

Upcoming Events

Upcoming Conferences

U.S. Green Building Council Federal Summit

April 23, 2002

Washington, DC

www.usgbc.org/
215-428-9655

2002 Worldwide Energy Conference

April 29-May 3

Washington, DC

www.desc.dla.mil/default.asp
703-767-9679

National Conference on Building Commissioning

May 8-10

Chicago, IL

www.peci.org/nbc/2002/index.html
503-248-4636 ext. 201

Energy 2002

June 2-5

Palm Springs, CA

www.energy2002.ee.doe.gov/
800-395-8574

West Coast Energy Management Congress

June 6-7

Anaheim, CA

www.aeccenter.org/Shows/
770-447-5083

Solar 2002

June 15-19

Reno, NV

www.solarenergyforum.com
303-443-3130

Mid-Atlantic Sustainability Conference

June 26-29

Newark, NJ

www.nesca.org/buildings/be/nj/
413-774-6051

2002 State Energy Program Rebuild America National Conference

July 29-August 1

New Orleans, LA

www.2002conference.com
301-589-0100

Energy-Efficient Berkeley Lamp Available Now

The "Berkeley Lamp," a new high-performance table lamp recently developed by DOE's Lawrence Berkeley National Laboratory and manufactured by Light Corporation provides excellent task-ambient illumination while using less energy than conventional lighting. The new lamp's luminous output at full power is equivalent to a 300-watt halogen torchiere and a 150-watt incandescent table lamp combined, yet it uses only 25 percent of their power. The Berkeley Lamp is an energy saver in homes, and a great energy-efficient alternative in offices. This research and development project was funded by DOE's Office of Building Technology, State and Community Programs, with additional support from the California Energy Commission.



The high-performance Berkeley Lamp.

For pricing, availability, and product orders, see www.lightcorp.com or <http://lighting.lbl.gov/projects/table/table.html>. For additional information, please contact Ron Lewis of DOE's Office of Building Technology, State and Community Programs, at 202-586-8423, or Michael Siminovitch of LBNL at 510-486-5863 or mjsiminovitch@lbl.gov. Also see "Berkeley Lab Scientists Develop Energy-Efficient Alternative for Home and Office Lighting," FEMP Focus, November 2001.

FEMP Contacts

For information on topics not listed here, call the FEMP Help Desk at 1-800-363-3732.

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Atlanta Region States

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IA, IL, IN, MI, MN, MO, OH, WI

Denver Region States

CO, KS, LA, MT, NE, NM, ND, OK, SD, TX, UT, WY

Philadelphia Region States

DE, DC, MD, NJ, PA, VA, WV

Seattle Region States

AK, AZ, CA, HI, ID, NV, OR, WA, AS, GU, PW, MP

The *FEMP Focus* is published bimonthly by the Federal Energy Management Program of the U.S. Department of Energy/Office of Energy Efficiency and Renewable Energy.

If you are making projects happen at your Federal facility, FEMP would like to hear from you. Please submit project descriptions to Annie Haskins at the address listed below. You will be contacted for additional information if your project is selected to be featured in a future edition of the *FEMP Focus*.

Address mail to:

Attn: FEMP Focus
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1-800-363-3732

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