

FOCUS



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

July 2001

FEMP clients receive detailed reports covering the status of the targeted systems and recommendations for saving energy and reducing operations and maintenance costs.

OIT and FEMP Join Forces to Assist Industrial Facilities

FEMP, through its Industrial Facilities Program, now offers energy assessments and best practices advice for process loads in industrial facilities.

Executive Order (EO) 13123 defines an industrial facility as “any fixed equipment, building, or complex for production, manufacturing, or other processes that uses large amounts of capital equipment in connection with, or as part of, any process or system, and within which the majority of energy use is not devoted to the heating, cooling, lighting, ventilation, or to service the water heating energy load requirements of the facility.” EO 13123 requires industrial and other energy-intensive facilities to reduce their energy usage (relative to 1990) by 20 percent by 2005 and 25 percent by 2010. Many of these energy-intensive facilities were exempt from previous efficiency goals, but EO 13123 tightened exemption criteria.

The Industrial Facilities Program is a collaboration between FEMP and the DOE Office of Industrial Technologies (OIT) that makes the technical expertise in OIT available to Federal facilities. It offers plant-wide assessments of energy, waste, productivity, and energy analyses for targeted systems.

The plant-wide audits are offered through the OIT Industrial Assessment Centers. Each client receives a report detailing the results of a comprehensive one-day or multi-day site visit. The report includes a utility (energy, water, and waste) history and rate analysis; maps of energy, waste, and production flows; and recommendations (including engineering calculations and payback estimates) for saving energy, reducing waste, and enhancing productivity. The FEMP team also provides follow-up consultation about the site visit.

Targeted assessments of steam, compressed air, pumping, and motor systems are provided through the OIT Best Practices Assessment Teams. FEMP clients receive detailed reports covering the status of the targeted systems and recommendations for saving energy and reducing operations and maintenance costs.

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The Director's Column

As you reinvigorate your energy conservation programs in response to President Bush's directive of May 3, 2001, please know that FEMP is here to assist you with identifying and carrying out your electrical load reduction measures in your Federal facility. I hope that many of you have had an opportunity to review the June 2001 Electricity Reliability Special Issue of the *FEMP Focus* and the many actions that Federal, State, and local government agencies and businesses are taking to lessen this summer's energy problems. We want your energy projects to succeed and so we look at technical assistance in this issue.

Whether it is through design review, feasibility studies, performance measurement, or procurement evaluation, FEMP's Technical Assistance Team offers a variety of services to Federal agencies. With FEMP's collaboration with the DOE Office of Industrial Technologies and the Office of Power Technologies, Federal energy managers have even more options available. Now Federal industrial facilities can take advantage of OIT's technical expertise through FEMP's Industrial Facilities Program, which is featured in our cover article.

You can also read about FEMP's call for design assistance projects and FEMP's new process for soliciting, selecting, and implementing projects. Many excellent design assistance projects were submitted this year and a number of the selected projects are highlighted in this issue. We are also featuring an update on FEMP's SAVEnergy Program and how SAVEnergy audits can uncover opportunities to save money and energy at Federal facilities. Bringing technology assistance to Federal facilities is at the heart of FEMP's mission and the FEMP Technical Assistance Team can help Federal energy managers with comprehensive energy efficiency solutions.

This issue also includes articles on the 2001 Federal Energy Saver Showcase facilities, the GSA's successful Super ESPC project at the Richard B. Russell Federal Building, last month's Energy 2001 Workshop and Exposition, and much more.

Most of all, I wish to thank you for your outstanding work especially during this challenging season when we redouble our efforts to minimize energy shortages. By demonstrating your commitment to conserve Federal Government energy use, your efforts are making a difference.

— Beth Shearer
Director, Federal Energy Management Program

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FEMP Design Assistance Program

Focuses on Collaboration

This past year, FEMP initiated a new process for soliciting, selecting, and implementing Design Assistance Program projects. With the FY 2001 call for design assistance projects, FEMP issued a formal request for applications for the first time and selected projects based on a predetermined set of project funding criteria.

The new approach allowed FEMP staff at DOE Headquarters, the DOE Regional Offices, and the National Laboratories to be more involved in the selection process. This resulted in projects featuring a balance of energy efficiency and renewable technologies as applied to both small and large new construction and retrofits for a variety of Federal agencies.

More than 120 applications were submitted from Federal agencies all over the country as a result of the FY 2001 call for design assistance issued in September 2000. A team of experts from FEMP Headquarters, the DOE Regional Offices, and the National Laboratories selected 33 of those requests for funding.

The FEMP Design Assistance Program funds DOE National Laboratories and the Labs provide the technical assistance that agencies request for specific projects. Assistance requested for FY 2001 included:

- Feasibility assessments for various technologies,
- Life-cycle costing analyses for energy conservation measures,
- Energy-use modeling of proposed designs to evaluate impacts,

- Development of construction specifications,
- Design reviews, and
- Evaluation of renewable energy strategies.

FY 2001 applications were evaluated based on criteria that included having project champions at the site and securing wide-spread support at the requesting agency. Other selection criteria included funding a balanced portfolio of new construction, retrofits, and renewable energy projects; demonstrating the project's value and cost effectiveness; and assessing the level of cost sharing with the agency. Many projects are replicable and involve high-visibility Federal facilities, such as the ones contained in this article.

LBNL

DOE's Lawrence Berkeley National Laboratory (LBNL) is assisting the Bureau of Land Management (BLM) in the Department of the Interior. BLM has requested design assistance with ten new fire stations which combine work space with residential units in the western United States. LBNL and the BLM design team have incorporated energy-efficient measures, such as efficient lighting, heating, and cooling, into the basic design. Specifications for ENERGY STAR® appliances were also included. The energy conservation measures are estimated to save 200,000 kilowatt hours per year for the ten stations combined.

LBNL is also working with the General Services Administration (GSA) on a major new Federal building in San Francisco, California. LBNL is working

with the design team to model innovative natural ventilation strategies to refine the proposed energy-conserving strategies. If the measures are implemented, the building will be a showcase facility for natural ventilation and daylighting design.

NREL

DOE's National Renewable Energy Laboratory (NREL) is assisting the Interior Department with design and construction documents for a "green roof" installation, an expandable rooftop photovoltaic (PV) system, and rainwater/graywater collection, storage, and recycling methods for the Interior Headquarters Building in Washington, D.C. A green roof is one in which rooftop vegetation acts like a stormwater detention basin, slowing down the flow of runoff, which has become a problem for the nearby Potomac River. This is one of the first applications of a green roof in the Federal sector. NREL is also developing the conceptual design for a 10-kilowatt rooftop PV system as well as performance and cost estimates.

NREL is also assisting the National Weather Service (NWS) at Miramar Air Base in San Diego with plans and specifications for a 10-kilowatt, grid-tied PV system to power the NWS Doppler Radar Site there. At a peak rate of \$0.29 per kilowatt hour in the San Diego area, this project saves energy and is cost-effective. The design could eventually be used in more than 150 similar radar sites across the country.

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FEMP DESIGN ASSISTANCE PROGRAM FOCUSES ON COLLABORATION

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For the new, 16,000-square foot Smithsonian Astrophysical Observatory in Hilo, Hawaii, NREL has completed an energy use model to evaluate building energy efficiency measures. NREL staff identified measures that could result in energy savings of 711 million Btu per year and cost savings of more than \$43,000. NREL is also evaluating the use of solar water heating, photovoltaics for area lighting, and energy efficiency opportunities in mountaintop experiments.

2000 Presidential Award for Energy Management Success.

ORNL staff contributed their energy expertise to the design charrettes (focused, interactive brainstorming sessions) held at the Intelligent Workplace at Carnegie Mellon University, as part of the SDS approach. The charrettes applied to simultaneous projects in Yerevan, Armenia; Sofia, Bulgaria; and Abidjan, Ivory Coast. ORNL is also reviewing

include green design elements. The green design will apply to the landscaping, water use, building envelope, energy-efficient equipment, and recycled and reused products for all cabinets, flooring, ceilings, and wall coverings. PNNL is participating in weekly team meetings and working with other design and environmental engineers to develop the best possible design for the building.

Under the Department of Agriculture, the U.S. Forest Service, Sullivan Lake Office, Washington, has been experiencing high energy use in its heating and cooling system. The system is inefficient and poorly balanced. In winter, the system creates warm conditions on the roof which leads to dangerous ice jams as a result of rapid meltings. PNNL will work with Forest Service staff and an HVAC design firm to develop a solution that best addresses HVAC and building envelope issues. The Forest Service hopes to use the design recommendations as a guide for similar offices in the region.

As these sample projects show, this new method of selecting FEMP design assistance projects streamlines and optimizes the process, helping to ensure the success of the best energy-savings efforts of the Government.

Nancy Carlisle, NREL; Rick Diamond, LBNL; Michaela Martin, ORNL; and Bill Chvala, Jr., PNNL; contributed to this article. For more information on FEMP's Design Assistance Program, please contact Shawn Herrera of FEMP at 202-586-1511 or shawn.herrera@ee.doe.gov. See page 7 for details on the FEMP call for FY 2002 Technical Assistance Projects, which will have a faster project selection process.

The new approach allowed FEMP staff at DOE Headquarters, the DOE Regional Offices, and the National Laboratories to be more involved in the selection process.

ORNL

The engineering and research staff at DOE's Oak Ridge National Laboratory (ORNL) is supporting the Foreign Building Operations office (FBO) of the Department of State in the development and application of a Standard Delivery System (SDS) for future embassy construction projects. FBO is also known as "the GSA of foreign buildings." Using a broad array of new techniques, FBO can manage a large number of construction projects on highly accelerated schedules. Last year, the FBO's efforts were recognized with the

Version 1 of the SDS to improve its integrated, sustainable design approach.

PNNL

DOE's Pacific Northwest National Laboratory (PNNL) will assist the Architect of the Capitol to identify and develop energy projects in their facilities. The projects must be compatible with architectural goals of the Capitol and their Comprehensive Energy Conservation and Management Plan.

In another project, the U.S. Army Training Center at Fort Carson, Colorado, to be constructed in 2002, will

SAVEnergy Program Helps to Turn Priorities into Projects

Many agencies begin tackling the problem of how to reduce high utility bills by first determining which sites and facilities are their biggest energy consumers. The next step is usually to identify opportunities to reduce energy consumption in these facilities through cost-effective energy conservation measures (ECM). This is where the FEMP SAVEnergy Program can help. The SAVEnergy Program's direct assistance to Federal agencies helps identify and evaluate ECMs that will reduce energy and water use, to meet the requirements of current laws and Executive directives.

Halfway through this fiscal year, the SAVEnergy Program already has awarded audits for nearly 2 million square feet of Federal space. Six agencies have partnered with FEMP to uncover opportunities to save money and energy. Some of the recommendations resulting from recent audits include:

- Low-cost or no-cost operations and maintenance measures;
- Fast-payback lighting improvements;
- Heating, ventilating, and air-conditioning systems that do not use chlorofluorocarbons;
- Cost-effective renewable energy technologies; and
- Load-management devices that help agencies control energy consumption.

Many agencies are also requesting water conservation audits to determine the best methods for reducing their water use and meeting newly-established water efficiency goals.

Often, SAVEnergy audits help to launch new partnerships. An audit recently obtained by the Department of Commerce's National Oceanic and Atmospheric Administration (NOAA) at the National Marine Fisheries Service in La Jolla, California, identified a comprehensive array of cost-effective ECMs. However, like many other agencies, NOAA did not have enough appropriated funds to implement the measures. But NOAA did have the SAVEnergy audit report that indicated the project's potential for savings.



A SAVEnergy auditor inspects a unit heater at the Great Sand Dunes National Monument.

With the audit report, NOAA was able to move forward confidently with a new project partner—San Diego Gas and Electric. The utility is providing financing for the project through a utility energy service contract and FEMP is continuing to support the agency by providing a project facilitator throughout the implementation process.

SAVEnergy audits can serve as the foundation for projects with other types of alternative financing. An audit performed for the Department of Veterans Affairs (VA) Medical Center in Kerrville, Texas, identified several combinations of cost-effective ECMs. With the audit report in hand, the VA was able to start developing an energy savings performance contract (ESPC) with Johnson Controls, Inc. According to Ken Burris, a Chief Engineer with the VA, "Many of the original ideas came from the audit and the ESPC built upon them." The contract is expected to be awarded later this year. The VA also benefitted from the assistance of a project facilitator provided by FEMP.

Federal agencies with audit needs are encouraged to submit requests (see below for details). Although money is still available for audits, agencies are urged to share costs so that funding can go farther. Call the FEMP SAVEnergy Program to help you address your priorities and turn them into money-saving projects.

For more information, please contact Will Prue of FEMP at 202-586-4537 or wilfred.prue@ee.doe.gov; or Karen Thomas of NREL-FEMP at 202-646-5223 or karen_thomas@nrel.gov. SAVEnergy Request Forms may be obtained at www.eren.gov/femp/techassist/audit.html.

Navy/Marine Corps Provides Worldwide Network of Technical Support

Through an array of technical assistance and support services, the Department of the Navy's Energy Program assists its shore facilities worldwide to improve energy efficiency and cut energy costs. Navy and Marine Corps facilities receive this support through a network comprised of three groups: the Energy Project Development and Execution Team; the Naval Facilities Engineering Service Center (NFESC); and the Geothermal and Energy Offices at China Lake, California.

Project Team Develops Funding Strategies

The Energy Project Development and Execution Team is responsible for performing (or contracting for) audits, and identifying and executing all fundable

Navy energy and water projects having a payback period of less than 10 years. The Team developed the idea of using central funds to supplement the cost associated with alternatively-financed projects (i.e., audits, contracts personnel, design review, and construction oversight). This financial support enables Navy and Marine Corps facilities to enter into alternative financing agreements that would be otherwise impossible to initiate due to funding shortfalls at the local level. In FY 2000, the Team executed alternatively-financed projects that invested \$74 million in energy efficiency products and services, with a net present value of \$84 million.

The Team also develops and submits all required project documentation, and participates in selecting which projects to fund centrally and which to finance via utility energy service contracts (UESC) and energy savings performance contracts (ESPC). It identifies contract vehicles, validates technical and financial details, and facilitates the contract award. The Team is comprised of representatives from NFESC; Naval Facilities Engineering Command (NAVFAC) Headquarters; Public Works Centers at Norfolk, Jacksonville, Great Lakes, Pensacola, Washington D.C., and San Diego; Naval Facilities Contracts Office; Puget Sound Naval Shipyard; Installation Management Claimants; and the Atlantic, South, Southwest, and Pacific Engineering Field Divisions of NAVFAC.

Through one alternatively-financed project, the Team provided almost \$1.3 million under the Energy UESC/ESPC Buy-down Program for a Basic Ordering Agreement (BOA) project at

Naval Support Activity Mid-South, Tennessee. The \$13.2 million project is saving \$1.7 million and 286 billion Btu annually and consists of three energy conservation measures: 1) replacing the central steam plant; 2) installing an energy management control system; and 3) performing a lighting retrofit.

NFESC Provides Critical Support

NFESC, located in Port Hueneme, California, is a vital resource for furnishing technical assistance to all levels of the Navy and Marine Corps energy management community. NFESC receives funding and direction from NAVFAC Headquarters in Washington, D.C. and operates remote offices, with 25 to 50 percent of staff working in the field at any one time.

In partnership with the Engineering Field Divisions/Activities and the Public Works Centers, NFESC solves energy and utility problems in the field by providing energy and water program support, technical consultation and specialized expertise, energy awareness programs, applications guidance, and information. These support services have been effective tools to help Naval installations cut energy costs significantly. NFESC also provides newsletters, recognition and media coverage of accomplishments, guides for energy managers, as well as a variety of other tools designed to assist local energy savings programs, including a Web site at <http://energy.navy.mil>.

"This network has become a powerful resource," said Jim Heller, NFESC



One of three 225-kilowatt wind turbines generates electricity for the Navy on San Clemente Island off the coast of California.

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NAVY/MARINE CORPS PROVIDES WORLDWIDE NETWORK OF TECHNICAL SUPPORT

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Director, Energy Programs Division. "We've been able to cut costs globally due to innovative technical support offered by this energy partnership."

With a staff of engineers, engineering technicians, analysts, computer specialists, and resource assistants, NFESC Energy and Utilities Department has been able to highlight both emerging technologies and state-of-the-art products and technologies. The Center has developed and supported projects covering the following areas:

- Natural Gas Cooling,
- Desiccant Cooling,
- Fuel Cells,
- Wind Turbine Generators,
- Solar Hot Water Systems,
- Geothermal Heat Pumps,
- Space Heating Solar Wall,
- Direct Digital Controls, and
- Boilers.

NFESC relies on support from DOE Laboratories for reviewing technical proposals to be awarded on their Super ESPC contracts. In San Diego, Lawrence Berkeley National Laboratory (LBNL) reviewed Navy ESPC proposals for high intensity discharge lighting retrofits and provided information and assistance with state rebate programs. Through a FEMP design assistance grant, LBNL and Oak Ridge National Laboratory are assisting the Navy in San Diego by developing energy-efficient exterior lighting standards and reviewing the potential for upgrading a cogeneration plant.

PV Support Provided by China Lake

Serving as adjunct staff to NAVFAC, the Geothermal and Energy Program Offices at Naval Air Warfare Center, China Lake, California, provides research, analysis, and implementation of photovoltaic energy systems. They also oversee the operation and maintenance of the 180-MW geothermal electricity generating plant at China Lake, and represent the Navy on the Tri-Services Renewable Energy Committee.

For more information, please contact Jim Heller of NFESC at 805-982-3486 or Hellerjl@nfesc.navy.mil.

FEMP Seeks Technical Assistance Projects for FY 2002

FEMP provides technical assistance, financing assistance, education, and outreach to Federal agencies meeting energy efficiency and renewable energy goals set by Executive Order 13123, the Presidential directive on "Energy Conservation at Federal Facilities," and the National Energy Policy.

FEMP would like to hear from Federal agencies that require technical assistance in the following areas:

- Energy-efficient construction,
- Energy and water efficiency retrofits of existing facilities,
- Distributed energy resources (DER) projects including renewable energy on-site generation and combined heat and power systems, and
- Industrial facility assessments.

FEMP technology experts can screen for project opportunities, conduct feasibility studies, draft procurement specifications, review project designs, and measure performance. Selected Federal agency projects will receive technical assistance from DOE National Laboratories and subcontractors selected from the best energy and sustainability consultants in the country.

The application for technical criteria and additional details are posted on the FEMP Web site at www.eren.doe.gov/femp/techassist/callforprojects.html. Applications are due by August 24, 2001.

For more information, please contact Shawn Herrera of FEMP at 202-586-1511 or shawn.herrera@ee.doe.gov.

OIT AND FEMP JOIN FORCES TO ASSIST INDUSTRIAL FACILITIES

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The Industrial Facilities Program also provides access to the following informational resources:

- Software and database packages – Available through the Best Practices Web site (www.oit.doe.gov/bestpractices/), these tools are valuable for evaluating industrial system operations and maximizing energy efficiency.
- Technical publications – Fact sheets, handbooks, and self-assessment manuals are also available through the Best Practices Web site, and cover many issues pertaining to industrial facilities operations.
- Technical and implementation tools – Available on the FEMP Web site, these tools assist energy managers with alternative financing of energy projects and procuring design and consulting services.

Recent Activities

The following site visits for plant-wide and targeted assessments have recently been completed.

- **Puget Sound Naval Shipyard, Department of Defense, Bremerton, Washington:** Targeted assessments of pier power, steam, compressed air, and welding systems. Preliminary savings estimates for the steam and compressed air recommendations are \$30,000 and \$500,000 per year, respectively. Savings and analysis for power and welding are currently underway.
- **Crown Road Processing and Distribution Center, U.S. Postal Service, Atlanta:** Plant-wide assessment. Recommendations address improvements to indoor/outdoor lighting, economizer operation (air- and water-side), air-handler repair and bay door controls. Preliminary savings estimates of \$95,000 per year represent an annual utility cost reduction of 10 percent.
- **Bureau of Engraving and Printing, Treasury Department, Washington, D.C.:** Plant-wide assessment and targeted compressed air and steam assessments. Assessment recommendations address steam system maintenance, compressor controls, economizer operation, cooling coil set point adjustment, motor upgrades, and installation of a back pressure turbine. Preliminary savings estimates of \$680,000 per year represent an annual utility cost reduction of 15 percent.

For more information, please contact Michaela Martin of ORNL at 865-574-8688 or martinma@ornl.gov; or Alison Thomas of FEMP at 202-586-2099 or alison.thomas@ee.doe.gov.

Your Alternative Financing Questions Answered

Who is eligible to use a Super ESPC?

All Federal agencies that have Federally-owned facilities within the geographic scope of the contract with DOE may utilize Super ESPCs by issuing and administering delivery orders against them for the purpose of implementing energy savings projects.

What is the difference between a contractor-identified project and a Government-identified project?

There are distinctions in the activities required to issue a delivery order through a single source (or contractor-identified) process and a competitive delivery order. In a contractor-identified project, an energy service company (ESCO) requests and receives permission from the contracting officer representative to define a project, determine the energy conservation measures, and submit an initial proposal to the agency. With a Government-identified project, the agency defines the technical specifications of the project and assembles information on the existing energy consuming systems in the targeted buildings in the form of a site data package that is attached to a Delivery Order Request for Proposal (DO RFP).

In a contractor-identified project, only one initial proposal is received and reviewed to determine whether it is a “go” or “no go” project. Only one ESCO receives a DO RFP that contains no site data package. With a Government-identified project, multiple ESCOs receive a DO RFP that contains the agency-prepared site data package and evaluation criteria. Multiple initial proposals are received and evaluated by the agency in the process of selecting one ESCO.

The single-source route to awarding a delivery order requires fewer resources from the agency and is typically faster. However, the competitive award route offers the agency the opportunity to review different technical and pricing approaches to the project.

Whether an agency decides to issue a delivery order on a competitive or non-competitive basis, implementing a project involves entering into a long-term partnership with a contractor. As always, FEMP is here to assist agencies with their alternative finance projects.

*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 at tatiana.strajnic@ee.doe.gov.*

GSA's Richard Russell Building Earns ENERGY STAR® Rating with Super ESPC

Recent upgrades in the Richard B. Russell Federal Building system, made via a FEMP Super Energy Performance Savings Contract (ESPC), have earned the building an ENERGY STAR® rating, the first GSA-owned building in the eight-state Southeast Sunbelt Region to achieve this distinction. The Russell Building is a 1.25 million square foot mixed-use facility located in downtown Atlanta, Georgia, housing the U.S. District Court, Northern District of Georgia/Atlanta Division, and offices for several other Federal agencies, including the DOE Atlanta Regional Office.

The Russell Building has been upgraded to an ENERGY STAR® building, effective May 1, 2001, through a Super ESPC between the GSA's Southeast Sunbelt Region and the ERI Services Division of NORESO (ERI). Initially, GSA intended to have ERI, the selected contractor, only modify the Peachtree Summit building, their Sunbelt Region

headquarters in downtown Atlanta, by replacing chillers and upgrading lighting. However, ERI found significant additional energy savings in the Russell Building and the nearby U.S. Court of Appeals, Eleventh Circuit building. As a result, the ESPC eventually included energy upgrades in all three buildings—a total of 2.35 million square feet owned by GSA. The total ERI capital investment in the multi-building ESPC, finalized in September 1999, was \$6.44 million, with GSA making payments over a 20-year period at a guaranteed savings of 18 percent.

ERI began modifications to the Russell Building in the fall of 1999 and completed their work a year later. ERI replaced the building's 21-year-old chillers (two 1,720-ton centrifugal chillers) with three more-efficient (0.636 kilowatt per ton) 1,000-ton chillers with variable frequency drives (VFD). The chiller replacement in January 2000 was a daunting task, since the equipment to be

replaced was on the fifteenth floor in the Russell Building. To make the job even more difficult, ERI had to bring a mammoth crane into downtown Atlanta on a weekend when the city was hosting the Super Bowl just a block away from the Russell Building, and Atlanta was experiencing a major ice storm that virtually shut down the city. In spite of these challenges, ERI replaced the chillers and maintained the schedule in the ESPC.

Another upgrade involved adding VFDs to the Russell Building air handling units. Upgrading the lighting fixtures throughout the building was the third major modification, converting from the existing four-T12 lamp configuration to two-T8 lamps with specular reflectors. Overall estimated energy reduction from the ESPC project amounted to 5.2 million kilowatt hours per year for the Russell Building. During the one-year period, February 2000 through January 2001, when the upgrades were being made, building energy use was 3.2 million kilowatt hours less than the previous year, and the energy performance of the Russell Building achieved an ENERGY STAR® rating of 79 (a rating above 75 merits the ENERGY STAR® label). With the modifications now complete, energy performance is expected to improve further.

The Russell Building offers an excellent example of a successful Super ESPC project. GSA is a happy customer, ERI has distinguished itself as a FEMP ESCO, and the taxpayers now have a much more energy-efficient Federal building in Atlanta.

For more information, please contact Rich Combes of DOE Atlanta Regional Office at 404-562-0563 or rich.combes@ee.doe.gov.



Crane replaces chillers in Richard B. Russell Building in Atlanta, Georgia, January 2000.

Improving Energy Efficiency in Packaged Rooftop Systems

While the efficiency of most types of air conditioning equipment has improved over the last decade, commercial packaged air conditioners have experienced few changes. “Packaged rooftops,” sometimes called “commercial unitary air conditioners,” the generally 5 to 20 ton (60,000 to 240,000 Btu per hour) boxes frequently seen on the top of low-rise commercial

SEER regulation became effective, EPA initiated an ENERGY STAR® program directed at these residential central air conditioners. The qualifying threshold was set and remains at 12 SEER. Now, nearly 40 percent of models for sale meet this high-efficiency level, and some manufacturers produce equipment with efficiencies up to 18 SEER. Similarly, an October 2000 NAECA standard for

equipment in the 0.4 to 0.5 kilowatt per ton range.

Packaged rooftops have been a conspicuous exception to this trend towards higher efficiency. The Energy Policy Act of 1992 (EPAct) instituted as national minimum legal efficiencies in 1994 and 1995 the less ambitious levels prescribed in ASHRAE 90.1-89 (90.1-99's predecessor, from a decade earlier) of 8.9 EER for 5.5 to 11 ton (65,000 to 135,000 Btu per hour) systems and 8.5 EER for 11 to 20 ton (135,000 to 240,000 Btu per hour) units.

... the DOE standards will serve to “push” up the bottom of the market, ENERGY STAR® aims to “pull” the top higher.

buildings, are on average significantly less efficient than other common types of cooling equipment. Routinely, poor installation and maintenance practices, as well as overextended product lifetimes, only add to the problem. The average commercial unitary air conditioner in California is 15 years old, according to a recent study.

The story is quite different with some close cousins of packaged rooftops. Most residential central air conditioning systems are required by the National Appliance Energy Conservation Act (NAECA) to meet a minimum efficiency of 10.0 Seasonal Energy Efficiency Ratio (SEER)—measured in Btu of cooling per watt hours of electricity consumed. In the mid-1990s, a few years after the 10

room air conditioners requires most models to meet an Energy Efficiency Ratio (EER) of 9.7 or 9.8—10 to 15 percent higher than the previous standard, which had been in effect since 1990. More than 50 models for sale already meet the ENERGY STAR® threshold of 10 percent higher than these new NAECA levels.

Efficiency gains have not been restricted to residential equipment. A decade ago, energy use ratings for water-cooled electric chillers of 0.6 kilowatt per ton were considered highly efficient. Now the ASHRAE 90.1-99 Standard, which has already been incorporated into several state building codes, requires a ceiling of .58 kilowatt per ton, and most U.S. chiller manufacturers make

There are several voluntary efforts which promote higher efficiencies than those required by EPAct. The most prominent example is the Consortium for Energy Efficiency's (CEE) High Efficiency Commercial Air Conditioning initiative, which sets packaged rooftop EER thresholds for its member utilities' demand side management rebate programs. A second is the FEMP Buying Energy Efficient Products Program, which adopted CEE's “Tier I” levels (10.3 EER for 5.5-11 tons, 9.7 EER for 11-20 tons) for its *Product Efficiency Recommendation* on commercial unitaries.

Despite the success of these and other efforts at increasing the availability of high-efficiency models, the most efficient equipment available still has EERs of only about 12. However, a few recent developments should mean much improved efficiency for this equipment over the next several years. First, and most importantly, EPAct mandates that

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IMPROVING ENERGY EFFICIENCY IN PACKAGED ROOFTOP SYSTEMS

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DOE must either: a) institute new minimum national standards for packaged rooftops matching any change in ASHRAE Standard 90.1 (two to three years following the effective date in 90.1, depending on equipment capacity); or b) consider higher standards, if convincing evidence indicates that more stringent levels are “technologically feasible and economically justified.” In a January *Federal Register* notice, the DOE stated its intention to consider standards higher than the ASHRAE 90.1-99 levels for both the smaller and larger capacity equipment.

A development with more near-term implications is EPA's imminent ENERGY STAR® program on packaged rooftops. While the DOE standards will serve to “push” up the bottom of the market, ENERGY STAR® aims to “pull” the top higher. With an expected launch date this summer, the program likely will establish CEE's “Tier II” efficiency levels of 11.0 and 10.8 EER for the smaller and larger capacities, respectively, as qualifying for the prestigious ENERGY STAR® label. FEMP collaborated in the development of the ENERGY STAR® program and plans to revise and re-issue its *Product Efficiency Recommendation* on commercial unitary air conditioners, as well as commercial size air- and water-source heat pumps, which are also covered by the ENERGY STAR® program, to match the qualifying efficiency levels that EPA is setting.

The latest news on packaged rooftops is a plan by the Defense Logistics Agency (DLA) and Pacific Northwest National Laboratory (PNNL) to issue a coordinated innovative procurement for

a “new generation” of packaged rooftops. The procurement, which is being supported by both FEMP and DOE's Office of Building Technologies, State and Community Programs, in addition to the Department of Defense, will seek to promote the manufacture of equipment that improves both performance and cost-effectiveness compared to models now on the market. PNNL has provided the technical and market research to initiate the procurement, and has also recruited several large prospective buyers, both within and outside the Government. The solicitation, which will require that manufacturers bid equipment that at least meets the CEE Tier II / ENERGY STAR® / FEMP efficiency levels, will prescribe a cost-effectiveness formula that will weigh the initial price of the equipment against expected energy costs and will take into account average weather conditions and both full- and part-load efficiencies. Models with the lowest total life-cycle

cost will win and then be offered by DLA and PNNL under a basic ordering agreement with established prices and terms. The solicitation is expected to be issued early this summer and equipment should be available for purchase by early 2002.

These three developments—the institution of a higher minimum efficiency standard, the launch of an ENERGY STAR® program for packaged rooftops, and the issuance of a procurement for more efficient next-generation equipment—mean the efficiency of packaged rooftops should increase dramatically over the next several years.

For more information, please contact Alison Thomas of FEMP at 202-586-2099 or alison.thomas@ee.doe.gov.

Secretary of Energy's Report to the President

Energy Conservation Actions Taken at Federal Government Facilities in Response to the May 3, 2001 Presidential Memorandum

On May 3, 2001 President Bush issued a directive to the heads of Executive Departments and agencies to take appropriate actions to conserve energy use at Federal facilities. The directive required agencies to report to the President on their energy conservation actions within 30 days through the Secretary of Energy. The Secretary's Report to the President summarizes actions taken to reduce electrical demand, as reported as of June 8, 2001, by 34 agencies. The report can be viewed online at www.eren.doe.gov/femp/resources/dir_report.html.

Energy 2001: A Whirlwind of a Workshop

Two days before the start of the Energy 2001 Workshop and Exposition, tornadoes and heavy thunderstorms rumbled through the Kansas City, Missouri area, driving local residents to their basements for shelter. Unknown to attendees, this was a precursor for the swirling intensity of this year's annual energy workshop, hosted by DOE's Federal Energy Management Program (FEMP) and co-hosted by the Department of Defense (DoD) and the General Services Administration (GSA).

A packed opening reception kicked off record attendance for the annual event. Nearly 1,150 attendees, speakers, and exhibitors filled the Hyatt Regency Crown Center in Kansas City for three days of nonstop presentations, meetings, and exhibits. Meeting rooms were filled for every session, with overflow crowds standing in hallways to hear some presentations. The two guest speakers—architect Bob Berkebile and motivational speaker Keith Harrell—helped rank the plenaries among the best that attendees had heard according to the workshop questionnaire and attendee comments. Technical tours associated with the workshop took attendees to UtiliCorp United's historic home, EPA Region VII Headquarters, and the new Missouri Department of Conservation's Discovery Center.

The success of the three previous annual workshops prompted meeting organizers to expand this year's program to nine technical tracks—acquisition, electric utility deregulation, facility operations and maintenance, laboratories and industrial facilities, project financing, renewable applications and water conservation, sustainable building design, technology, and a basic primer called “Energy 101.” There was also a well-attended pre-workshop training program on “How To Do Business With the Federal Government.”

Several other activities were organized and provided along with the Energy 2001 event. These included a pre-workshop ASHRAE course on “Design of Commercial Ground-Source Heat Pumps” and a post-workshop AEE training on “Skills Update for Trained Energy Managers.” In addition, a Federal Energy Management Advisory Committee meeting was held in conjunction with the event.

The opening plenary included welcoming remarks from Kansas City Mayor Kay Barnes, FEMP Director Beth Shearer, DOE Chicago Regional Office Director Peter Dreyfuss, Cathy

Ghandehari from the DOE Denver Regional Office, and Paul Lynch from GSA Headquarters, along with Berekbile's fascinating presentation on a number of sustainable building projects. The opening plenary also included a presentation of the 2001 Federal Energy Saver Showcase awards (see pages 14 to 16). More than 60 sessions featured 170 speakers from a variety of Government agencies and private companies discussing case studies, new products, and strategies for energy efficiency, and examining the issues and events affecting Federal energy managers.

Attendees at the full-house closing plenary luncheon heard newly appointed Assistant Secretary, Energy Efficiency and Renewable Energy, David K. Garman speak on the importance of energy efficiency and renewable energy in the Federal sector. In his speech, Garman said that “. . . now more than ever, we must seize opportunities to save energy, enhance our use of renewables, and lead by example.” His talk was followed by a presentation by Randall Yim, Deputy Under Secretary of Defense for Installations, DoD. Yim stressed that, “. . . energy savings performance contracts and utility energy savings contracts will continue to play a major role in our energy conservation progress.” The luncheon concluded with Harrell's fast-paced, highly motivational presentation that had everyone on their feet.

This year's exposition was the biggest yet with 100 companies staffing 124 exhibit booths. Raffle items donated by local restaurants, exhibitors, and others helped keep the exhibit hall filled with workshop attendees. A Tuesday night Gala at historic Union Station gave attendees and exhibitors a chance to mingle and enjoy the many activities in the Science City hands-on education center.

Rick Klimkos of FEMP, who served as Conference Executive, directed the Energy 2001 Organizing Committee. Sharon Gill of the DOE Chicago Regional Office and Randy Jones of the DOE Denver Regional Office were co-chairs. Co-hosts were Bob Billak of DoD and Mike Ziskind of GSA.

Planning for the Energy 2002 Workshop and Exposition is now underway. Energy 2002 will be held June 2-5, 2002 at the Palm Springs, California, Convention Center.

For more information about Energy 2002, please visit www.energy2002.ee.doe.gov.

2001 Energy

Randy Jones, DOE Denver Regional Office and Co-chair of Energy 2001, and Bill Klebous, DOE Philadelphia Regional Office, at the opening reception for Energy 2001.



Paul Lynch, GSA; Ralph Newton, DoD; and Beth Shearer, FEMP; (left to right) open the Energy 2001 Exposition.



Energy 2001 Gala at Kansas City's historic Union Station.



Achievements and Accolades

FEMP Awards 2001 Federal Energy Saver Showcase Facilities

Eighteen outstanding Federal facilities were recently awarded Federal Energy Saver Showcase designation at the annual Energy 2001 Energy Efficiency Workshop and Exposition held in Kansas City, Missouri. At the ceremony, FEMP Director Beth Shearer, presented representatives from each site with their designation plaque. These plaques are then displayed prominently at the showcase facility, notifying visitors they are entering a Government building that uses energy and water wisely and saves taxpayer dollars. These 18 facilities are expected to save the Government 50 million kilowatt hours of energy, or about \$2 million in energy costs, each year.

Since 1995, FEMP has recognized more than 70 facilities across the country as Federal Energy Saver Showcases. Located throughout the nation, this year's showcase facilities utilize technologies and strategies that range from a comprehensive energy retrofit project of a 29-building Federal facility campus and an installation of the nation's largest commercial fuel cell system to the use of off-the-shelf technologies. Each facility nominated by their respective agencies features energy efficiency, renewable energy, or water conservation technologies designed to save natural resources and reduce operating costs. FEMP commends all the individuals and agencies who have contributed to the successful implementation of these projects. The following are brief descriptions of each showcase facility.

Department of Agriculture – Animal and Plant Health Inspection Service Wildlife Services – National Wildlife Research Center Animal Research Building Fort Collins, Colorado

Despite their limited building and maintenance budget, the USDA made effective use of off-the-shelf technologies to save energy and conserve water. A new building control system, electrical duty timers, and boiler combustion analysis reduces energy consumption by almost 35 percent, while new water pressure pumps and set-back timers on the high pressure steam boilers save more than 400 million gallons of water each year.

Department of Commerce – National Oceanic and Atmospheric Administration Guam Weather Forecast Office Barrigada, Guam

This low-maintenance, energy efficient building is designed so that the HVAC and lighting systems use up to 30 percent less energy than a conventional building. Energy savings are achieved through the use of high-efficiency HVAC and lighting systems, passive solar design to maximize natural daylighting and minimize solar heat gains, while use of recycled and non-toxic materials help to meet sustainable design goals and improve indoor air quality.

Department of Defense – Navy MCPON Plackett Manor Great Lakes Naval Training Center Great Lakes, Illinois

This Leadership in Energy and Environmental Design (LEED)-certified sustainable design project, the first of its kind for the Navy, entailed design and construction of nine new dormitory facilities to house more than 2,000 sailors. As part of the sustainable design process, energy efficiency goals were established and the project was designed to minimize impact on undeveloped land and make use of existing utilities and transportation infrastructure.



Presentation of 2001 Federal Energy Saver Showcase Awards.

**Department of Energy
Fermi National Accelerator Laboratory
Batavia, Illinois**

Since the inception of the Laboratory's utility-based, alternatively-financed, campus-wide energy efficiency program in 2000, energy-efficient lighting systems, occupancy sensors, and direct digital controls have been installed and transformers, motors, and cooling towers have been replaced. Replacement and reconfiguration of the cooling towers and compressors used in the Central Helium Liquefier Plant have produced additional energy and operational efficiencies, resulting in 30 percent savings.

**Department of Health and Human Services
Albuquerque Public Health Service Indian Hospital
Albuquerque, New Mexico**

To reduce energy use, and associated costs of the existing HVAC system, a geothermal heating and cooling system consisting of 210 closed-loop boreholes was installed. To further improve efficiency, the system was upgraded with variable speed pumps and direct digital controllers.

**Department of Health and Human Services
Program Support Center
Parklawn Building
Rockville, Maryland**

Over 2 million kilowatt hours and 6.3 million gallons of water will be saved annually due to the recent installation of energy-efficient lighting upgrades, and water-conserving fixtures financed through a utility energy savings contract. More than 90,000 people visit the Parklawn building each year.

**Department of the Interior – Fish and Wildlife Service
Cusano Environmental Education Center
John Heinz National Wildlife Refuge at Tinicum
Philadelphia, Pennsylvania**

This innovative new building incorporates geothermal heating and cooling, energy-efficient lighting, a well-insulated building envelope and natural daylighting to reduce building energy consumption, improve occupant comfort, and demonstrate the Center's mission to the thousands of visitors expected each year. Other sustainable design strategies include use of recycled materials and an on-site "marsh machine," an organic wastewater treatment plant.

**Department of State
Florida Regional Center
Oakland Park Facility
Ft. Lauderdale, Florida**

This "solar showcase facility" demonstrates the cost and energy saving potential of solar energy sources in geographic locations best suited for their application. Solar photovoltaic panels power parking lot lights to provide much-needed evening illumination for the building's parking lot, and flat-plate solar collectors mounted on the building's roof provide heating for domestic hot water.

**Department of the Treasury
Bureau of Engraving and Printing, Main Building
Washington, D.C.**

Vintage 1960s cooling towers and chillers were recently replaced with new high-efficiency units, reducing energy consumption by almost 40 percent. In addition, a new carbon fluidized bed/thermal oxidizer, needed to control volatile organic compounds (VOCs) emissions from the currency printing process, significantly reduces natural gas consumption while also reducing nitrous oxide emissions by as much as 96 percent.

**Department of Veterans Affairs
Salt Lake City Health Care System
Salt Lake City, Utah**

Through a comprehensive energy retrofit project of all 29 buildings on the campus, almost \$500,000 will be saved each year in energy costs alone. By using an energy savings performance contract, the center was able to install 16 energy conservation measures, including a solar domestic water heating system, a new medical waste sterilizer, a new chiller plant, and HVAC equipment.

**General Services Administration
Ralph H. Metcalfe Federal Building
Chicago, Illinois**

The GSA, working with the EPA and the DOE, recently completed a roof-mounted, grid-connected photovoltaic system on the Metcalfe Federal Building. This system not only saves energy, but also reduces carbon dioxide emissions and meets the requirements of the Million Solar Roofs initiative.

continued on page 16

Achievements and Accolades

FEMP AWARDS 2001 FEDERAL ENERGY SAVER SHOWCASE FACILITIES

(continued from page 15)

General Services Administration Richard B. Russell Federal Building Atlanta, Georgia

This ENERGY STAR® Building incorporates energy-efficient lighting systems together with new high-efficiency and non-CFC HVAC equipment to achieve significant energy and cost savings while providing environmental benefits. An energy savings performance contract was utilized to finance the energy conservation measures rather than use appropriated funds.

General Services Administration Leo W. O'Brien Federal Building Albany, New York

One of two pilot projects in the Northeast Super ESPC program, this energy efficiency project included installation of building automation systems, energy-efficient lighting, and electric-to-gas conversion of the building's HVAC and domestic hot water systems. A rebate from the New York State Energy Research and Development Authority made this energy-saving project even more cost-effective.

National Aeronautics and Space Administration Dryden Flight Research Center Aircraft Support Facility, Building 1623 Edwards, California

In replacing the oversized and inefficient aircraft hangar heating system in Building 1623 with a modern forced-air system employing a solar ventilation air pre-heating system and modular gas-fired condensing boilers, NASA simultaneously improved indoor air quality, reduced greenhouse gas emissions, and saved energy. Emissions reductions were so significant the boilers no longer require expensive air permitting.

United States Postal Service Anchorage Processing & Distribution Center/ Air Mail Facility Anchorage, Alaska

The high-tech plant in this facility is powered by five 200-kilowatt natural gas phosphoric acid fuel cells, the nation's largest commercial fuel cell system. Not only do the fuel cells provide

enough electricity to power the entire facility, they also create enough waste heat to meet most of the building's thermal load, thereby further reducing overall energy consumption.

United States Postal Service Center Ossipee Post Office Center Ossipee, New Hampshire

This project was completed as part of a district-wide energy efficiency retrofit program, saving significant energy and dollars. With the installation of efficient lighting upgrades and LED exit lights, the Post Office achieved 40 percent energy savings per square foot. Future upgrades for the New Hampshire district include installation of setback thermostats, hot water heater timers, and point-of-use hot water heaters.

United States Postal Service Center Sandwich Post Office Center Sandwich, New Hampshire

As part of a district-wide energy efficiency retrofit program, efficient lighting upgrades and LED exit lights are cutting costs and saving energy. This facility, just one of 111 New Hampshire Postal Centers that has undergone these efficiency upgrades, uses 43 percent less energy per square foot. Future upgrades for the entire New Hampshire district include installation of setback thermostats, hot water heater timers, and point-of-use hot water heaters.

United States Postal Service Gilsum Post Office Gilsum, New Hampshire

As part of a district-wide energy efficiency retrofit program, efficient lighting upgrades and LED exit lights are saving significant energy and dollars. This highly replicated project saves this facility alone 40 percent in energy per square foot. Future upgrades planned for the entire New Hampshire district include installation of setback thermostats, hot water heater timers, and point-of-use hot water heaters.

For more information, please contact Trina Brown of NREL-FEMP at 303-384-7518 or trina_brown@nrel.gov.

Success Is In the Air

DOE's Wind Power Purchase In New Mexico

At the DOE Albuquerque Operations Office, the Utility and Energy Management Team (UEMT) recently bought 1.5 million kilowatt hours of wind energy for the Waste Isolation Pilot Plant (WIPP), near Carlsbad, New Mexico. This is the first step toward the DOE Albuquerque commitment to increase its supply of non-hydro renewable energy by about 10 megawatts by 2010.

Under contract for many years, the Southwestern Public Service Company (SPS) supplies WIPP with system power, and now with wind energy generated at Clovis, New Mexico. DOE's purchase of 80 percent of the capacity of the Clovis wind turbine triggered a New Mexico Public Regulation Commission requirement that SPS install another wind turbine in the state. The second turbine will double the New Mexico wind energy capacity and will stimulate the New Mexico wind energy industry.

Milton West and Michael Loera, of the DOE Albuquerque UEMT, were assisted by Al Zelicoff and Ralph Wrons, of the Sandia National Laboratories, in acquiring the WIPP wind power. The Sandia Wind Energy Technology Department also worked on this project.

UEMT's decision to buy green power coincided with contract negotiations with SPS for a 10-year electric service contract. In addition to the usual electricity generated from fossil sources, DOE Albuquerque included renewable energy as part of the total requirement for electricity. UEMT used the General Service Administration areawide contract with SPS to accomplish its goal.

AL staff found that buying wind energy was easier because the SPS Renewable Energy Rider Tariff, approved by the New Mexico regulators, was available to most SPS customers. The SPS tariff rate for the 1.5 million kilowatt hours of wind energy is \$0.03 (3 cents), a kilowatt hour above the cost of system power. The 12-month cost is about \$45,000.

Interestingly, the overall effect of the 3-cent premium was reduced by escalating fuel cost adjustments. With these adjustments, during a 3-month period, the premium was effectively reduced by 20 percent—to \$0.024 (2.4 cents). This happened because the SPS Renewable Energy Rider Tariff excludes fuel cost adjustments on those kilowatt hours of renewable energy a customer purchases.

DOE funds the wind energy premium with energy cost savings earned from a chilled water storage tank project at the Sandia Processing and Environmental Testing Laboratory in Albuquerque. The cost savings from this tank are conservatively estimated at more than \$90,000 a year.

The Albuquerque UEMT and its Sandia Lab partners are exploring options for renewable energy at Sandia's Albuquerque facilities on Kirtland Air Force Base and geothermal power for the DOE Sandia facility at Tonopah, Nevada, and the Los Alamos National Laboratory.

Lessons Learned

The AL UMET found two elements—or lessons learned—that made the process smoother.

- First, UMET used the GSA areawide contract and avoided extensive negotiations with the SPS, since GSA staff negotiated all the standard clauses and requirements earlier. This allowed DOE staff to focus on the SPS tariff, rates, and the terms and conditions of service for the WIPP facility.
- Second, the availability of a State-approved renewable energy tariff also made the procurement much easier. With a tariff approved by a State utility or regulatory commission, the price of the energy—whether it is for system power or power generated from renewable sources—is deemed as just and reasonable. This allows the Government contracting officer to avoid an extensive cost and pricing effort.

The renewable energy tariff also provides DOE added protection. After the first year, the AL UEMT can continue renewable energy services on a month-to-month basis or cancel its subscription. With few vulnerabilities, the opportunity to increase Federal Government use of wind-generated electricity is greatly enhanced.

For more information, please contact Milton West of the DOE Albuquerque Operations Office, Energy Management Team (AL UEMT) at 505-845-4452 or mwest@doeal.gov; Michael Loera of the AL UEMT at 505-845-4302 or mloera@doeal.gov; or Roger Hill of Sandia National Laboratories at 505-844-6111 or rrhill@sandia.gov.

Photovoltaic Panels Stolen from Joshua Tree National Park

While energy consumers in California are paying record prices for electricity from the power grid, Joshua Tree National Park has been a national model for offsetting the demand for, and cost of energy through its use of off-grid solar-powered photovoltaic (PV) systems. This Federal Energy Saver Showcase facility's success story was recently marred by the theft of 14 PV panels at the Park's Indian Cove Campground amphitheater. The 3 x 4-foot panels, valued at approximately \$6,000 each, supplied energy to the projection equipment used by park rangers to present evening slide programs and to the lights that illuminate the pathway of the amphitheater. In addition to the PV panels, all of the

conduit lines and the combination box were stolen.

The Department of the Interior has almost 1,000 such systems providing critical energy for facility power, lighting, and water pumping. The systems are used primarily at remote locations in California and other western states. The costs of these systems range from a few thousand dollars to more than a million dollars. With rising energy costs nationwide, they may be the targets of additional thefts.

The Interior Department's Office of Managing Risk and Public Safety, with assistance from the Office of Acquisition and Property Management, issued an

advisory to Interior's law enforcement community regarding the theft at Joshua Tree and the need to take steps to safeguard against potential thefts, particularly in the wake of energy problems that a number of states are experiencing. Local law enforcement authorities and the FBI were also notified about the theft at Joshua Tree. National Park authorities at Joshua Tree are exploring steps to protect its other systems.

For more information, please contact Michael Kaas of the Interior Department at 202-208-3760 or michael_kaas@ios.doi.gov; or Debra Sonderman of the Interior Department at 202-208-6352 or debra_sonderman@ios.doi.gov.

Web Site Provides Guidance for Electricity Bill Rebates

The DOE Lawrence Berkeley National Laboratory has released "The 20% Solution" Web site to help Californians reduce energy use by 20 percent or more. The site, which was developed by scientists in the Lab's Environmental Energy Technologies Division, identifies energy efficiency measures and their predicted percentage savings to help meet California's "20/20" Program.

The 20% Solution Web site at <http://savepower.lbl.gov/> provides guidance on how to slash electricity use in the home or office by 20 percent and earn a 20 percent electricity bill rebate this summer.

The rebate program, also known as the 20/20 Challenge, offers a 20 percent rebate on June to September 2001 electricity bills for customers of Pacific Gas and Electric, San Diego Gas and Electric, and Southern California Edison who use at least 20 percent less electricity than they consumed during June through September 2000.

For more information on the 20/20 Program, please see the June 2001 Electricity Reliability Special Issue of the FEMP Focus. Available online at www.eren.doe.gov/femp/newsevents/femp_focus/jun01_contents.html or through the Energy Efficiency and Renewable Energy Clearinghouse at 1-800-363-EREC.

Updated Life-Cycle Costing Tool Now Available

Life-cycle costing is a valuable economic tool for selecting energy efficiency projects. You want to meet the Federal Government's goals for reducing energy and water consumption, but you don't want to do it at any cost. Your strategies have to be cost-effective; they have to save more than they cost. To determine whether your investment decisions are economical, life-cycle cost (LCC) analysis is the tool to use. LCC analysis is a straightforward method of evaluating all costs that are relevant to acquiring a building or a system, owning and operating it, and disposing of it at the end of its useful life. This powerful tool looks at all costs, not just initial costs or the costs up to the time that payback is achieved. LCC, required by legislation since the 1970s, was emphasized again in Executive Order 13123, which mentions LCC 26 times.

If you think it is too complicated to perform an LCC analysis, take another look. The most challenging part is to identify the effects or savings from your energy or water conservation strategy and to translate these energy- and water-related savings into dollar amounts. After you have performed this evaluation, you can begin to calculate life-cycle costs. You can even do some LCC analyses on the back of an envelope. And for more complicated analyses, FEMP provides assistance that includes computer programs, videos, a number of publications, and several workshops.

A key tool to assist Federal energy managers is the Building Life-Cycle Cost (BLCC) computer program developed and supported by the National Institute of Standards and Technology (NIST) under FEMP sponsorship. The latest updates of the BLCC programs, BLCC4 and BLCC5, were released April 1, 2001. The LCC team at NIST updates the programs annually to include the latest DOE/FEMP discount rates and energy price projections from the Energy Information Administration. BLCC4, a DOS-based program, is being transferred into the multi-platform BLCC5 with a graphic user interface. BLCC5 includes modules for energy and water conservation and renewable energy projects for either agency-funded or financed projects through energy savings performance contracts or utility energy service contracts. A designated module for Military Construction (MILCON) analyses is next in line for development. Both programs can be downloaded from the FEMP Web site at www.eren.doe.gov/femp/techassist/softwaretools/softwaretools.html.

For a detailed explanation of the principles of LCC analysis and how LCC analysis can be applied to energy and water conservation projects, you can request Handbook 135, *Life-Cycle Costing Manual for the Federal Energy Management Program*, from the DOE HELP Desk at 1-800-DOE-EREC (1-800-363-3732). You can also download Handbook 135 from the NIST Office of Applied Economics Web site at www.bfrl.nist.gov/oae/publications/handbooks/135.html. The FEMP HELP Desk and Web site also have available the Annual Supplement to Handbook 135, *Energy Price Indices and Discount Factors for Life-Cycle Cost Analysis*, April 2001—a publication that contains tables of the discount factors that are embedded in the computer programs.

For further information on the LCC method and BLCC programs, please contact Sieglinde Fuller at sieglinde.fuller@nist.gov or Amy Boyles at amy.boyles@nist.gov at the Office of Applied Economics, Building and Fire Research Laboratory, NIST. The NIST Web site is available at www.bfrl.nist.gov/oae.

TOWARDS BETTER ECONOMIC ANALYSIS...



EnergyPlus Now Available on the Web

On April 12, 2001, DOE unveiled EnergyPlus Version 1.0, a new-generation building energy simulation program designed for modeling buildings with associated heating, cooling, lighting, ventilating, and other energy flows. The software was presented at the National Building Museum's "Buildings for the 21st Century" lecture series. Drury Crawley, manager of the Building Technology Tools and Commercial Buildings R&D programs, and the EnergyPlus Team, demonstrated the flagship software system that combines the best features of the simulation programs BLAST and DOE-2. Simulation capabilities include: heat and mass balance, simultaneous loads, multiple time steps, and modular code structure.

EnergyPlus adds several new capabilities to improve whole-building approaches in design, planning, and construction, such as:

- User-definable reporting;
- WINDOW 5 calculations;
- User-configurable object-based HVAC components;
- Electrical system, and solar thermal, and photovoltaic models; and
- TRNSYS and SPARK connections and links to CAD.

The software is available at www.eren.doe.gov/buildings/energy_tools/energyplus/. Software user support is available on the Web site through e-mail request. Development of the next version of EnergyPlus is scheduled to begin October 2001 and thereafter will be updated on an 18-month release cycle based on recommendations from the team and user surveys.

For more information on EnergyPlus, please contact Drury Crawley of DOE at 202-586-2344 or drury.crawley@ee.doe.gov.

Upgrades of two other software systems are also now available. They include:

- **Building Design Advisor –**
A program for the initial, schematic phases of building design through the detailed specification of building components and systems, available at <http://gaia.lbl.gov/bda/>.
- **Energy-10 –**
A program for small buildings that integrates daylighting, passive solar heating, and low energy cooling strategies with energy-efficient envelope design and mechanical equipment, available at www.sbicouncil.org.



Water and Energy Utility Partnership Meeting Set for August 17

To help Government agencies better conserve both energy and water, FEMP and the San Francisco Public Utilities Commission are co-sponsoring a Water and Energy Utility Partnership Meeting on August 17, 2001, in San Francisco, California. The meeting will be held in the Alex Pitcher Community Room of the Southeast Community Facility, 1800 Oakdale Avenue, from 8:30 a.m.-3:30 p.m. Representatives of Federal, State, and local agencies, utilities, and water and energy service companies are urged to attend the meeting. The goals of the meeting are to share innovative, cost-effective strategies that help to reduce rising energy and water costs, optimize operation and maintenance, and manage labor costs.

The meeting agenda will include:

- Peak load reduction strategies;
- Cooling tower management;
- Incentives and cost rebate programs;
- Cost reduction strategies for water, energy, and sewer systems; and
- Landscape water use management.

Space is limited, so please register by calling Kim Knox at 415-923-2473 by August 3.

AEE Seminar on Measurement & Verification Fundamentals

This Association of Energy Engineers seminar will address the current fundamental methods of measuring and verifying (M&V) savings, specifically reviewing recent changes to the International Performance Measurement and Verification Protocol. Attendees will learn how to design an M&V program for their projects, consider current hot topics such as cost/accuracy tradeoffs and baseline adjustments. Attendees will also discuss the role of stipulations, maintaining space conditions, the role of verifiers, and the data needed for emissions trading.

Dates and Locations:

October 11-12 — Phoenix, AZ

November 27-28 — Lake Buena Vista, FL

For more information, please visit www.aeecenter.org/seminars or call 770-447-5083 ext. 210.



Laboratories for the 21st Century 2001 Annual Conference

October 2-4, 2001 • Hotel Washington • Washington, DC

Join private and public sector laboratory designers, engineers, owners, and operators in our nation's capital to explore the opportunities for improved energy and environmental performance in laboratories.

With a focus on a comprehensive or "whole buildings" approach, conference participants will devise new solutions to reduce costs and increase laboratory design and operational efficiency.

[<www.epa.gov/labs21century>](http://www.epa.gov/labs21century)

FEMP Training Reminders

FEMP Super ESPC

August 14-15
New York, NY
703-243-8343

Combined Heat and Power for Federal Facilities

August 16-17
Reno, NV
800-942-4978

Implementing Renewable Energy Projects

September 5-6
Golden, CO
303-526-5528

High Performance, Low Energy Laboratory Design Workshop

in conjunction with
Laboratories for the 21st Century
October 1
Washington, D.C.
[www.epa.gov/labs21century/
training/index.htm](http://www.epa.gov/labs21century/training/index.htm)
816-531-SAVE (7283)

AEE M&V Fundamentals Seminar

October 11-12
Phoenix, AZ
www.aeecenter.org/seminars
800-528-8282

FEMP Super ESPC

in conjunction with
World Energy Engineering Congress
October 22-23
Atlanta, GA
703-243-8343

AEE M&V Fundamentals Seminar

November 27-28
Lake Buena Vista, FL
www.aeecenter.org/seminars
407-934-4000

Upcoming Conferences

Integrated Energy Efficiency Congress

Cleveland, OH
www.aeecenter.org
Free Government Registrations: 703-243-8343
Other Registrations: 770-279-4390
August 29-30

NASEO Annual Meeting

Portland, ME
www.naseo.org
September 16-19

Midwest Electrical Conference and Expo

Indianapolis, IN
www.electricleagueindiana.org
October 2-3

Laboratories for the 21st Century Conference

Washington, D.C.
www.epa.gov/labs21century/
October 2-4

World Energy Engineering Congress

Atlanta, GA
www.aeecenter.org
October 24-26

Coming in the Next Issue

Project Financing

Including articles on:

- Super ESPC Progress and Trends,
- Consolidation of Super ESPC Contracting,
- GSA and Smithsonian UESC Project,
- State Department Super ESPC Project,
... and more!

FEMP Contacts

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

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