

FOCUS

Federal Sustainability Moving Forward

The Interagency Sustainability Working Group (ISWG), chaired by FEMP, is a primary coordinating body for sustainability in the Federal sector. In February 2009, the ISWG issued the report "Interagency Sustainability Working Group: Past Accomplishments, Current Priorities, and New Opportunities." It informs the new Administration of past successes, and outlines an agenda for the Federal Government to achieve its sustainability goals.

The report highlights some key accomplishments of the ISWG since its formation in 2001, including coordinating and consolidating agency policies and best practices for implementing sustainable design and construction practices. The ISWG also developed and assisted in the implementation of the Memorandum of Understanding on Federal Leadership

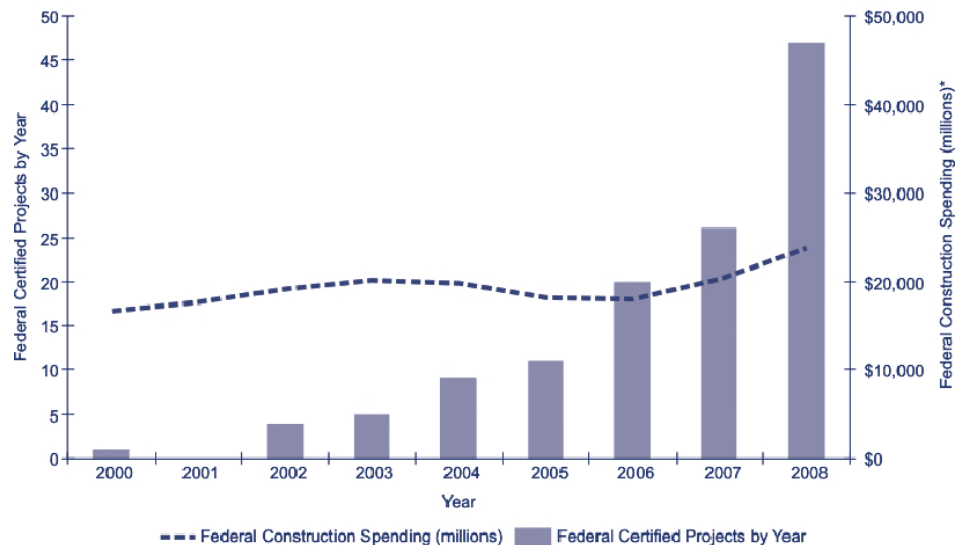
in High Performance and Sustainable Buildings in 2006, and assisted in the issuance of the High Performance and Sustainable Building Guidance of 2008.

The ISWG marks its overall progress through the improved performance of Federal buildings and communities and the increased investment in smarter, more environmentally friendly Federal buildings. One useful metric is the number and square footage of buildings that have attained Leadership in Energy and Environmental Design (LEED®) certification (the LEED Green Building Rating System was developed by the U.S. Green Building Council). As of

December 2008, there were 123 certified Federal LEED buildings totaling about 14 million square feet and located in 19 different Federal agencies. Year after year, the number of Federal LEED certified buildings and associated square footage continues to increase, while the amount of Federal construction remains relatively steady (see Figure 1). Moreover, Federal LEED buildings represent more than 5 percent of all LEED certified buildings, whereas Federal buildings in total only make up about 1.5 percent of all buildings in the United States.

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Figure 1: Federal LEED Certified Projects By Year



* based on U. S. Census Bureau statistics, adjusted to 2007 dollars (www.census.gov/const/www/fedpage.html)

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- Greenhouse Gas Emission Reduction Efforts
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- Agency Project Success Stories
- New Tools and Training Opportunities

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Cover Magnifying Glass Photo:

Wind turbine installed at Tin City Long Range Radar Site, Elemendorf Air Force Base, Alaska is a prototype for three new wind-diesel hybrid power generation systems (please see article on page 10).



The Federal Energy Management Program (FEMP) facilitates the Federal Government's implementation of sound, cost-effective energy management and investment practices to enhance the nation's energy security and environmental stewardship.

A Message from FEMP's Program Manager

Dear Colleagues,

By the time this issue of *FEMP Focus* is circulated I will have been on the job as FEMP's Program Manager for almost a year. From a personal perspective this year has been one of considerable personal growth, and has been more rewarding than I could have anticipated when I accepted the position.

Over the past year FEMP made significant changes to its internal management structure—a revision of its mission statement and a public recommitment to meeting the needs of its Federal customers. There is an increased emphasis on expanding positive collaboration between Federal agencies, DOE's national laboratories, and public and private stakeholders. With the announcement of DOE's new Super Energy Savings Performance Contract, agencies have access to a much more versatile and expansive option for financing energy efficiency improvements and on-site renewables.

As a small organization FEMP faces the constant challenge of how to better serve our Federal customers. To that end we revised our Web site to be more informative and customer-friendly. Please visit our Web site at <http://www.femp.energy.gov> to find the most up-to-date information on FEMP services, including the use of advanced and renewable energy technologies at Federal facilities, upcoming training, events, and more.

With the election of President Obama, the passage of the American Recovery and Reinvestment Act, and the ongoing consideration of the most aggressive energy bill in the history of the country, the message is being sent from the highest levels that America must now begin the transition away from a fossil fuel-based economy. It is equally clear that our elected officials expect the Federal Government to not just participate in this effort, but to lead it. It is a reasonable expectation that a new Executive Order replacing EO 13423 is likely, and that it will set even higher targets and demands for Federal agencies.

Recently I briefed the Senior Agency Officials and indicated that, while most agencies are currently meeting existing Federal mandates, our collective performance trends are leveling out. I emphasized that all agencies will need to stay focused and committed in order to meet the major 2015 requirements related to efficiency improvements, deployment of renewables, and water conservation. This advice takes on greater significance given recent and anticipated legislative and executive actions.

All agencies should consider a careful review of their internal energy management practices including governance structures, strategic planning, performance monitoring, and investment levels. Over the next year FEMP will look to expand our offerings to Federal agencies as they undertake revisions and/or expansions of existing internal energy management structures.



Now is an exciting time for us all, and FEMP is looking forward to being your partner as we collectively work to meet the challenges ahead.

Please enjoy this issue of the *FEMP Focus*.

Richard Kidd
FEMP Program Manager

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BIPV System at Sandia National Laboratories Reduces Greenhouse Gases

Energy use at Sandia National Laboratories, New Mexico (Sandia) is the largest component of Sandia's ecological footprint—accounting for roughly 82 percent of Sandia's total footprint. In an effort to reduce Sandia's energy consumption and accompanying greenhouse gases, Sandia installed building integrated amorphous silicon photovoltaic modules (BIPV) onto a parking lot shade structure.

The BIPV system consists of thin film technology that is directly integrated into a roof membrane. The 3.2 kilowatt BIPV system installed at Sandia has an ecological footprint of 1.92 global hectares and a carbon dioxide (CO₂) mitigation potential of 144 million tons throughout its lifespan. Using traditional analyses, the Sandia BIPV system has a cost

payback of 35 years (at a rate 7.5 cents/kilowatt-hour). However, a life-cycle ecological evaluation shows an energy payback of this system of just over 1.5 years. This is the time it takes the system to recover the energy, pollution, and CO₂ emissions that went into making the system. If BIPV were installed on 50 percent of the available roof space, it would offset 10 percent of Sandia's average annual energy use.

This analysis reveals that, from a life-cycle perspective, energy is clearly undervalued. The overall environmental impact of energy use and the benefits of installing renewable energy systems should be considered as part of an overall energy strategy.

For more information, please contact Israel Martinez, Sandia, at ilmarti@sandia.gov or 505-844-3027.

FEDERAL SUSTAINABILITY MOVING FORWARD (Continued from cover)

The report also identifies the ISWG's priorities for 2009 and beyond, as well as key areas of work. These include:

1. Make Sustainability the Standard Practice

- Support agencies in meeting the requirements set forth in the American Recovery and Reinvestment Act, especially with regard to incorporating sustainability into projects.
- Align sustainability goals with budget examination, support innovation in sustainability, and communicate its results.
- Reduce the budgeting and planning gap between design and delivery and operations and maintenance.

2. Transform the Existing Built Environment by Integrating Sustainability into Campus and Portfolio Management

- Explore development of a Web-based sustainable building assessment tool for use by Federal agencies to take advantage of common needs.
- Continue to support Federal sustainability goals with guidance and tools, and emphasize training for facilities management staff.
- Establish and exchange best practices for incorporating sustainability into real property reporting and environmental management systems.
- Eliminate barriers to incorporating sustainable design into historic buildings, medical facilities, and other challenging building types.

3. Measure and Verify Building Performance

- Examine sustainable building performance measurement data across agencies.
- Explore the development of a “dashboard” for whole building performance that provides a clear assessment of performance.
- Communicate the findings to key stakeholder groups, especially to inform the budgeting and planning cycles.

4. Institutionalize Greenhouse Gas (GHG) Management and Abatement

- Develop guidance and tools for reducing fossil-fuel based energy consumption in new construction.
- Provide recommendations for establishing a Federal GHG measurement protocol.
- Establish guidance for developing agency-level GHG management plans that aligns with any Federal requirements and/or roadmap for Federal-wide GHG reductions.
- Provide GHG management tools, resources, and training to Federal agencies as necessary, such as training on completing agency and site-wide emissions inventories, reporting agency-level GHG emissions, and developing and implementing GHG management plans.

The full report is available on the FEMP Web site at http://www.femp.energy.gov/sustainable/sustainable_workinggroup.html. For more information, please contact Matt Gray at matthew.gray@ee.doe.gov or 202-586-0067.

NREL Meets Energy and GHG Reduction Targets through Sustainability

The National Renewable Energy Laboratory (NREL) is the nation's preeminent institution for renewable energy and energy efficiency research and development (R&D). This article highlights NREL's efforts and progress towards meeting the energy management goals of Executive Order (EO) 13423, and the outcomes including mitigation of NREL's annual carbon footprint. Part of NREL's goal to reduce greenhouse gas (GHG) emissions is to fully integrate sustainability at the laboratory through a framework of economic viability, environmental stewardship, and public responsibility.

Beginning in fiscal year (FY) 2003, NREL conducted a comprehensive assessment of its energy use to quantify the laboratory's environmental impact. This carbon footprint extended beyond electricity and natural gas use to include fleet emissions, staff commuting and travel, solid waste disposal, and other activities (Figures 1 and 2), providing a comprehensive metric for measuring NREL's performance against GHG goals.

SOURCE	Kg CO ₂ Eq
Electricity	23,429,188
Natural Gas	4,634,065
Commuter Vehicle Emissions	2,171,715
Domestic Air Travel Emissions	2,000,383
International Air Travel Emissions	622,542
Fleet Vehicle Emissions	90,838
Solid Waste Disposal	80,978
Water (Electricity consumed)	17,435
Water (Natural Gas consumed)	14,676
Total	33,061,820

Figure 1: FY 2008 Carbon Footprint

NREL was one of the first organizations to set and meet a GHG reduction goal of reducing normalized GHG emissions by 10 percent from 2000 to 2005. Once accomplished, NREL set an even more aggressive goal to reduce total GHG emissions by 75 percent from 2005 to 2009. NREL is currently on track to meet this goal (Figure 3). In 2006 NREL became the first Federal facility to become "carbon neutral," largely by purchasing Renewable Energy Credits (RECs) and working aggressively to meet its energy use goals through energy efficiency and by generating its own renewable energy.

NREL's facilities are relatively new and were designed to be highly energy efficient. Thus, NREL's efforts to further reduce

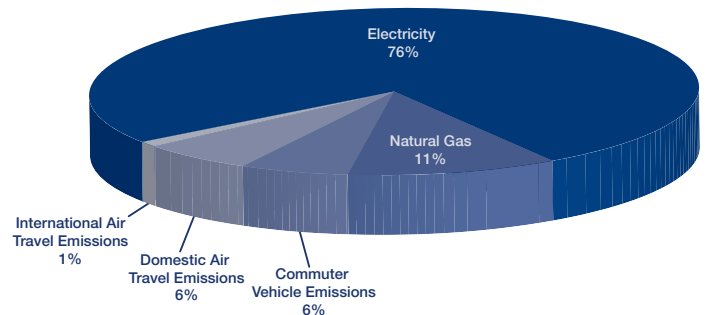


Figure 2: FY 2008 CO₂ Emissions Breakdown

energy use and GHG emissions have focused on continuing to design and construct highly efficient buildings and maximizing the use of on-site renewable energy generation. The 71,000 square foot (sq.ft.) Science & Technology Facility (S&TF), which opened in 2006, was the first Leadership in Energy and Environmental Design (LEED) certified platinum building in the Federal Government. The S&TF's energy use is only 225 thousand British thermal units (kBtu) per square foot, which is 41 percent more efficient than a conventional building built to the then current American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) 90.1 1999 standard.

The 220,000 sq.ft. Research Support Facility (RSF) will come online in 2010, and is a planned model for sustainable, high-performance design. The building was designed with an aggressive energy budget of only 25 kBtu per square foot, and will be the second certified LEED platinum building at NREL and the seventh in the Federal Government. The RSF is also expected to be the first Federal net-zero energy building.

NREL's ongoing policy is to maximize the use of on-site renewable energy, and secondarily to purchase RECs, to meet its goal of being carbon neutral. Existing renewable wind and solar energy sources generate 130 megawatt-hours (MWh) of electricity and 10 million Btu of thermal energy. In addition, the 720 kilowatt (kW) Mesa Top photovoltaic (PV) system, installed under a Power Purchase Agreement (PPA) in late 2008, displaces about 6 percent of NREL's annual electrical use.

NREL's National Wind Technology Center (NWTC) currently has more than 1,600 kW of wind turbine capacity for R&D purposes, also used to offset the NWTC site's electrical needs. Another 1.5 MW turbine will be installed at the end of FY 2009; the turbine electrical output will be sold to the grid and the RECs retained by NREL to meet GHG reduction goals.

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NREL MEETS ENERGY AND GHG REDUCTION TARGETS THROUGH SUSTAINABILITY
(Continued from page 4)

A new 115 kW roof-mounted PV system will be installed in 2009 on the S&TF, followed by a 725 kW roof-mounted system for the RSF and a 400 kW system installed on the adjacent parking structure. In 2010, NWTC will receive a 1,116 kW PV system that, together with the existing R&D wind turbines, will supply 100 percent of the site's energy requirements. In total, NREL's PV systems will generate greater than 20 percent of the lab's FY 2008 electrical needs, exceeding DOE's goal of 7.5 percent renewable electrical use by 2013.

In addition to the new PV systems, the Renewable Fuel Heating Plant, coming online for the 2009/10 heating season, will burn wood byproducts generated from urban wood wastes and forest thinnings from the Front Range Healthy Forest Initiative. This plant will replace about 75 percent of NREL's natural gas needs, exceeding DOE's goal of 7.5 percent renewable thermal use by 2013.

High performance buildings and on-site renewable energy generation are only part of NREL's solution mix. Flex-fuel vehicles make up 75 percent of NREL's fleet, contributing to a 28.1 percent reduction in petroleum fuel use in 2007, significantly exceeding the EO 13423 goal of 20 percent by 2015. NREL is also actively pursuing B20 (a mixture of 20 percent biodiesel and 80 percent diesel fuel) use in several of its large, diesel-powered vehicles. In addition, NREL has installed a "solar tree" for recharging plug-in hybrid electric vehicles (PHEV) (Figure 4).

NREL also considers staff travel and commuting as part of its overall environmental impact. The EcoPass is a free benefit to all Colorado staff, enabling the use of light rail, regional buses, and other public transportation services for free or



Figure 4: NREL EV/PHEV Charging Tree

significantly reduced rates. The laboratory also operates a shuttle between buildings and sites which operates on alternative fuel, reducing vehicle miles traveled.

To help alleviate the environmental impact from staff commuting, NREL allows its staff to work varying schedules, with management approval, including four-day workweeks. An analysis of NREL's business travel indicated that air travel accounted for 62 percent of miles traveled. By using video conferencing between their Colorado and Washington, DC offices, NREL eliminated 336,300 miles of flight travel, mitigating the release of 448,000 tons of carbon dioxide (CO₂).

Through the efforts highlighted here, NREL has met or exceeded all of its energy use goals and mitigated the release of over 33 metric tons CO₂ equivalent. Over the next ten years, NREL's total laboratory and office space will increase by a factor of five. However, its projected energy use will only triple. The lab is accomplishing these efforts by setting aggressive efficiency targets for its new buildings, continuing to add more on-site renewable energy generation, and actively pursuing sustainability throughout the lab.

For more information, please contact John Nangle, NREL, at john.nangle@nrel.gov or 303-384-7377.

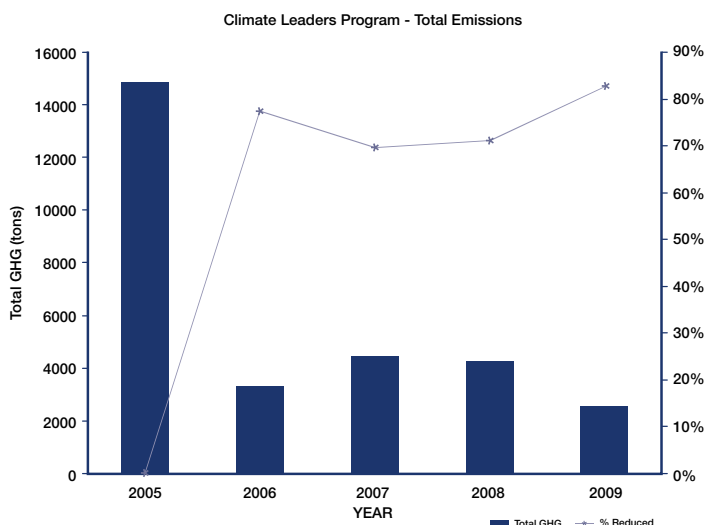


Figure 3: Total Emissions Reductions

FEMP Holds Successful Federal Agency-ESCO Forum

The Federal Energy Management Program (FEMP) successfully conducted the first of its kind Agency-ESCO Forum in March 2009. The Forum was attended by representatives of 17 Federal agencies and the 16 energy service companies (ESCOs) awarded contracts under the Department of Energy's (DOE) new indefinite-delivery, indefinite-quantity (IDIQ) Energy Savings Performance Contract (ESPC), or Super ESPC. Its purpose was to provide a platform for DOE, other agencies, and ESCOs to provide ESPC program information and address questions, comments, and concerns. The Forum effectively facilitated communication and will expedite the development and implementation of Super ESPC projects.

The Forum was conducted over three days. The first day was attended only by Federal agency staff; the second day by both agencies and ESCOs; and the third by ESCOs and DOE personnel. The first day was dedicated to reviewing all aspects of the new master IDIQ Super ESPC contract, including:

- Contract support by the 16 ESCOs (including eight ESCOs new to DOE's IDIQ contracts);
- A \$5 billion contract ceiling for each ESCO, or \$80 billion ceiling total;
- Active tracking of dollars spent under the new contract;
- Ability to support worldwide Federal management activities;
- A strong focus on renewable and high efficiency technologies; and
- New Federal enhanced competition requirements.

On the second day, ESCO representatives introduced their company histories, experience, and capabilities to agency staff. In turn, agencies including DOE, the General Services Administration, and the Department of Defense's Air Force and Navy gave presentations to the ESCOs highlighting best practices and differences and similarities in agency approaches to ESPCs. There were productive discussions of Super ESPC policies, procedures, and issues, as well as opportunities for professional networking.

The third day provided opportunities for the new Super ESPC ESCOs to discuss their corporate qualifications and capabilities and engage in question and answer sessions with FEMP staff.

Discussions throughout the meeting revealed a few primary areas for which agencies and ESCOs are looking for increased assistance and guidance from DOE/FEMP, including:

- Clarifying DOE's policies regarding risk assignment for fuel cost escalation;
- Addressing outstanding delivery orders under the old ESPC contract; and

- Streamlining the delivery order process, particularly for small/shorter-term projects.

A portion of the discussion also focused on American Recovery and Reinvestment Act (ARRA) funds. A number of Federal agencies are receiving ARRA funding to use toward Federal energy efficiency and renewable energy projects that will help reinvigorate the economy by creating green jobs and replacing old and inefficient infrastructure. There is some concern that disbursing and monitoring the spending of ARRA funds will create a contracting workload that will delay the ability for agencies to start new ESPCs in a timely manner.

Some agencies stated that they will use ARRA projects only for projects that cannot be financed, such as new building construction. There is concern that agencies will use ARRA monies for projects that can be funded quickly with short payback periods, potentially limiting the ability for ESCOs to bundle energy conservation measures (ECM) to achieve larger, more comprehensive ESPC projects later. However, based on the level of investment required to meet Federal energy management goals over the next several years, ARRA funds will not be nearly enough to cover every potential ECM throughout the Federal complex.

The group also came away with a better understanding of the fair competition requirements per the National Defense Authorization Act of 2008. FEMP is encouraging broad communication of all requests for proposal to the ESCO community. Agencies should implement a fair and reasonable process to down-select. Agency contracting officers do have substantial flexibility and discretion in implementing this provision, and it was suggested that a "two step" down selection process can both reduce cycle time and ameliorate most major agency concerns.

Follow-up action items for FEMP include:

- Resolving the utility risk issue;
- Working with the DOE to outline a plan for completing delivery orders initiated under the old contract, and setting up meetings to talk through the details with the affected agencies and ESCOs;
- Further clarifying competition requirements, including how this provision is being interpreted by DOE;
- Facilitating an improved communications process by which ESCOs may receive more timely responses;
- Addressing the issue of improved long term care of ESPCs through better monitoring and tracking of measurement and verification reports; and

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Navy Cogeneration Plant Provides Clean Energy, Saves Costs, and Supports Mission Readiness

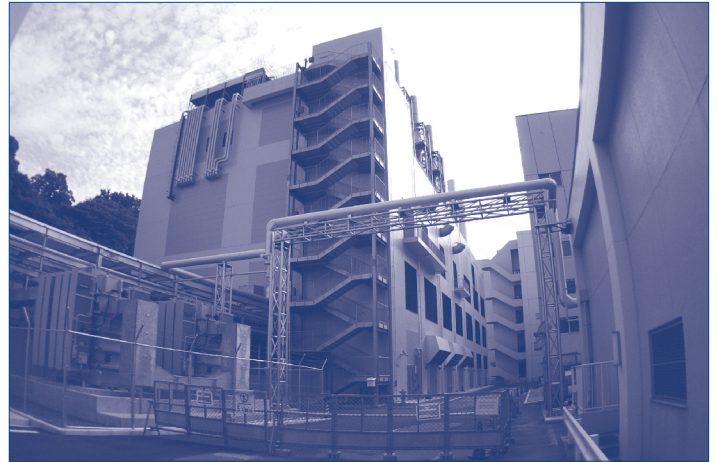
Commander Fleet Activities Yokosuka (CFAY), Japan completed installation in November 2008 of a 39 megawatt power plant that could save the Navy \$358 million over the next 20 years, while dramatically reducing harmful emissions and greenhouse gases. The first of its kind project, it is the largest Energy Savings Performance Contract (ESPC) within the Department of Defense, and represents a major milestone for the Navy Energy Program. The project features three gas turbine generators, three reciprocating turbine generators, major upgrades to former steam generation and distribution systems, and installation of a new gas line to the base. The plant meets both fleet and shore energy requirements for clean, efficient electrical power and requires no capital outlay. It will reduce energy needs, cut emissions, and increase energy capacity at no additional cost to the Navy.

“With the added power generation capacity, the new plant allows us to meet all power requirements of the forward deployed naval forces at CFAY for the foreseeable future,” said Eric Rankin, Deputy Public Works Officer, Naval Facilities Engineering Command (NAVFAC) Far East Public Works Department (PWD) Yokosuka. “The plant configuration also improves reliability of the 60-Hertz (Hz) grid by enabling it to respond more effectively to spikes and transients due to fluctuations in shore power requirements.”

ESPC Cogeneration System Overview

The ESPC stipulates that all project-related costs must be funded through energy savings rather than new capital appropriations. To ensure the project delivers the necessary savings, the NAVFAC Engineering Service Center (ESC) project manager evaluated the cost/benefit balance of the project. He teamed with contracting officers from Specialty Center Acquisitions NAVFAC, engineers and acquisition professionals from NAVFAC Headquarters, and NAVFAC Far East to weigh anticipated costs versus projected savings, based on complex technical and financial models developed by the contractor, NORESKO. This allowed the NAVFAC team to establish requirements for a quantitative measurement and verification system that would assess the actual savings of the project and help to negotiate the terms of the contract.

Once the proposal was finalized and awarded, NAVFAC Far East took the lead to manage design and construction by the contractor. NORESKO will provide operational oversight and major equipment overhauls of the plant and show proof of its savings for the next 20 years.



A new 39 megawatt cogeneration plant meets all power requirements for Commander Fleet Activities Yokosuka, Japan while cutting emissions.



This project represents significant progress toward the Navy's energy efficiency goals. CFAY is expected to save 582 billion British thermal units per year (BBtu/yr), as well as eight million gallons of liquid fuel, with the decommissioning of an existing steam plant.

“The steam generation capability of the new plant allows us to demolish one of our three steam plants while still meeting base steam load requirements,” said Rankin. This will free up the site for construction of a future barracks to house shipboard sailors under the Homeport Ashore initiative.

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Decentralized Pumping System Technology

Current energy-efficient pumping system technology utilizes variable speed pumps located at a central location with two-way control valves installed at the coils (Figure 1). The function of the control valves is to regulate water flow through the coils by creating water pressure drops across the valves. Similar to electric resistance in the electrical circuit, the control valves are the source of both power and energy losses in the pumping system.

An innovative decentralized pumping system utilizes a variable speed pump installed at each coil (Figure 2). The decentralized pumps circulate and regulate water as required through the coils and piping system without the control

valves. Pump energy overcomes only the essential piping and equipment losses. Compared with the present technology, the system has the potential to reduce energy consumption from 30 to 50 percent in a large pumping system.

A full article about the decentralized pumping system is available in ASHRAE Journal September 2000. For more information, please contact Somchai Paarporn, P.E., Bureau of Engraving and Printing, at Somchai.paarporn@bep.treas.gov or 202-874-3749.

References: Somchai Paarporn "Local Pumping System" ASHRAE Journal September 2000. Somchai Paarporn "Decentralized Pumping System" U.S. patent no. 6,607,141.

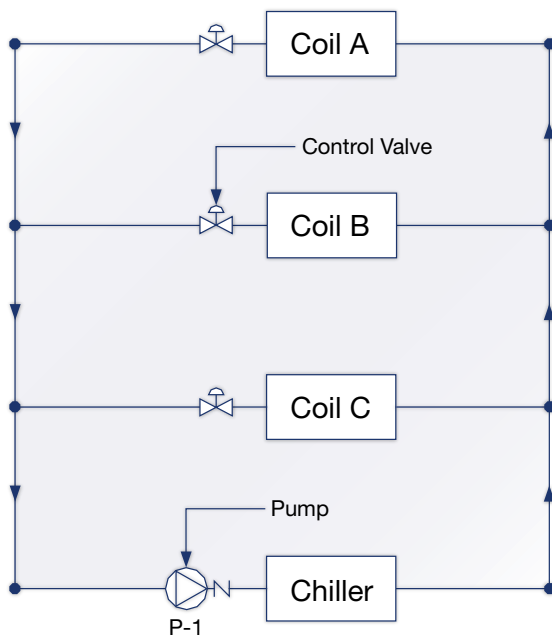


Figure 1: Present Technology Pumping System

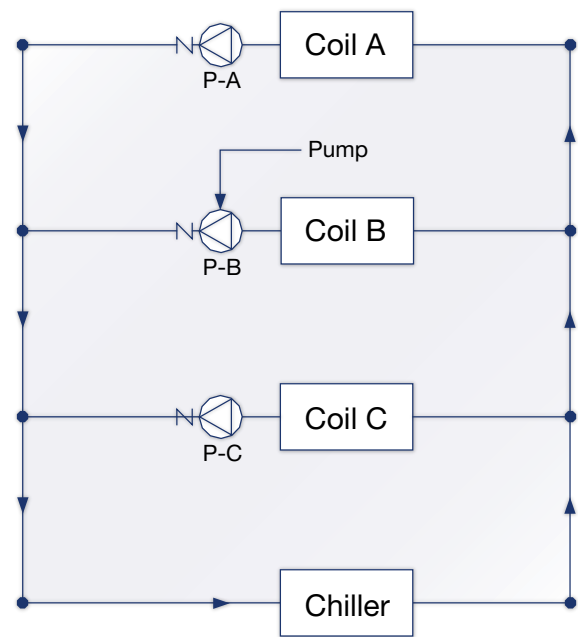


Figure 2: Decentralized Pumping System

FEMP HOLDS SUCCESSFUL FEDERAL AGENCY-ESCO FORUM (Continued from page 6)

- Stepping up efforts to further streamline and improve the ESPC development process.

Additionally, feedback from the agencies and ESCOs revealed an interest in continuing these discussions on a quarterly basis. FEMP is considering using the successful bi-annual model of the Federal Utility Partnership Working Group meetings, which are attended by Federal agency representatives and utilities that have Utility Energy Service

Contract (UESC) programs or are interested in developing UESC programs. FEMP will hold meetings quarterly beginning in August. Highly focused initiatives such as this Forum, Super ESPC workshops and Webinars, and other Super ESPC project development and implementation support improvements will result in successful Super ESPC projects that help agencies save energy and costs, reduce pollution, and meet their mandated goals.

For more information, please contact Ab Ream, FEMP, at ab.ream@ee.doe.gov or 202-586-7230.

Continuing Technical Assistance Available from DOE's National Laboratories

The Department of Energy's (DOE) national laboratories conduct research and development (R&D) essential to DOE's mission and provide technical assistance to many DOE programs. With DOE approval, the labs can use authorized funds to support other agencies.

FEMP is expanding DOE's laboratory support to agencies to provide technical advice through its 2009 Call for Technical Services (now closed).

To engage the labs in continuing support beyond the initial FEMP support, Federal agencies should establish "work for others" (WFO) arrangements with the laboratories. WFO agreements allow DOE to provide research and technical assistance to agencies, and are fully-funded by the requesting agency. The objectives of WFO are to provide assistance and aggregate resources to accomplish goals of national concern that may otherwise be unattainable to agencies, and to provide access to highly specialized or unique facilities, services, and technical expertise. Parameters of WFO are:

- WFO may be either R&D or non-R&D services.
- Work must be consistent with the mission and/or special expertise of the DOE laboratory or technology center.
- Work must not affect the achievement of DOE work requirements.

- Work must not directly compete with the domestic U.S. private sector.

If agencies are receiving initial assistance using FEMP services, FEMP strongly recommends that agencies have WFO agreements in place prior to the exhaustion of FEMP funds so that support may continue seamlessly. FEMP will assist agencies in setting up these WFO agreements as needed.

DOE's National Laboratories

- Argonne National Laboratory - www.anl.gov
- Idaho National Laboratory - www.inl.gov
- Lawrence Berkeley National Laboratory - www.lbl.gov
- National Energy Technology Laboratory - www.netl.gov
- National Renewable Energy Laboratory - www.nrel.gov
- Oak Ridge National Laboratory - www.ornl.gov
- Pacific Northwest National Laboratory - www.pnl.gov
- Sandia National Laboratory - www.sandia.gov

To learn more about working with DOE's national laboratories and for a listing of laboratory contacts and core competencies, please visit http://www.femp.energy.gov/features/working_with_doelabs.html.

Final Rule Issued for Federal Procurement of Energy Efficiency Products

The Department of Energy's (DOE) Federal Energy Management Program (FEMP) issued a final rule covering the Federal procurement of energy efficiency products. The rule is recorded in the Federal Register for Friday, March 13, 2009 (Volume 74, Number 48).

The final rule updates 10 CFR Part 436. It establishes guidelines for Federal agencies regarding the implementation of amendments to the National Energy Conservation Policy Act (NECPA) that require the procurement of ENERGY STAR®-qualified and FEMP-designated products in procurements involving energy-consuming products and systems.

The final rule includes changes in response to comments from the June 19, 2007 notice of proposed rulemaking. Most notably, the final rule does not establish a reporting requirement, as initially proposed, for Federal agencies under procurement requirement of NECPA.

The final rule is effective April 13, 2009.

For more information, please contact Cyrus Nasser, FEMP, at cyrus.nasser@ee.doe.gov or 202-586-9138.

Wind Power Drives Fuel Savings for the Air Force

Given their remote locations and bone-chilling winter temperatures, U.S. Air Force Cape Lisburne, Cape Newenham and Cape Romanzof Long Range Radar Sites (LRRSs) in Alaska have extraordinarily high operating costs, especially with the high costs of the diesel fuel needed to generate power. To reduce these costs, 611th Civil Engineer Squadron (CES) engineers used data obtained and experiences gained from the construction of a prototype hybrid wind-diesel power generation system at Tin City LRRS, the first at an Alaskan air base and within Pacific Air Forces. The prototype at Tin City laid the foundation for the development of the three additional hybrid power generation system projects to be constructed. The wind turbine generators at the three sites will be wind-diesel hybrids that, when operational, will augment the sites' current diesel-only power production systems.

"This important milestone for the 611th Air Support Group (ASG) is the largest renewable Air Force energy project in Alaska and is very timely, given the cost of fuel," said Col. Brent Johnson, 611th ASG Commander, Elmendorf AFB, Alaska. "Wind generation should decrease our annual fuel consumption when operating under optimal conditions at these sites by approximately 50 percent and save \$9.6 million over their 20 year life cycle. It should also decrease greenhouse gas emissions."

A \$14.1 million award through the 2009 American Recovery and Reinvestment Act (ARRA), designed to stimulate the American economy, create and save jobs, and build the foundation for long-term economic growth funded the project. The funds are being distributed through the Energy Conservation Investment Program, a Department of Defense (DoD) Military Construction initiative for projects that save energy or reduce defense energy costs. The Air Force fully supports the Administration's commitment to invest ARRA dollars, allowing DoD and the Air Force to continue to lead the way in the national effort to achieve greater energy independence. The ARRA includes approximately \$7.4 billion in defense-related appropriations, which accounts for less than 1 percent of the total \$787 billion stimulus package. The Air Force will receive roughly \$1.7 billion dollars of the allotted DoD funds.

Energy available for conversion by a wind turbine is measured as wind power density, and the western coast of Alaska is in a class seven wind power density zone, the highest possible category. According to the 611th CES energy management section, the average wind speed at these sites ranges from 9.4 to 17.5 miles per hour, but during testing some sites sustained winds of up to 83 miles per hour (equivalent to a category 1



Dwarfing its surroundings, the wind turbine sits east of the Tin City LRRS.

hurricane). Although this is not often a continual 83 miles per hour, this variance in wind speeds illustrates the ever-changing, extreme conditions at the site.

An engineering model combining wind density and energy production data estimates potential annual savings of \$600,000 in energy costs per dual system installation at each site. The digital control system installed with the turbine allows for more precise control of the existing diesel generators; diesel power production complements wind production, and operators can completely shut down diesel generators when the wind strength is sufficient to power the site. Fuel usage at the site is minimized and the resulting reduction in diesel generator run time is estimated to save \$10,000 annually in decreased generator maintenance costs. With the reduction in fuel consumption, the return on investment should be realized within about seven and a half years.

There are a number of challenges that will be faced with constructing wind turbines at Alaskan coastal sites, including tremendous icing, changing weather conditions, and wind patterns. The construction and installation contractor for the Tin City system, an Alaskan Native corporation, has extensive experience with cold weather wind generation, and worked together with the 611th CES engineers to develop a cutting-edge cold weather package to meet the unique needs of such a harsh environment. A similar package is planned for installation at the three cape locations.

For more information, please contact Tommie Baker, Community Relations Coordinator, 611th CES, Elmendorf Air Force Base at tommie.baker@us.af.mil or 907-552-4506.

NAVY COGENERATION PLANT PROVIDES CLEAN ENERGY, SAVES COSTS, AND SUPPORTS MISSION READINESS

(Continued from page 7)

By providing electricity to CFAY, the cogeneration plant supports fleet deployments while simultaneously decreasing the output of carbon dioxide by 22 percent, sulfur dioxide by 80 percent, and nitrogen oxide by 47 percent.

The Cogeneration Solution

Cogeneration, or combined heat and power, is an efficient method of preventing heat waste. Rather than venting the heat generated by the production of electricity, the heat is typically diverted for such uses as heating, cooling, and dehumidification. This process displaces fossil fuel combustion with otherwise lost heat and, because the electricity is generated near the point of use, there is less transmission loss than electricity provided by nearby power plants. Overall, the cogeneration process is more than twice as efficient as the average U.S. fossil fuel power plant.

“The new cogen plant solves a number of the Navy’s vital energy needs,” said NAVFAC ESC Commanding Officer Captain Gregory J. Zielinski. “First, it provides significant cost savings and energy to the fleet. Second, it will save millions while providing huge reductions in greenhouse gases and other potentially harmful emissions damaging to our environment.”

There were several engineering challenges to overcome. To support the new three-story power plant facility, the foundation required 30-foot pilings. To interface with the local electric grid and handle megawatt-size power swings without interruptions in power, a sophisticated Supervisory Control and Data Acquisition (SCADA) system was needed, but PWD Yokosuka and NORESKO met the challenges and finished the construction on time for CFAY.

The plant will deliver reliable electrical power to meet the Navy’s utility demands and increased capacity needs, even if a single turbine fails or is shut down. Because of this advanced technology, the plant is expected to greatly increase energy efficiency at CFAY.

Energy Reductions and Environmental Benefits

The cogeneration plant was completed within the three-year scheduled timeline. It has produced exceptional cost savings, lowered environmental impact, and delivered to CFAY overall benefits including:

- **Major Cost Savings:** Savings of \$358 million over the life of the contract. These savings will be used to pay all project-related expenses with no additional cost to the government.

- **Firm System Capacity:** Increases 50-Hz capacity by 35 percent and increases total system capacity by 39 megawatts. This is the equivalent of generating energy for 26,000 homes.
- **Energy Reduction:** Conserves 582 BBtu/yr and eight million gallons of liquid fuel annually.
- **Outstanding Reliability:** Meets capacity even if a turbine fails or is shut down, and provides emergency power operation when needed.
- **Superior Performance:** Pays for services such as operations, maintenance, repair, and replacements from cost savings, worth approximately \$5.5 million per year.
- **Lower Pollutants/Emissions:** Reduces carbon dioxide by 62 ton/year, sulfur dioxide by 871 ton/year, nitrogen oxide by 234 ton/year, and particulate matter by 93 ton/year.

NORESCO will maintain the plant for the 20 year-term, throughout which the plant will undergo regularly scheduled equipment overhauls. These overhauls will insure that the plant is functioning at optimal capacity when the Navy takes over full operation upon the expiration of NORESKO’s contract.

Since its debut, the project has exceeded expectations. The cogeneration plant, as promised, has provided continuous power and substantial energy savings to CFAY, reducing the Navy’s carbon footprint while supporting mission readiness for decades to come.

For more information, please contact Jim Heller, Director, Energy Programs Divisions, NAVFAC ESC, at james.heller@navy.mil or 805-982-3486.

VA Medical Center Uses UESC to Implement Commissioning Project

Through a joint effort, the Veterans Affairs (VA) Medical Center Omaha, located in Omaha, Nebraska, and Energy Systems Laboratory (ESL) at the University of Nebraska, implemented a commissioning project using a utility energy services contract (UESC) with their serving utility, Omaha Public Power District (OPPD). The Federal Energy Management Program (FEMP), through team members at the National Renewable Energy Laboratory, provided technical assistance to OPPD and the VA Medical Center in the award of the UESC.

Continuous commissioning service was the primary energy conservation measure implemented through the UESC, along with control systems upgrades and continuous training, allowing the VA staff to optimize energy usage and operation throughout the entire facility. As a result, the facility's reliability, safety, comfort, and operation are significantly improved, and the Medical Center occupants benefit from markedly enhanced levels of comfort in their environment. The operations staff is experiencing unprecedented peace of mind, as the equipment now never has to run at its maximum speed or full capacity.

The VA energy team is reaping additional benefits now that the project is significantly reducing energy consumption

and costs. Since project completion in fiscal year 2008, the VA facility's energy index is already approaching the Federal energy reduction requirement. The energy costs have been reduced by more than \$200,000; even higher than anticipated.

The VA Nebraska Iowa Medical Center project in Omaha will serve as an example for other VA hospitals in the region, and possibly nationwide.

For more information, please contact David McAndrew at david.mcandrew@ee.doe.gov or 202-586-7722.



VA Medical Center Omaha, Omaha, Nebraska

Pacific Gas & Electric Hosts UESC Workshop and Strategic Partnership Meeting

The Federal Energy Management Program (FEMP) and Pacific Gas and Electric (PG&E) hosted a Utility Energy Services Contract (UESC) Workshop at PG&E in San Francisco on April 1-2, 2009. Sixty-three participants attended the 1-1/2 day workshop. Following the workshop, PG&E representatives, led by Chris Gillis, provided a briefing on PG&E services available to Federal customers. The workshop provided attendees with an overview of UESC contracting options and local utility services available to engineer, finance, and install cost-effective energy and water savings.

FEMP Workshop instructors included: David McAndrew (FEMP Utility Program), Karen Thomas (National Renewable Energy Laboratory), Julia Kelley (Oak Ridge National Laboratory) and Millard Carr, Energy Management Solutions. In addition, Bruce Gross of Dominion Federal Corporation and Ed Thibido of the U.S. Navy were guest instructors for financing and contracting (respectively).

In conjunction with this workshop, FEMP and the Bay Area National Parks held a Strategic Partnership Meeting with PG&E on April 3. Joe Konrade, FEMP customer service representative for the National Parks Service, and David McAndrew organized this meeting along with Steve Butterworth, Shawn Norton and Laura Castellini of the National Parks Service. The 34 attendees of the follow-on meeting heard presentations covering FEMP services, opportunities for biomass projects, and available utility services. The meeting focused primarily on determining next steps for a comprehensive look at project opportunities for national parks in the San Francisco Bay area. As a next step, PG&E will conduct energy audits at these parks.

For more information on UESC Workshops or to discuss agency-specific training opportunities, please contact David McAndrew at david.mcandrew@ee.doe.gov or 202-586-7722.

Labs21 Updates Environmental Performance Criteria for Laboratories

Under Executive Order (EO) 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, Federal agencies are required to reduce energy intensity by 3 percent annually through the end of FY 2015, leading to 30 percent by the end of FY 2015, relative to an FY 2003 baseline. This requirement includes laboratories and industrial facilities, which face unique challenges in meeting energy intensity reduction goals. For example, the typical laboratory uses far more energy and water per square foot than the typical office building due to intensive ventilation requirements and the mitigation of other health and safety concerns.

Agencies with laboratory facility responsibilities are encouraged to participate in the Laboratories for the 21st Century (Labs21[®]) program, supported jointly by the Environmental Protection Agency and the Department of Energy. The program offers laboratory facility managers guidance and tools that substantially can aid Federal energy managers in meeting the energy efficiency goals for new and existing laboratory facilities.

One of these tools is the Labs21 Environmental Performance Criteria (EPC), a rating system specifically designed for laboratory facilities. Produced by a series of working groups that included more than 40 architects, engineers, facility managers, and health and safety professionals, the EPC builds on the Leadership in Energy and Environmental Design (LEED[®]) Green Building Rating System developed by the U.S. Green Building Council. Simply striving for a LEED rating may not ensure that a laboratory facility will achieve the energy reductions required by executive order. Therefore, the EPC is consistent with the format of LEED and retains many of its valuable measures, but adds extra pre-requisites and criteria specifically for laboratories.

The EPC was recently updated to version 2.2 and is available for viewing and download from the Labs 21 Web site at <http://www.labs21century.gov/toolkit/epc.htm>.

For more information, please contact William Lintner (DOE) at william.lintner@ee.doe.gov, 202-586-3120 or Karen Murray (EPA) at murray.karen@epa.gov, 202-564-2539 and visit the Labs21 Web site at <http://www.labs21century.gov>.

Fall 2009 Energy Training and Certification Opportunities

Solar Energy International

PV100.OL: PV Design Online (a six-week online course in photovoltaic design)

September 14 - October 25, 2009

<http://www.solarenergy.org/workshops/pvdesignonline.html>

ESPC Comprehensive Workshop (based upon the new DOE IDIQs)

September 15-17, 2009

Sacramento, California

<http://www.femp.energy.gov/news/events.html>

Association of Energy Service Professionals

Introduction to the Principles of Demand-Side Management Workshop

September 15-17, 2009

Albany, NY

<http://aesp.org/cde.cfm?event=256548>

Association of Energy Service Professionals

Fall Technology, Smart Grid, Demand Response & Energy Efficiency Conference & Expo

October 5-7, 2009

Milwaukee, WI

<http://aesp.org/cde.cfm?event=246962>

Ventilation 2009, the 9th International Conference on Industrial Ventilation

Clean Industrial Air Technology Systems for Improved Products and Healthy Environments

October 18-21, 2009

Zurich, Switzerland

<http://www.ventilation2009.ethz.ch/>

Lean & Green: RSES Annual Conference

October 27-31, 2009

Minneapolis/St. Paul, MN

<http://www.rses.org/conference>

ISHVAC 2009, the 6th International Symposium on Heating, Ventilating and Air Conditioning

November, 6-9, 2009

Southeast University, Nanjing, China

<http://www.ishvac09.org.cn/hcfm?ItemNumber=23652>

Greenbuild 2009

November 11-13, 2009

Phoenix, AZ

<http://www.greenbuildexpo.org>

Labs21 2009 Annual Conference



HAS TRYING TO GO GREEN MADE YOU BLUE?

ARE YOU LOOKING FOR WAYS TO SAVE money on your high-tech facility's utility bills? Are you struggling to meet federal requirements such as those issued in the Energy Independence and Security Act of 2007? Or are you simply trying to do your part to create a more sustainable building? The International Institute for Sustainable Laboratories (I²SL) can help you find the answers to these questions and more.

Meet and interact with a community of laboratory architects, engineers, builders, owners, and other high-tech building professionals in September 2009 at the Laboratories for the 21st Century (Labs21®) 2009 Annual Conference. The event, co-sponsored by I²SL, offers a forum for facility professionals like you to discuss the challenges and trends in energy-efficient and environmentally sustainable high-tech facility development. Visit the I²SL Web site for the latest details: <www.i2sl.org/labs21/conference/conference.html>.

Indiana Convention Center
Indianapolis, Indiana
September 22–24, 2009

Exhibitor and Conference registration is now open!

www.i2sl.org

Get regular updates on these and other exciting activities coming from I²SL in 2009. E-mail labs21@i2sl.org to receive I²SL's new E-newsletter, the *Sustainable Laboratory Times*, or visit I²SL's Web site for more information: <www.i2sl.org>.



The Labs21 program is co-sponsored by the U.S. Environmental Protection Agency and U.S. Department of Energy. I²SL has been selected as the official co-sponsor for the Labs21 2009 and 2010 Annual Conferences and Workshops.

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