

Western's monthly energy efficiency and renewable energy newsletter dedicated to customer activities and sharing information on energy services.

Ft. Carson sustainability program honors Western employee for support

One of the most satisfying things about being a Western Energy Services specialist is supporting a customer program that sets the standard for environmental leadership, like the Fort Carson Sustainability Program. When such a customer recognizes Western's contribution to its efforts, it holds special significance.

Rocky Mountain Energy Services Specialist Peggy Plate received the Excellence in Sustainable Resources award at the Army base's Fifth Annual Community Sustainability Conference and Expo, Nov. 8, in Colorado Springs.

"Peggy's efforts increase our ability to sustain facility energy from renewable sources and reflect great credit on herself, Western and Fort Carson," said Colonel James Balocki, when he presented her with the award at the Nov. 8 Ice Breaker dinner.

The award encompasses two different projects—one for Fort Carson to purchase renewable energy certificates through Western's Renewable Resources for Federal Agencies and the other to bring a large photovoltaic system to Fort Carson.

"Fort Carson has a goal to be 100 percent renewable by 2030," said Plate. "The base is one of the leaders in sustainability, particularly in the Army. Western should be proud to be a part of Fort Carson's success."

Renewable successes

With its five-year contract through Western to purchase 40,000 MWh/year of RECs from wind and biomass energy, Fort Carson now gets 28 percent of its power from renewable resources. "More, if you count our hydropower allocation from Western," said Utility Programs Manager Vince Guthrie, who nominated Plate for the award.

A passive solar collector wall on a large motor pool building and some solar-powered street lights and signs add a few more kW toward the base's ultimate goal, Guthrie noted, but the 2-MW PV array Plate is coordinating will be the base's first major solar project. The system will provide only a small amount of non-firm renewable energy, but it is groundbreaking in its location—a former landfill Fort Carson is donating.

"These sites have to be closed out according to strict environmental regulations, so the opportunities for reuse are very limited," explained Susan Galentine, spokesperson for Ft. Carson's Directorate of Environmental Compliance and Management. "It's a big accomplishment to give a landfill a second life for a sustainable purpose."



The SolarWall panels Fort Carson installed on a vehicle maintenance building improve ventilation and save energy costs. (Photo by Fort Carson)

Fort Carson will receive the non-firm energy, and the green tags will be sold to Xcel through its renewable energy program. An added benefit, according to Plate, is the number of people who will learn more about renewable energy because of the project. "This provides an opportunity to educate a large number of military people who spend at least some portion of their career on this base," she explained.

Community helps

The renewable energy goal is one of 12 sustainability goals identified at Fort Carson's first regional conference in 2002. "We invited community leaders, representatives from potential partner organizations and interested individuals," said Galentine. "More than 200 people attended the first Community Sustainability Conference, and the event gets bigger every year."

Attendees at the first conference listened to presentations by sustainability experts, and then broke up into workshops and committees. The

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goals and ideas the groups generated became Fort Carson's Sustainability Program, a 25-year plan to protect the land, water and air resources of the installation and surrounding community.

Some Sustainability Program initiatives and projects, like the REC purchase, have produced quick and encouraging results. "We've had a lot success on the utility side," said Fort Carson Sustainability Planner Hal Alguire.

Since 2000, Fort Carson's total water use has decreased by 45 percent despite an increase of more than one million square feet of new construction. "Irrigation is 50 percent of our use, so installing rain sensors and minimizing turf areas has had a big impact," said Guthrie.

Galentine pointed out that Fort Carson's commitment to water conservation predates the Sustainability Program by many years. "The Central Vehicle Wash Facility, built in 1990, saves 150 to 200 million gallons per year by washing all military vehicles with recycled wastewater. Water conservation is central to sustainability in a semi-arid climate like ours," she added.

Energy Services Bulletin

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Long-term process

Vision and long-term planning are also critical to Fort Carson's Sustainability Program. "We've made some great strides, but fostering sustainable patterns and development takes time," said Alguire. "It takes a master plan that you have to follow over the long haul."

With a military installation, he continued, that means providing land for training exercises. "Training soldiers is Fort Carson's function, and encroachment on our borders hurts our ability to do that," the planner explained.

In partnership with The Nature Conservancy, Fort Carson funded acquisition of conservation leases on 56,000 acres of private land and acquired permanent conservation easements on 12,000 acres on its southern and eastern boundary. El Paso County joined TNC and Fort Carson for a 15-parcel acquisition of five-acre, undeveloped lots on the county's eastern boundary. The partnership initiated another acquisition of 44 additional parcels last year.

Preserving open space for training is not the only challenge Fort Carson must address in its master plan. The Army's Base Realignment and Closure process will bring new military units, soldiers and their families to the area, all requiring housing and facilities. Future development will incorporate smart growth principles and strategies, and green building practices to meet those needs in a sustainable fashion.

Partnerships a must

An ambitious plan like Fort Carson's Sustainability Program takes teamwork—not only among

base personnel but with the wider community. It is not surprising that four of the program's 12 goals involve internal training or public outreach. "Our stakeholders e-mail list keeps growing," acknowledged Galentine.

As the program's annual report puts it, "partnering with organizations outside the fence line" is increasingly crucial to Fort Carson's ability to prepare soldiers and military units for deployments, while embracing sustainability. Locally, Fort Carson initiated the Pikes Peak Sustainability Indicators Project with the Pikes Peak Area Council of Governments. The project involves counties, municipalities and other stakeholders in tracking long-term trends for select quality of life measures. Another partnership with the University of Colorado at Colorado Springs is helping both organizations integrate sustainability concepts into their development and operations.

On the national level, the U.S. Environmental Protection Agency named Fort Carson one of the Top 10 Federal Green Power Partners in 2006. "Our relationship with Western made that distinction possible," said Alguire.

Plate, in turn, is quick to credit the Renewable Resources for Federal Agency team. "We had a lot of people who helped in the purchase and process," she said.

She also admits to being excited about receiving Fort Carson's Excellence in Renewable Resources award because, "This is what I do—customer service. But the biggest honor is being a part of Fort Carson's success," she added. ⚡

Want to know more?

Visit www.wapa.gov/es/pubs/esb/2007/jan/jan071.htm

Luke AFB takes energy efficiency to new heights

This story is based on an article written by Honeywell Solutions for Military Engineer.

NOTE: Energy Services Bulletin welcomes stories written by or about Western customers. Contact Kevon Storie if you would like to submit a story about your utility's programs or services.

The U.S. Air Force sets a high bar for environmental stewardship through efficiency measures and renewable energy purchases, even earning a Green Power Leadership Award in 2005 for its role in advancing green power and furthering the growth of the renewable energy market.

Determined to contribute to this success, Western customer Luke Air Force Base, near Phoenix, Ariz., launched an aggressive and innovative energy conservation program. The base's efforts to increase its energy efficiency and comfort make a compelling case for savings through equipment upgrades and maintenance.

Retrofit program established

In January 2006, Luke began an energy retrofit program as part of a \$13.8-million energy savings performance contract with Honeywell.

Luke had previously completed traditional, smaller-scale conservation projects, but aging and inefficient equipment continued to be a drain on the base's utility budget. Because Luke's utility budget falls under its general operations budget, high utility bills ate into the funds available for costly, but necessary, upgrades. The performance contract broke the vicious cycle, freeing the base to address deferred maintenance issues and implement significant facility upgrades.

Under the contract, energy savings resulting from the upgrades go toward paying for the program. The savings are guaranteed, so the work—including infrastructure improvements, a renewable energy installation and long-term preventive maintenance services—won't raise budgets or tap into additional taxpayer dollars. "The project's innovative approach allowed us to make necessary improvements to our base exchange and address mandated energy savings," said former Luke Energy Manager John Li. Li is now the Energy Services representative for Western's Desert Southwest regional office.

Base-wide commitment

The retrofit program is a joint effort between Luke's Civil Engineering and Contracting squadrons. The scope of the project made gaining support from all areas within the base critical to success. Luke assembled its project team around the right mix of expertise and experience to reflect the project's broad impact and size.

In addition to engineers and technicians, the cross-functional team included representatives from areas such as upper management and the finance department. Overall, the base's integrated approach helped to ensure smoother scheduling, faster approval processes, improved work quality and lower administration costs.

When forming the work plan, Luke considered and compared all building systems and operations to identify areas with potential energy savings opportunities. The



The Luke Air Force Base Exchange Building now boasts the Air Force's largest integrated photovoltaic roof system, thanks to an energy savings performance contract. (Photo by Luke Air Force Base)

resulting upgrades mix traditional and renewable conservation measures to meet required Federal mandates and improve efficiency. The improvements affect more than 100 buildings across the base, with solar, lighting, HVAC and building control systems, and water treatment and conservation upgrades. Combined, the improvements are expected to generate savings of \$21.8 million in energy and operational costs over the next 20 years.

Savings from the sun

A 144,000-sq. ft. integrated photovoltaic roof system at the Base Exchange Building is central to the project. The building, a prime spot for commerce and activity, was covered by an old, leaky roof that threatened thousands of dollars worth of inventory. With the help of performance contract financing, Luke was able to take on the large capital investment required for a new roof that includes integrated solar technology.

Installed in two phases, the new roof is the largest integrated solar roof at an Air Force facility. It provides the base with more than 370 kilowatts of free, zero-emission power — enough

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energy to power more than 100 homes per year. In addition, Arizona Public Service, the local utility, will provide a \$1,488,000 rebate to help pay for the system. APS will be able to count the power the system generates toward the state's renewable portfolio standard.

This renewable energy measure improves Luke's control over its energy use and spending, while helping to meet Federal renewable energy mandates. By generating its own electricity, Luke lessens its dependence on the electric grid and fossil fuels, tapping the limitless energy supply from the hot Arizona sun. Also, the solar technology helps to offset electricity use during peak times, when demand and prices are highest.

Centralized control

The roof is tied into a new energy management control system, which runs on Luke's current local-area-network-based building automation platform and provides more centralized control for buildings and equipment. The system connects an automated metering device to the roof, allowing base personnel to demonstrate and track electricity production in real time.

The energy management control system also includes base-wide HVAC equipment. HVAC is critical for maintaining comfort and productivity at the base, where the average summer temperature is well above 100 degrees. Previously, checking on the operating status of a building's systems required dialing the building's specific modem. With the new

system, staff can access the entire network of building systems from a single point to adjust temperature setbacks or investigate the operating status of a specific boiler, saving time and money while reducing equipment strain and run-time.

Lighting for efficiency

Another part of Luke's energy-efficiency mix is new fluorescent lighting, which is 70 percent more efficient than the old lights. The light fixtures are tied in with a control system to take advantage of natural lighting when possible.

The old lighting system consumed more power and had a shorter life, causing more frequent, sometimes labor-intensive replacements that had to be coordinated with other base operations. Scheduling difficulties often led to dimmer light levels and less-than-optimal working conditions in areas such as hangars. The new, more powerful lighting will last longer and provide substantial savings opportunities, from both maintenance and equipment replacement.

Like lighting, water conservation measures can have a big impact on a facility's efficiency. Low-flow sinks, toilets and fixtures will help reduce base water consumption by millions of gallons each year.

Maintenance is key

Harsh desert weather can wreak havoc on water treatment systems, including chilled-water and air conditioning units. These units, which are critical to keeping Luke cool in the heat, require adequate, routine maintenance to halt deterioration and ensure they are operating efficiently.

Luke performed an overhaul of more than 150 of its mechanical systems, scrubbing and replacing various parts. As a result, the base has seen a 20-percent improvement in the efficiency of its industrial water treatment system.

The role of maintenance in maintaining efficiency is significant. Without regular maintenance, systems quickly lose their efficiency and require a substantial investment to restore the quality of their working parts.

Luke has implemented a daily maintenance schedule, with two full-time maintenance staff members who perform daily services and inspect water treatment systems. The base has automated analysis of its critical systems by installing advanced measurement and metering devices, which report on system efficiency and performance. The work, all part of long-term preventive maintenance services under the performance contract, ensures the daily maintenance necessary to keep systems up and running optimally.

Green measures

Less than a year into its performance contract, Luke is already realizing substantial energy and cost savings. The base continues to explore other renewable and sustainable ideas with Honeywell, including methods to incorporate biomass, to generate more "green" savings. Thanks to the project's innovative financing approach, Luke is achieving the seemingly impossible—leveraging a no-risk solution to maximize base comfort, meet stringent conservation requirements and lower energy costs. ⚡

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2007/jan/jan072.htm

Western workshops prepare for demand-side management revival

In the utility industry, as in fashion, what goes out of style will be back someday. Demand-side management, “that ‘70s program,” is starting to look like a hot new idea for dealing with rising energy costs and less reliable supply sources. That’s why Western’s Energy Services is presenting a workshop Jan. 24 to help utility staff who are new to DSM, or who need to reenergize their program, develop effective DSM strategies.

Second in series

“How to Plan and Implement Demand Side Management Programs” will take place at Tri-State Generation and Transmission Association headquarters in Westminster, Colo., from 8 a.m. to 4 p.m. “This event is for utilities that are already committed to DSM but lack experience designing and implementing programs,” said Energy Marketing Consultant Ed Thomas.

Thomas, who has designed marketing programs for Delta Montrose Electric Association and Intermountain Energy, is working with Energy Services to produce a series of DSM webinars and workshops. “The Nov. 14 webinar, ‘Introduction to Demand-Side Management,’ made the case for why utilities should do DSM,” he continued. “Like the title says, the Jan. 24 workshop is the ‘how-to.’ Utility staff who are responsible for integrated resource planning and program implementation will really benefit from the material we’ll cover.”

“Western’s goal with this workshop is to ‘re-introduce’ demand-side management to our firm power cus-

tomers,” said Mike Radecki, Energy Services representative for Western’s Upper Great Plains region.

Radecki and Rocky Mountain Regional Energy Services Representative Peggy Plate will serve as moderators for the workshop session, “Launching and Reenergizing Your DSM Programs: Identifying Next Steps and Program Resource Needs.”

Learning from experience

Other highlights of the daylong workshop include:

- How DSM Can Meet Your Load Objectives
- Getting Management Buy-In: The Drivers to Develop and Implement DSM Programs
- Do the Math: Calculating and Articulating the Value of DSM
- Roundtable Discussion of DSM Challenges

Specific measures, such as water heater control, are not the focus of this particular event, Thomas said. “We talked with a lot of utilities, and we kept hearing that people were most interested in the big picture—how to sell DSM to the board, how to track results,” he explained. “They want the chance to talk to organizations that have had experience with DSM.”

Representatives from utilities with successful DSM strategies, as well as from utilities that are still developing their programs, will share best practices and lessons learned.

Participants will also learn how technology has changed since the early days of DSM and how methods for projecting, measuring and evaluating program effectiveness have

improved. “While DSM programs have been in existence for many years, there are new evaluation tools and concepts to help utilities to determine which DSM activities will work best for their unique circumstances,” said Radecki.

The speakers hail mainly from Western’s territory and from utilities similar in size to those the participants represent. “We looked for presenters who could offer replicable experiences,” Thomas said.

Growing call for DSM

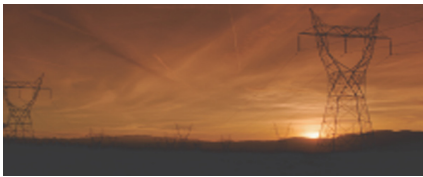
Response to the first webinar bears out that strategy. Energy Services Representative Dave Opsahl from Western customer Wilmar Municipal Utilities gave a presentation explaining how demand-side management benefited his utility, and, “Ever since, people have been calling to find out more about our program,” he said. “The webinar generated all kinds of interest.”

Radecki pointed out that the interest already exists to a large extent, which is why Energy Services is producing the DSM education series. “A lot of factors have come together to create this need for utilities to look at ways to get more control of their loads,” he said. “We are bringing together the resources to help them do it.”

Those factors come from a variety of directions, according to Thomas. Customers are anxious about rising utility bills. Generation and transmission entities face legislative mandates and community pressures to explore

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Want to know more?
Visit www.wapa.gov/es/pubs/esb/2007/jan/jan073.htm



TOPICS from the POWER LINE

Consider cost in determining most effective level of insulation

Editor's note: The Energy Services Bulletin features real answers to real questions posed to our staff at the Energy Services Power Line. We hope you find it useful.

Question:

How much insulation can be installed in a roof before the weight of the insulation causes it to compress to the point where it is less effective?

Answer:

We posed your question to industry expert Daniel Lea at the Cellulose Insulation Manufacturers Association. Here is his response:

Compression of the insulation is not the issue. Adding more insulation in an attic environment will always increase its installed R-Value. The question is at what point does the cost (financial and invested energy) of the additional insulation enter the negative return range. Based on an analysis by Oak Ridge National Laboratory, the Department of Energy determined that, in most of the United States, that point is R-49. In near arctic climates, DOE ups this to R-60.

It is important to note that the point of diminishing returns will vary by the cost of the insulation product, the cost of fuel to heat or cool the building, and the temperature range of the environment (both indoor and out).

Additional Information

- *Standard Practice for Installing Cellulose Building Insulation* (56K Adobe® Acrobat® .pdf): CIMA Technical Bulletin.
- *"Insulation"*; DOE Building Technologies Program. Basic information about insulation.
- *DOE: A Consumer's Guide to Energy Efficiency and Renewable Energy*
- *"Estimating the Payback Period of Additional Insulation"*: This webpage provides an equation to estimate the cost effectiveness of adding insulation in terms of the "years to payback" for savings in heating costs.
- *"Loose Fill Insulation"*: This covers different types of loose fill insulation, recommended specifications and installation tips.
- *"The R-Value of Insulation"*: This contains general information on insulation R-values. ⚡

Workshops

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all options before building new power plants. Distribution utilities want to control the costs they are paying for supplemental power, and, "Utility managers also feel a moral obligation to be better environmental stewards," Thomas stated. "DSM is one of the most inexpensive and effective approaches available to power providers to protect our natural resources."

The Jan. 24 workshop will focus on all of those concerns, and more. "We want everyone to go home with actionable items," said Radecki.

Those DSM issues are not limited to the Rocky Mountain Region, so Western will team up with Missouri River Energy Services to present the workshop on Feb. 27 at MRES headquarters in Sioux Falls, S.D. "This workshop is very timely for MRES and its members," said MRES Energy Services Supervisor Joni Livingston. "MRES is at a stage where it needs additional power supply. DSM is our least-cost resource and we want to promote it as much as possible."

Another follow-up webinar is planned for March. Watch the Energy Services Web site for the date and registration information. "We want to make sure everyone who needs this information has a chance to participate," Radecki said. ⚡

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2007/jan/jan074.htm



Energy Shorts

Energy Services Bulletin now monthly

In the December 2006 issue of Energy Services Bulletin, readers had the opportunity to tell us what they think of the publication and of Energy Services. One thing readers seemed to want was a shorter bulletin more often. Since the New Year is a good time to start a new tradition, here it is—the first issue of the new monthly Energy Services Bulletin.

We agree with you that a more frequent publishing schedule will make it easier for Energy Services to keep you up to date on the rapidly changing issues affecting power providers. The bulletin will still offer in-depth stories on programs, measures and technologies to help your utility keep its competitive edge. Only now, there will be fewer stories, so you won't miss any of the details.

There are some other changes as well. Topics from the Power Line and Technology Spotlight will alternate each month. Energy Shorts will now appear on the former Energy Services news page and both Energy Shorts and the calendar will change more frequently.

Subscribers will continue to receive e-mail notice each time a new Energy Services Bulletin is published. You may want to check your e-mail program or call your IT department to make sure that spam-blocker software

is not filtering out mail from the wapa.gov domain.

Energy Services believes this change will help our customers meet the many surprises and challenges awaiting the utility industry in 2007. As always, we continue to welcome your feedback—and stories.

Solar energy tax credits extended

In its waning hours, the 109th Congress passed legislation to extend the 30 percent solar energy investment tax credit for homeowners and businesses for one additional year.

The Solar Energy Industries Association applauded the one-year extension of the solar ITC in H.R. 6111, the "Tax Relief and Health Care Act of 2006." However, SEIA President Rhone Resch cautioned, "While this bill does not constitute a long-term solar growth policy, it does provide some breathing room for solar projects in the 12- to 18-month pipeline."

An eight-year extension of the ITC will remain the solar industry's top legislative priority in 2007. Such an extension is essential to creating market conditions that allow solar companies to make investments and drive down costs through economies of scale. According to SEIA, a longer duration would also help stimulate the development of large-scale concentrating solar power projects.

Resch expressed optimism that the 110th Congress would enact an eight-year extension as contained in S. 2677 and H.R. 5206, the "Securing America's Energy Independence Act," a bill which gained a bipartisan group of 80 House and 15 Senate co-sponsors this year. "We look forward to working with the next Congress, to craft a comprehensive and effective policy blueprint for a self-sustaining clean energy infrastructure in the United States," he said.

New Federal efficiency standards

The Department of Energy has updated efficiency standards for new federal buildings, complying with new requirements in the 2005 Energy Policy Act.

Under the interim final rule, the minimum efficiency standard for new Federal residential buildings must equal the 2004 International Energy Conservation Code. The minimum standard for new commercial and multi-family high-rise federal buildings equal a 2004 standard set by the American Society of Heating, Refrigeration, and Air-Conditioning Engineers.

The rule also requires new Federal buildings to be designed to be 30 percent more energy efficient than these standards, if it is cost effective over the building's life. If the improve-

See ENERGY SHORTS, page 8

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2007/jan/jan07es.htm

Energy shorts

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ment is not cost effective, designers must evaluate incrementally lesser goals, such as a 25-percent improvement, a 20-percent improvement, etc.

DOE is accepting comments on the interim final rule through Feb. 2, 2007, with the goal of issuing a final rule after that date. However, the interim final rule took effect on Jan. 3. Any Federal building design process that began after that date must comply with the interim final rule.

Green Energy New Mexico

In an effort to spur new renewable energy development in the state of New Mexico, the Coalition for Clean Affordable Energy has partnered with the Regional Development Corporation, an economic development organization in Santa Fe, and Bonneville Environmental Foundation to introduce a new initiative called Green Energy New Mexico.

This program makes it easy for homes and businesses in New Mexico, and visitors to the state, to support local and regional renewable power through the purchase of renewable energy certificates. A minimum of 20

percent of the gross revenues from the sale of green tags through BEF are set aside in a reinvestment fund. The partnership is committing the funds to support the development of new renewable energy facilities in New Mexico.

A carbon calculator on the Web site helps visitors assess their total environmental footprint from electricity, heating, auto travel and air travel. The calculator gives the number of RECs needed to offset their consumption, and cost options by percent. The minimum purchase is two RECs.

Green Energy New Mexico offers two products: Cooler Future, a blend of 99 percent wind and 1 percent solar resources, and Brighter Future, which is 90 percent wind and 10 percent solar. Brighter Future is slightly more expensive because solar power currently costs more than wind power.

All green tags sold through Green Energy New Mexico are Green-e certified. This stringent certification program ensures that a certified renewable energy facility generated the green tag.

Annual EUEC conference

The 10th annual Electric Utilities Environmental Conference will be held at the Westin La Paloma Resort and Spa, in Tucson, Ariz., Jan. 21-24.

Since the first conference in 1995, EUEC 2007 has gained national recognition as a "must attend" technical and networking event. Utility executives and world-leading experts will present 300 technical presentations on clean air, mercury, global warming and renewable energy. Individuals may also submit abstracts for presentations online.

In addition to the technical presentations scheduled in five concurrent tracks Monday through Wednesday, participants may also attend 15 pre-conference workshops covering state-of-art and cutting-edge technologies. Buffet style luncheons and receptions held in the exhibit area provide the opportunity to network with 1,000 conference participants. The exposition showcasing 150 products and services has been expanded since last year to include about 30 new exhibitors.

The conference is a joint production of the U.S. Department of Energy, Electric Power Research Institute and Edison Electric Institute. ⚡

Calendar of events

Visit Western's regularly updated Energy Event Calendar for a complete list of seminars, workshops and conferences.

<http://www.wapa.gov/es/pubs/esb/2007/jan/jan07coe.htm>