Energy Services

BULLETIN

June 2005

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

Air Force base cuts costs with methane generation

he Davis County, Utah, landfill supports our military with 1.2 MW of clean, renewable energy. Hill Air Force Base near Salt Lake City is the first Federal facility with its own dedicated landfill-gas powerplant. Located less than two miles from the small landfill, the base is the perfect end-user for methane-generated energy. "They were just flaring the gas before Wasatch approached us last year with the idea of using it for power," said Base Utility Manager David Abbott.

Wasatch Integrated Waste Management District owns the landfill.

Agencies move quickly

A self-generation project with a renewable resource component held several potential benefits for Hill. The base must comply with

What's inside

Saving water 2
Fuel cell projects 4
Hopi Energy Fair 5
Power shopping 6
Rebuild Colorado 7
New cooler 8
Capturing digester gas10
Administrator's award11
Workshop-in-a-box13
Energy Shorts15

Executive Order 13123 to reduce its energy consumption by 30 percent by 2005. The projected output of the plant would supply a little over 3 percent of the base's electricity needs, independent of grid events and rising energy prices.

Also, the facility could help Hill minimize

the impact of time-of-use charges levied by its power provider Utah Power.

Base energy officers presented the idea to Department of Energy officials at a conference they attended shortly after their discussion with Wasatch. "They were interested enough to come up and meet with people from the county," said Abbott.

The proximity of the base to the landfill convinced the DOE that a facility was viable, and the project moved forward.

Savings pay for projects

One thing that sped the project along was the Federal Energy Management Program's Super Energy Savings Performance Contract. The



This landfill gas-to-energy powerplant supplies 1.2 MW of clean renewable energy to Hill Air Force Base in Davis County, Utah. (Photo by HDR Inc.)

streamlined procurement process allows Federal agencies to award energy-saving projects to a pre-approved list of contractors and realize the cost and energy savings immediately.

The \$3 million project received the first Technology Specific Super ESPC for biomass and alternative methane fuels. The tech-specific Super ESPC finances energy-saving systems that are not yet readily available through routine procurement processes. Biomass and alternative methane fuel is the latest technology to be covered by this category.

FEMP created the Super ESPC so Federal energy and facility managers could improve their buildings and install new energy-saving equipment without an up-front investment. The

See AIR FORCE, page 3

Utilities discover saving water saves energy

ately, the energy and water industries have been taking a closer look at the complex interconnection between two resources.

Water use consumes 8 percent of the country's energy for treatment, transportation and heating. The energy needed for these functions is the "embodied energy" in water use and is measured in kWh/gallon.

Likewise, powerplants require "embodied water," expressed in gallon/kWh, to cool systems. Since these functions occur mostly during peak use hours, it is clear that water conservation also carries embodied energy-saving opportunities.

"Water and energy conservation are often stove-piped as separate programs, but planners are starting to see the value of a systems approach," said engineer Judy Dorsey. Dorsey is president and principal engineer of the Brendle Group, a Fort Collins, Colo., engineering consulting firm that specializes in energy efficiency, pollution prevention, water conservation and sustainable design.

Energy Services Bulletin

The Energy Services Bulletin is published by Western Area Power Administration for its power customers. The mailing address is Western Area Power Administration, P.O.Box 281213, Lakewood, CO 80228-8213; telephone (720) 962-7451.

The mention of any service, product, or technology does not constitute an endorsement of same and Western, the Department of Energy, or the United States Government cannot be held responsible or liable for use thereof.

Editor: Kevon Storie **Designer:** Grant Kuhn

City cuts water use

The Brendle Group is working with Fort Collins Natural Resources Department on a project that will quantify greenhouse gas emission reduction through water conservation. The project is part of the city's Climate Wise business outreach program.

"The Climate Wise goal is to reduce the city's annual CO_2 emissions by 90 thousand tons by 2010," said Kathy Collier, the city's environmental planner. "Adding water conservation should help us reach the target faster."

The project will draw from case studies the Brendle Group did on the Climate Wise member Anheuser Busch brewery in Fort Collins, and on the University of Colorado in Boulder. In 2003, Anheuser Busch reduced water use per barrel by nearly 12 percent over the previous year by making changes in the manufacturing process.

Siemens Building Technologies tapped the Brendle Group's water/energy expertise to support a performance contract Siemens had with CU's housing department. The Brendle Group conducted domestic, irrigation and process water audits of several campus buildings.

Conservation measures based on the audit results saved the university more than 76,000 kgal per year for a cost savings of \$382,275 and a 4.3-year payback. "It was a perfect example of how water savings can pay for energy projects," said Dorsey.

Such results show the value of



Water consumes huge amounts electricity for treatment, transportation and heating and cooling.

conservation investments to taxpayers, Collier added.

Utilities teach consumers

Dorsey agreed that it is important to communicate the water/energy connection to residential end-users. Those customers are not as likely as utilities and large industrial customers to see significant direct savings from integrated conservation plans, she admitted. "Still, people don't pay for water they don't use, so there is some immediate savings potential," Dorsey said.

Many Western customers share Dorsey's belief and have programs to promote water conservation by residential and business consumers.

Fort Collins successfully reduced water use with an outreach program in 2002, the driest year recorded in Colorado. Water Conservation Specialist Laurie D'Audney recalled that Fort Collins Utilities used extensive advertising, press releases and articles to reach both residential and commercial accounts.

During 2003 and 2004, residential customers received coupons in their utility bills for conservation kits

See SAVING WATER, page 3

Saving water

from page 2

that included showerheads, faucet aerators, shut-off hose nozzles and sprinkler timers.

Riverside, Calif., Public Utilities and Roseville, Calif., Electric are among the many municipal utilities that take a similar approach to wise water use with a mix of online educational resources, incentives and services.

Customized campaigns

Many utilities offer landscaping programs and gardening tips tailored to dry climates, which abound in Western's territory. Sprinkler system audits, customer rebates for appliances like high-efficiency clothes washers and ultra-low-flush toilets encourage end-users to use less.

Riverside businesses can receive rebates for toilets, high-efficiency, self-closing pre-rinse spray valves, and much more through the Be Waterwise partnership of Southern California water agencies.

Programs like Be Waterwise and Water Use It Wisely create marketing and education materials and partnership promotions that utilities can adapt for their own programs. Western customers Salt River Project and the city of Mesa, Ariz., are Water Use It Wisely sponsors.

Broad planning needed

Consumer education alone will not realize the savings potential of

integrated water/energy conservation.

Measures such as offering incentives for water agencies to build more storage and testing time-of-use water meters are beyond the scope of small utilities. "With more than 2,000 water districts in Colorado, state-wide conservation planning requires coordination of sometimes limited resources," Dorsey said.

However, as more data emerges quantifying the cost and energy savings of water conservation, opportunities for water and power providers to pool their planning resources may also arise. In the meantime, utilities can only benefit from recognizing the water/energy connection and encouraging consumers to use both wisely.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2005/june/jun052.htm

Air Force

from page 1

savings from the project pays for the cost of installation.

Hill uses the power from the landfill-gas generator and receives a credit from Utah Power of \$.04/kWh under Rate Schedule 37. "So we are paying Ameresco instead of the utility," said Abbott.

Many rewards

Under Energy Engineer Lt.
Timothy Hinko, construction on the plant began in April 2004 and immediately yielded a valuable fringe benefit. Although Ameresco handled most of the building, Hill utility personnel laid 1.5 miles of pipeline

on the base. "We used it as a training opportunity, because they don't often get the chance to do heavy construction," observed Hinko.

Wasatch put the landfill gas compression and conditioning station online and laid about 3,000 feet of pipeline to the base's fence line. Although the base is initially accepting only 400 to 500 cfm, depending on the quality of the gas, the compressor unit is sized to handle 900 cfm/scfm. Oversizing the system will allow the landfill to send additional gas when it becomes available.

The new powerplant is located next to the electrical substation serving the base. It houses switchgear and two Caterpillar generators with a total capacity rating of 1320 kW. There is room to add a third generator.

The landfill-gas plant is expected to save Hill an estimated \$394,379 in annual energy costs. It also reduces annual emissions by 5,000 tons of carbon dioxide, 4.8 tons of carbon monoxide, 19 tons of sulfur dioxide and 5.5 tons of nitrogen oxide.

Numbers like those—and the 2004 Industry Partner of the Year award Ameresco received from the EPA Landfill Methane Outreach Program—suggest that more landfills should be drafted into service. Federal agencies may one day look on landfills as a great ally in the fight for energy independence.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2005/june/jun051.htm

Projects point to growing interest in fuel cells

he Colorado Governor's Office for Energy Management and Conservation and Anaheim, Calif., Public Utilities recently launched projects aimed at overcoming the many barriers still facing fuel cell technology.

Focus on research

In April, OEMC announced the establishment of the Colorado Fuel Cell Center. The Colorado School of Mines, the Gas Technology Institute, the National Renewable Energy Laboratory and Versa Power Systems, Inc., submitted the proposal for the center. The CFCC will focus on expanding fuel cell-related research, development, education and commercial application in the state.

"Our goal is to get research and development going, and help Colorado companies toward commercialization," said OEMC Executive Director Rick Grice.

The center will be located at the Colorado School of Mines and GTI will supply technical support and manage its daily operations for the two-year period. CSM students and faculty will perform research at the CFCC.

NREL brings its long-standing experience with hydrogen fuel to the project. "The key issues in terms of fuel are how to produce hydrogen in a clean way and how to store it safely and efficiently," said Associate Director for Science and Technology Dr. Stanley Bull.

One research project may focus on splitting water molecules with sunlight to get hydrogen. "In the lab, we've performed the process indirectly with a type of algae," said Bull. "We need to find materials that are economical and durable."

Practical approach

While the CFCC represents the academic path to gaining experience with fuel cells, Anaheim Public Utilities is opting for the hands-on approach. In the same week as the OEMC announcement, the municipal utility dedicated a new fuel cell system powering the East Anaheim Police Department and Community Center. A \$200,000 grant from the DOE's Climate Change Fuel Cell Buydown Program helped offset the fuel cell's purchase and installation.

Developed by UTC Fuel Cells, the 200-kW unit produces enough energy to power 250 typical homes. Since a 50-kW solar array already serves part of the building's load, "Any excess power will be fed back into the electric grid," said Marcie Edwards, general manager of Anaheim Public Utilities.

The solar and fuel cell systems complement each other said APU Spokesperson Mike Ebbing. "The installation of a fuel cell along with existing solar panels makes this facility a showcase for environmentally-friendly power generation," he explained.

The utility's first fuel cell runs on natural gas and is 15 to 30 times cleaner than a combined cycle powerplant, Ebbing said. "In addition, the waste heat from the fuel cell is



Anaheim Public Utilities General Manager Marcie Edwards and City Council Member Bob Hernandez dedicate a 200-kW fuel cell at the East Anaheim Police Department and Community Center. (Photo courtesy of Anaheim Public Utilities)

captured and supplements the heating system of the building. By making use of the waste heat, the fuel cell's efficiency increases to 80 percent."

Businesses, communities benefit

Those environmental benefits are enough for the utility, for now. "On the next project, we may want to look at renewable fuels like digester gas or landfill gas," Ebbing said. "We want to learn all we can about sizing and life cycle and practical business applications, and renewable energy is part of the curve."

California electric retail sellers of electricity must establish a renewable portfolio standard of 20 percent by 2017. Anaheim Public Utilities expects to have over 15 percent renewables by 2017. Ebbing sees the city's fuel cell project as good preparation. "That's why we are diversifying our portfolio with wind and solar now," he explained. "Fuel cells running on renewable-derived hydrogen would count toward the standard."

See FUEL CELLS, page 9

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2005/june/jun053.htm

Hopi explore options at 2005 Energy Fair

nergy issues are giving the
Hopi Tribe a lot to think about
these days, so the new Western customer invited the players—
power providers, renewable energy
companies, other tribes with energy
concerns—to share expertise, technology and ideas at a day-long
educational event that was the first
of its kind on the reservation.

The Energy Fair, held on March 22 in Keams Canyon, Ariz., was a joint production of the tribe and the EPA Clean Air Partnership Project. "About 150 people attended," said Hopi Public Relations Officer Vanessa Charles. "That included tribal members, students and exhibitors."

Diverse crowd

Western's CRSP Management Center was a co-sponsor of the Energy Fair, and an exhibitor. Arizona Public Service Company, Salt River Project, Peabody Coal and Dine Power Authority were among the power companies exhibiting at the event. Wind Powering America, Foresight Energy and Sacred Power Corp. represented the renewable energy industry. Members of the Southern Ute Growth Fund, the Navajo Tribal Utility Authority and Yavapai Apache Nation were on hand to discuss the benefits and challenges of tribal-owned energy ventures.

"The purpose of the fair was to provide the Hopi with information and education on energy topics that impact the tribe," said Energy Services Manager Paula Fronk. "The fair did a great job of covering the bases in its first year."

Attendees found exhibits very informative, said Charles. "Western's

exhibit was especially interesting," she added. "There were three or four tables, and [Energy Services Manager] Ron Horstman brought a plethora of tools."

The elaborate display included a wind anemometer, infrared camera, hydrogen fuel cell and small wind generator from the Equipment Loan Program.

CRSP Administrative Officer David Bennion brought along information on Western as a career opportunity with the Federal government. "Western was one of the only exhibitors to talk about job creation," noted Charles.

Critical issues

Employment and energy concerns intersected at one of two panels at the Energy Fair. Peabody Coal hosted a discussion on the possible closure of the Mohave Generating Station in Laughlin, Nev., for failing to meet emission standards. That would force the coal company's Black Mesa mine, Mohave's supplier and one of the few employers on the reservation, to lay off workers. Peabody also pays the tribe more than \$7 million a year for the volume of coal mined from the operation.

The panel, comprising tribal council members and Peabody representatives, took questions from the audience about the effect closure could have on the Hopi. All involved parties are working together to keep the generating station open, Charles noted. "The coal and water agreements are really close to being resolved."

Transmission reliability, a concern that ranks as high for the Hopi



CRSP Energy Services Manager Paula Fronk and Contracts Team Lead Burt Hawkes staffed the Western exhibit at the Hopi Energy Fair. (Photo by CRSP Management Center)

as the fate of the Mohave station, was the topic of the second panel. The Arizona Corporation Commission listened as representatives from the tribal Office of Elderly Services, Department of Administration and Technical Services, Health Center, radio station KUYI and local Bureau of Land Management described how unreliable electric service affects their operations. "Outages cause thousands of dollars of damage to critical equipment that the programs have no way to recoup," explained Charles.

She commended the ACC for participating in the Energy Fair. "It speaks volumes for their willingness to work with residents," she said. It helped the commissioners understand how remote we are, how dire the need for reliable service is, and that the need doesn't stop at the reservation border."

See ENERGY FAIR, page 14

Power shopping brings utility, customers together

he most challenging connection a utility must make may be connecting with its customers. Lincoln Electric System of Lincoln, Neb., met that challenge by inviting its customers to go shopping—Power Shopping.

Bill stuffers, newsletters, Web sites and advertisements are proven effective ways to communicate with consumers, but the municipal utility wanted to put a human face on its service. "People today simply do not have much time to attend a lot of customer meetings," said Carolyn Douglas, Corporate Communications Coordinator for LES. "So we decided to take our outreach program directly to the people."

LES Vice President and Assistant Council Shelley Sahling-Zart came up with the concept of Power Shopping in 2002. "People do a lot of shopping on the weekends, and Sahling-Zart thought a Saturday event at a local shopping mall would be effective," Douglas explained.

Sahling-Zart knew that placing utility representatives at the South-Pointe Pavilions Mall, one of Lincoln's premier outdoor shopping centers, would guarantee plenty of passers-by. But getting customers to stop and talk with them would take more than a folding table and a few leaflets. The fun began with the solution.

Something for everyone

"People shop with their kids, so we wanted to give both parents and children something to do and learn," explained Douglas. "While an adult might be prone to walk right by our event without stopping, they might pause and look if we could catch their

children's attention," she added.

To attract the interest of both, LES set up a series of booths called Power Stations that represented key areas of utility operations. Each station was staffed by employee volunteers who offered information on programs and services to adults and entertaining activities to children.

For example, last year's Power Supply Station featured information about wind energy to highlight LES's renewable energy program. The utility has two turbines on the northeast side of Lincoln and participates in another wind generation project in north central Nebraska. "It's difficult for customers to visit the turbines, so the planning committee thought, 'If we can't take customers to the turbines, let's bring the turbines to the customers," Douglas recalled.

Visitors drew a life-size chalk outline of a turbine blade on the mall sidewalk. Captions written at different points alongside provided size comparisons with recognizable objects such as a school bus. Employee volunteers talked with parents about the voluntary program while their children were given pinwheels that playfully illustrated the principles of wind power.

The Careers Power Station offered a "What's My Line" quiz that asked children to circle a picture of an activity and connect it to a job title. Interested adults could pick up information on job openings and benefits.

Addressing current issues

Power Station categories have remained the same from year to year, but the content changes to focus on issues that may be on customers' minds. "For example, if we are asking for a rate adjustment, the Consumer Services Station would offer an explanation of why we need the change, comparison charts to show what our peer utilities charge and statistics that compare our rate adjustments to inflation," Douglas said.

Past displays have included an electric hybrid car, a demonstration of infrared camera inspections and a bicycle generator that people could pedal to power a light bulb. LES's safety demonstration for kids illustrates the danger of coming into contact with electrical facilities by showing how a hot dog is instantly fried when touched to a live wire. "We don't want to miss an opportunity to talk about safety," insisted Douglas.

A steering committee of customer and corporate communications staff and employees from every division begins planning Power Shopping months in advance. Division representatives head up subcommittees that suggest activities for each station and execute the ideas. "Anyone can submit an idea for an activity or demonstration," Douglas said.

Participation grows

Power Shopping continues to grow in popularity. The first year, division vice presidents had to appoint representatives to the steering committee and found that recruiting volunteers was difficult. Since then, however, nearly the same steering committee has volunteered to plan the event, and there are more than enough volunteers to staff the Power Stations. "Nearly a third of our employees volunteered at the 2003 event," Douglas said.

See POWER SHOPPING, page 9

Rebuild Colorado teaches schools to save energy

magine a small town struggling to defend its little schoolhouse against heartless forces trying to close it down. Then a circuit rider from the governor's office arrives with a plan and saves the day.

What sounds like the plot of an old Western movie actually describes Rebuild Colorado's outreach program to help rural Colorado school districts cut expenses by reducing energy consumption.

Rural schools benefit

The Colorado Governor's Office of Energy Management and Conservation launched Rebuild Colorado in 1997 with funding assistance from the Department of Energy. The program helps building owners identify energy-saving opportunities and make those projects a reality.

To date, more than 200 state agencies, colleges and universities, cities, counties, schools, other local governments and non-profit organizations have benefited from the program. "The Savings Roundup program for rural school districts apply a proven concept to a new initiative," said OEMC Senior Program Manager Linda Smith.

The reason for targeting rural school districts is that many of them really are the proverbial one-room schoolhouses. The forces threatening them are rising electrical and natural gas rates coupled with shrinking rural populations. The districts receive funding based on the number of students enrolled, and many of them have only 100 students, said Smith. "Any money they can save is going to make a difference."



Wiley Consolidated School in southeastern Colorado cut its energy bill with low- and no-cost measures recommended by Rebuild Colorado's circuit rider. (Photo by PCD Engineering)

Finding leaks and losses

Free technical assistance like building audits and ongoing support meetings show facility managers how to achieve those savings.

The Savings Roundup begins with the circuit rider performing a one-on-one mini-audit of the school. Peter D'Antonio, president of PCD Engineering Services is Rebuild Colorado's circuit rider. "Basically, I'm acting as energy manager for 120 small districts that don't have an energy manager," he explained.

At the one-building, Wiley School District in southeastern Colorado, the audit revealed that an HVAC component had been installed incorrectly. "The system was turning on the air conditioner when it could have been drawing outside air to cool," said Superintendent Mike Doyle.

To make matters worse, a third of the facility's roof was not insulated. "Our heating and cooling was going right through the ceiling," said Doyle.

Common-sense measures

In addition to preventive maintenance of HVAC systems, D'Antonio pushes low- and no-cost energy savings measures. Lighting is the biggest savings opportunity, along with turning off computers and turning down the HVAC system when the building is empty.

The energy myth about using more energy to switch lights off, then on again, and the belief that turning a computer off at the end of each school day hurts the system are persistent, said D'Antonio. "Schools end up paying to keep lights and computers on in empty classrooms."

See REBUILD COLORADO, page 14

New cooler combines comfort, efficiency

revolutionary new cooling technology that delivers the comfort of an air conditioner with the efficiency of an evaporative cooler is creating a big buzz.

Coolerado, located in Arvada, Colo., puts a 21st century spin on evaporative cooling. R&D Magazine's 100 Awards program hailed the system as one of the year's most technologically significant products introduced to the world in 2004. Sacramento Municipal Utility District and the Colorado Governor's Office of Energy Management and Conservation have partnered with the company on demonstrations.

"It cools as well as an air conditioner, and on a third the amount of electricity," said OEMC Senior Deputy Director Ed Lewis. "There are no greenhouse gas effects and it doesn't release water into the air that enters the building."

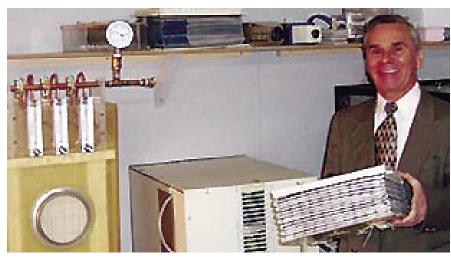
Mimics air conditioning

Because the Coolerado cooler uses water to cool, people often mistakenly compare it to direct evaporative, or swamp coolers. The traditional, refrigerant-based air conditioner is a more apt comparison.

The unit draws fresh outside air from the supply side. A heat and mass exchanger removes the heat from the product air similar to the way an air conditioner cools the air stream.

Both the Coolerado Cooler and the conventional air conditioner reject heat into the atmosphere outside the building. Swamp coolers add moisture to the air and do not reject heat.

Unlike conventional AC units, the Coolerado uses no ozone-depleting chemicals. Setting the Coolerado apart



Dr. Valeriy Maisotsenko displays the patented heat and mass exchanger that employs the thermodynamic cycle that bears his name. (Photo by Coolerado)

from traditional indirect evaporative coolers are a unique wetting system, a heat and mass exchanger made of unusual material and the way the air flows through the modular HMX. "The heat and mass exchanger is what does most of the work," said company President Rick Gillan.

The HMX is made of plastic-coated, cellulose blend fiber in a geometric design that cools both the product and working air streams. This cascading incremental airflow creates a new thermodynamic cycle called the Maisotsenko Cycle after Dr. Valeriy Maisotsenko who discovered it. Dr. Maisotsenko is a partner in Idalex Technologies, Coolerado's parent company.

Demonstrations show promise

Gillan estimates that more than half the world's cooling applications could benefit from a Coolerado system. Coolerado's first commercial demonstration with the OEMC and Mount St. Vincent Home in northwest Denver illustrated the cooler's consumer value. A project team installed a model C676 on the roof above the school's computer lab in 2003. The unit cooled the century-old building to 74 degrees using 80 percent less power than an air conditioner.

SMUD Project Manager Dave Bisbee met Idalex representatives at an evaporative cooling meeting where he was sharing his utility's experiences with an indirect/direct system. "I told vendors that IDECs won't take off until the reliability improves," he said.

Gillan considered that a challenge and offered SMUD a Coolerado system to test. "We decided to test the Coolerado at a school that has been experiencing chronic problems with their IDECs. They had nothing to lose," said Bisbee.

SMUD's Customer Advanced Technologies Program sponsored the replacement of an IDEC on a Sacramento school with the Coolerado in August 2004. The first thermal measurements were impressive, but the true test will be a full cooling season, said Bisbee.

See NEW COOLER, page 9

New cooler

from page 8

Increased availability

On the power production side, the Coolerado could be used to improve the performance of combustion turbines. High temperatures can cut a turbine's output by up to 30 percent. Cooling the intake air with a Coolerado could restore the turbine's efficiency without drawing significant power.

OEMC is looking at installing a unit on some of its demonstration microturbines. Another California utility is considering a similar installation at one of its gas-driven peaking plants. Gillan said that the company has enough HMXs in stock for one full-scale industrial project.

So far, Coolerado has limited availability to select projects, manu-

facturers and distributors. That will change soon. Idalex has entered into a manufacturing agreement with Delphi Corp. "We anticipate that units will be more available to the general public by the end of the year," said Gillan.

Market barriers

With sufficient units in stock and an established manufacturer, the company would like to get utilities to include the Coolerado in incentive programs. Tri-State Generation and Transmission and Colorado Springs Utilities have expressed interest in the efficient coolers, according to Gillan.

To be widely accepted into utility rebate programs, Bisbee said, the unit must prove its reliability over extended operation. "Consumers need to know what the projected maintenance requirements are. Every system

Want to know more? Visit www.wapa.gov/es/pubs/esb/2005/june/jun057.htm

Power shopping

from page 6

Customer participation in Power Shopping has grown steadily, too. In its first year, about 150 people attended. At the second annual event, the crowd doubled. In 2004, good weather, strong publicity and growing public awareness led more than 500 people to give Power Shopping a try.

Publicity isn't the only reason for increased attendance, Douglas pointed out. "We learned that children are asking their parents to bring them to Power Shopping and adults who came the year before make a point to come back."

Local businesses have also jumped on the Power Shopping bandwagon. Mall retailers, restaurateurs and local food companies donate refreshments and prizes for drawings. LES publicly recognizes all of its partners.

Lincoln Electric System considers the event a great success and does not hesitate to recommend the format to other utilities looking for a unique outreach event. "Power Shopping is great for customers, the utility and the community," said Douglas.

Want to know more? Visit www.wapa.gov/es/pubs/esb/2005/june/jun055.htm

has maintenance requirements," he noted.

A local vendor network would encourage utilities to offer rebates for the system, too, he added. Bisbee concluded, "I really want to see this technology work like they say it does."

You can almost hear those words echoed by Coolerado's inventors, utilities, facility managers and homeowners everywhere.

Fuel cells

from page 4

Whatever the utility learns from the fuel cell project it will share with its business customers, Ebbing added. Bull agreed, pointing out that fuel cells are excellent systems for any business that can't afford to lose power. He said, "Fuel cells could do the same work as diesel generators, only cleaner."

Such stationary applications will be the focus of CFCC research because they offer the best opportunity for early commercialization. "There are fewer requirements for stationary power sources than for transportation applications," said Bull.

Forward-thinking groups like Anaheim Public Utilities and the Colorado Fuel Cell Center partners are doing the work to bring hydrogen fuel cells closer to commercialization. In the process, they are positioning their communities to reap the environmental and economic rewards.

Wastewater treatment plants tap power in digester gas

he Los Angeles County Sanitation Districts are demonstrating that there is more than one way to turn digester gas into electricity and heat at several water reclamation plants.

The districts generate a total of about 87 MW of biogas power, with 23 MW coming from four self-generation projects. "There are a lot of good reasons for using biogas to generate power, both economic and environmental," said LACSD Division Engineer Ed Wheless.

Those reasons include reducing emissions that contribute to global warming, increasing plant reliability through the use of waste heat and standby generators and saving money on power purchases. "Both Palmdale and Lancaster will save approximately \$150,000 each year on their power bills," Wheless said, naming the most innovative installations as examples.

The generators at those two water reclamation plants represent firsts for biogas projects. In January 2005, the Palmdale WRP commissioned California's first high-efficiency fuel cell to run on gas from a wastewater treatment plant. The Lancaster plant is the first wastewater treatment plant in the western United States to run a large microturbine on its digester gas.

High efficiency, low emissions

The Palmdale plant draws about 36 percent of its power needs from the 250-kW DFC 300A molten carbonate fuel cell built by FuelCell Energy.

The unit uses about 60 percent



This fuel cell and waste heat recovery unit provides 36 percent of the power needs of the Palmdale, Calif., water reclamation plant. (Photo by Los Angeles County Sanitation Districts)

of the digester gas the plant produces from processing wastewater. Using the waste heat from the fuel cell as process heat boosts its 47-percent electrical efficiency to a total electrical and thermal efficiency of 73 percent.

A grant from the California Public Utilities Commission paid for half the \$1.9 million cost of installation. The districts had wanted to test a fuel cell "forever," explained Wheless. "The funding from the Self-Generation Incentive Program combined with low interest rates made it economical," he said.

Microturbine suited to plants

A CPUC grant also funded about 40 percent of the microturbine installation at the Lancaster WRP. Even without the incentive, Wheless pointed out, the microturbine payback should only be about three years.

The 250-kW Ingersoll-Rand generator cost only \$720,000 to install and has been more widely used

than the fuel cell. That may make the microturbine a better choice for wastewater plants. The unit provides 24 percent of the plant's electrical demands and uses about 64 percent of the available digester gas.

Ingersoll Rand designed and built the fuel-conditioning system necessary to prepare the gas for combustion. The company provides operating and maintenance services for the first three years.

The microturbine burns low-BTU gas efficiently, producing ultra-low nitrogen oxide and carbon emissions. The Palmdale fuel cell system has near zero emissions. "In both cases, the emissions are far less than flaring," said Wheless.

Committed to biogas

The districts' history of using biogas to produce electricity dates back to 1938. The joint water pollution control plant in Carson, Calif., burned gas from wastewater

See WASTEWATER, page 12

Administrator's Award honors NPPD achievements

ebraska Public Power District earned Western's prestigious Administrator's Award by keeping an eye on the future while listening closely to its customers.

The award acknowledges Western customers who demonstrate superior achievements and commitment to energy efficiency and renewable energy. NPPD CEO Bill Fehrman accepted the award at the district's Columbus, Neb., headquarters. Upper Great Plains Regional Manager Robert Harris presented the award on Western's behalf.

The nomination recognized NPPD for developing the Ainsworth, Neb., Wind Farm, for its innovative customer input program and for its technical assistance program. UGP Energy Services Manager John Pankratz and Facility Engineering and Construction Manager Craig Knoell nominated the utility.

"NPPD has been very innovative and proactive by merging its customers' needs into a strategic commitment to renewable energy development," said Knoell, who was formerly a field representative with Western's Upper Great Plains regional office.

State wind development

NPPD's board of directors approved the development of the state's biggest wind farm August 2004. State and municipal officials and representatives from utilities participating in the project attended the groundbreaking April 13.

Ainsworth will generate up to 60 MW of energy. NPPD will distrib-



NPPD CEO Bill Ferhman displays the Western Administrator's Award. Presenting the award were (left to right) Public Utilities Specialist John Pankratz, Upper Great Plains Regional Manager Bob Harris and Facility Engineering and Construction Manager Craig Knoell. (Photo by Nebraska Public Power District)

ute 32 MW to its wholesale power customers and retail communities. Omaha Public Power District, Municipal Energy Agency of Nebraska, Grand Island, Neb., Utilities and JEA of Jacksonville, Fla., have agreed to purchase portions of the facility's output.

NPPD anticipates that the facility will be ready for commercial operation by the fourth quarter 2005.

Groups offer guidance

The development of Ainsworth was cemented by customer feedback NPPD gathered in 2003 through deliberative polling. The trademarked process involved surveying more than 500 consumers and inviting 100 survey participants to learn more about renewable energy.

"The dialogue confirmed that the consumer base fully supported renewable wind energy," said System Control Manager Tim Arlt.

NPPD's Power Resource Advisory Board also lent its support to large scale wind development. The board was one of two groups NPPD and its customers formed to give wholesale and retail customers more involvement in critical policy discussions.

The Power Resource Advisory Board evaluates NPPD's power supply and makes recommendations about adding to or eliminating resources from the power supply portfolio. "The PRAB let the board of directors know they were strongly in favor of developing Ainsworth," Arlt said.

The second group, the Rate Review Committee, helps NPPD develop rate methodology and strategies. "By giving our customers a voice in decisions, we get their buy-in at the front end," explained Arlt.

See AWARD, page 12

Wastewater

from page 10

sludge digesters to provide all its light and power needs.

Today, the JWPCP facility has three nine-MW gas turbine generators and one three-MW steam turbine generator. Gas from district WRPs fuel internal combustion engines, gas turbines, steam boilers and Capstone microturbines. District landfills sell biogas-generated electricity

to Southern California Edison.

Wheless estimates that as many as 19 wastewater treatment facilities statewide could install fuel cell or microturbine systems that qualify for the CPUC incentive. "The smaller plants are ideal candidates for a two- to three- year payback," he said.

Wheless would like to see more wastewater plants take advantage of the technology. With almost 70 years in the business of turning what others think of as waste into water, energy and recyclable material, the Los Angeles County Sanitation Districts are in full agreement.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2005/june/jun058.htm

Award

from page 11

"These groups symbolize the public power tradition of local participation," said Pankratz. "They give customers a proactive voice in the strategy and decisions that impact them the most."

Training addresses issues

Customer needs are also the focus of the Technical Solutions group, the third program area recognized by the Administrator's Award. NPPD customer representatives provide retail and wholesale power customers and their consumers with technical

energy efficiency solutions and training.

"When we hold a training session, we invite both the end users and their power suppliers to attend," Arlt said.

Sessions have covered such topics as harmonics, power quality and HVAC technology. A recent statewide lighting efficiency training workshop attracted participants from the residential and commercial sector, as well as state and municipal facility managers.

Choosing the topics for the workshops, "is a two-sided coin," said Arlt. "The Technical Solutions group responds to customer needs, but at the same time, it is proactive in its initiatives. It's always better to help

customers avoid a problem than solve one."

"That kind of commitment to energy efficiency is how the Technical Solutions group consistently meets and even exceeds customer expectations," added Pankratz.

And looking out for its customers today while developing new energy sources for tomorrow is how a utility earns the Administrator's Award.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2005/june/jun059.htm

Wind Workshop in a Box gets a facelift

t is not messing with success to change with the times, so Western asked the Interstate Renewable Energy Council to update its popular Wind Workshop in a Box kit.

Western's workshop-in-a-box kits provide state, municipal and governmental agencies, community groups, utilities and other consumers with information about renewable energy technologies. IREC has also created workshop kits for solar power, neighborhood power and solar school projects. Workshop-in-a-box kits are among the many tools available to Western customers through the Energy Services Equipment Loan program.

New communication tools

IREC developed the first Wind Workshop-in-a-Box in 2000 for DOE's Wind Powering America program. Wind technology has moved forward in leaps and bounds since. Just as important, so have communications media. The original CD-ROM was static. "It had a lot of hard copy—photos, PowerPoint presentations and PDFs," said IREC Program Manager Jane Pulaski.

Pulaski designed both versions of the kit under Western's direction and is proud of the new Wind Energy: Building Our Homes, Businesses and Communities Workshop-in-a-Box CD-ROM. "It's all interactive," she explained.

The CD table of contents is permanently displayed in a left-hand navigation menu. Users can browse and select from eight chapters covering an introduction, workshop tips and sample agendas, general



The updated Wind Workshop-in-a-Box offers interactive CD ROMS, publications and videos in a handy carrying case.

information, resource assessment, policies, utility-scale wind energy, small-scale wind energy and resources.

The main window displays the contents of each chapter including printable documents and online resources. "When we put the first kit together five years ago, the online resources weren't anything close to what they are today," said Pulaski. "We made an effort to scoop up the best and most current information out there."

Pulaski credited the graphic designer and technical consultant with doing a great job of organizing the information into a clear and easy-to-use format.

Mix-and-match materials

The effort resulted in a one-stop shop for creating workshops on both small- and utility-scale wind. The CD-ROM offers sample agendas for a half-hour meeting, half- or full-day workshop, as well as PDFs to print as handouts. In addition to the CD-ROM, the kit contains:

- The Wind Power Handbook for Public Utilities: A Summary of State Wind Working Group Handbook.
- Wind Power: Today and Tomorrow, a DOE document.
- *The Crop of the Future*, a 10-minute DVD from Waverly, Iowa, Light and Power.

See FACELIFT, page 16

Energy Fair

from page 5

Future partnerships

With the success of the Energy Fair under its belt, the Hopi tribe is now looking at the next steps toward energy self-sustainability. The fair introduced new ideas and helped to clarify some of the options, said Charles. "We need to compile what we've learned, and then we can form a plan based on positive models."

Setting up a Hopi-owned and controlled utility will remain a priority, as will creating jobs and income for the tribe. The Hopi are open to the possibility of renewable energy ventures. "The fair laid the groundwork for partnership projects," said Charles.

That was true not only for the tribe, but for the exhibitors as well. "It was a great networking opportunity for the exhibitors," she said. "That was an unexpected benefit."

With positive responses from participants across the board, the first Energy Fair won't be the last. "It could become a biennial or even annual event," said Charles. "We saw a great commitment to helping the Hopi build a sustainable economy and infrastructure."



Want to know more?
Visit www.wapa.gov/es/pubs/esb/2005/june/jun054.htm

Rebuild Colorado

from page 7

Doyle confirms the circuit rider's view. "We've always been told not to turn the lights off and on, and getting teachers to remember to turn them off now isn't easy," he said

The Wiley School District has been taking small energy management steps for less than a year, but the superintendent estimates that it is already saving money. "Just turning off the gym lights alone is saving us money," he added.

Further training

After the audit and implementation, facility managers and administrators attend networking meetings to compare notes and share success stories. OEMC also provides speakers on energy

efficiency. "It has to be a district-wide effort to be successful," said D'Antonio. "Energy management is part of the day-to-day business management."

So far, about 20 districts participate in Savings Roundup and Tech 101, a training class Rebuild Colorado sponsors. At a recent meeting in Lamar, about half a dozen maintenance workers showed up. That may not sound like much, but there are only five or six districts in the area and each district has one facility manager.

Program adds value

Representatives from Southeastern Colorado Power Association and Tri-State Generation and Transmission attended the meeting, too.

"The services Rebuild Colorado offers are more extensive than

most rural electric co-ops can provide," Tri-State Senior Engineer Mike McCoy said. "The program connects our members' small but critical accounts with high-quality technical assistance."

Facility managers are the de facto energy managers for school districts, McCoy added. "They need training to do that job and it adds value to a utility's service to help them get it."

Rural school districts may be small energy users, but any hero worth his white hat stands up for the little guy. Rebuild Colorado has done an outstanding job of coming to rescue, saving K-12 schools \$2,850,000 in energy costs to date. Little schoolhouses on the Colorado prairie will continue to scan the horizon for the Rebuild Colorado circuit riders.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2005/june/jun056.htm



Energy Shorts

NREL's green power "Top 10"

Several Western customers once again appeared on the U.S. DOE's National Renewable Energy Laboratory's annual ranking of leading utility green power programs.

NREL rates the top 10 programs in the following categories: total sales of renewable energy to program participants, total number of customer participants, customer participation rate, and the lowest price premium charged for a green pricing service using new renewable resources.

Ranked by sales of green power, Sacramento, Calif., Municipal Utility District placed fourth, selling 176,774,804 kWh in 2004.

In the customer participation category, four of the top five utilities were Western customers. Lenox, Iowa, Municipal Utilities placed first with 14.5 percent of its customers subscribing to its two-year-old green power program. The City of Palo Alto, Calif., Utilities was second, followed by Holy Cross Energy of Colorado in a tie with Montezuma, Iowa, Municipal Light & Power. Moorhead, Minn. Public Service and SMUD were fourth and fifth respectively.

SMUD and Los Angeles Department of Water and Power were fourth and fifth in overall number of customers buying green power from their utilities. Roseville, Calif., Electric, SMUD and Southern Minnesota

Municipal Power Agency tied for ninth place in the pricing category.

Nationwide Green-e certification

The Center for Resource Solutions recently announced that all qualifying renewable energy products in the 50 U.S. states and American territories can receive Green-e electricity certification.

The Green Pricing Accreditation Board approved a National Green Pricing Default Certification Standard for the 18 states that are not covered by existing state or regional Green-e criteria.

As the nation's leading renewable energy certification and verification program, Green-e provides independent, third-party certification to ensure renewable energy products meet strict environmental and consumer protection standards. Green-e's annual verification protects customers from paying for renewable energy that is "double sold" to other customers or used simultaneously to meet regulatory mandates.

Glendale utility approaches goal

A new power sales agreement between Glendale, Calif., Water & Power and the Southern California Public Power Authority will give GWP approximately 25 GWh of renewable energy annually to sell to its customers.

GWP will purchase up to 3 MW from the Ormat Geothermal Energy Projects, moving the utility closer to the state's renewable resource goal of 20 percent by 2017. The addition of the Ormat project will bring GWP's current sales to 16 percent.

The Ormat project will provide energy from two geothermal plants located in the geothermal resource areas of Imperial Valley, California. Hydroelectric power from the Hoover Dam counts as an eligible renewable resource under the RPS. As sales grow, GWP will continue to look for additional renewable generation opportunities.

States pursue green energy

The governors of Iowa and North Dakota celebrated Earth Day 2005 by taking steps to make their states greener.

In Iowa, Executive Order No. 41 directs state agencies to obtain at least 10 percent of their electricity from renewable energy sources and to reduce energy use in state buildings by 15 percent by 2010, relative to energy use in 2000.

In North Dakota, Governor John Hoeven signed several bills into law to accelerate wind power, hydrogen and alternative fuel technologies in the state. The new legislation also created an Office of Renewable

See ENERGY SHORTS, page 16

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2005/june/jun05es.htm

Facelift

from page 13

- The Power of Wind, an 11-minute video by the American Wind Energy Association.
- The National Renewable Energy Laboratory's Small Wind Speakers Toolkit CD.
- Small Wind Electric Systems: A U.S. Consumers
 Guide, by NREL and Wind
 Powering America.

The materials allow users to tailor the mix of written and

visual resources to the audience. The information runs from wind basics to more technical material.

Wider audience awaits

All of these resources come packed in a sturdy cardboard case with a convenient handle. "We wanted people to be able to tote the kit around," said Pulaski. "We expect 'Wind-Workshop-in-a-Box' to go places."

That's likely since 60 Western customers borrowed the first kit. "The new and improved kits should prove even more useful to Western customers," said Western Renewable Resources Pro-

gram Manager Randy Manion.

Western customers won't be the only ones to benefit from the wealth of information in the kit. APPA is making the Wind Workshop-in-a-Box available to its members. "We believe APPA members will find Wind Workshop-in-a-Box a valuable tool for evaluating and developing their community's wind capabilities," explained DEED Administrator Michele Suddleson.

Western customers can request the 2005 Wind Workshop-in-a-Box kit online or call 720-962-7420.

Want to know more? Visit www.wapa.gov/es/pubs/esb/2005/june/jun0510.htm

Energy Shorts

from page 15

Energy within the Division of Community Services at the state Commerce Department.

In separate press releases, both administrations cited the economic benefits, as well as increased energy independence, as a strong incentive for developing renewable energy.

Bird protection plans

The Edison Electric Institute, the U.S. Fish and Wildlife Service and the National Rural Electric Cooperative Association recently issued guidelines for utilities in preparing an avian protection plan.

The collaboratively-developed

guidelines are meant to help utilities create avian protection plans that don't require formal approval from the Fish and Wildlife Service. The guidelines offer plan components and techniques and a formal process for adapting the plan to the specific needs of a location.

A utility could use the guidelines to develop a protection plan that is suited to its area, rather than hire a consultant. The plan covers preparing a corporate policy on protecting avian species, training utility personnel in nest management protocols and carcass disposal and ways to report bird injuries and death. Other sections cover permitting, system design and public education.

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/ 2005/june/jun05coe.htm