

Energy Services **BULLETIN**

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

Western customers honored with 2012 Public Power Wind awards

At the annual meeting of the American Public Power Association (APPA), the Energy Department recognized three APPA members with the 2012 Public Power Wind Award. Moorhead, Minn., Public Service, City of Palo Alto, Calif., Utilities and Minnesota Municipal Power Agency received their awards in Seattle, Wash., on June 19.

Now in its 10th year, the annual award recognized APPA members in three categories: small member system, large member system and joint action agency. "The three finalists this year were very different from each other, and each demonstrated leadership related to the type of utility they were," explained Randy Manion, head of Western's Renewable Energy program.

Small co-op thinks big

Small member system winner Moorhead Public Service (MPS) won for pioneering utility scale wind investments in 1999, and proving along the way that the "little guy"

can be innovative, too. Being small might have actually worked in the municipal utility's favor in developing wind power. MPS is used to listening to its 13,000 customers, and in 1998—years ahead of the 2007 state renewable energy mandate—residents were asking for an innovative renewable energy program.

Capture the Wind, launched a year later, gave MPS customers the chance to voluntarily purchase 1,000-kilowatt-hour (kWh) blocks generated by the city's 750-kilowatt (kW) wind turbine. In less than three weeks, the program was fully subscribed, and a waiting list was growing. A second turbine went online in 2000 to the same reception, and MPS made regular appearances among the Top Ten Utility Green Power Programs in the early part of the decade, recalled MPS Energy Services Manager Dennis Eisenbraun.

He credits Capture the Wind's success to a number of factors: Strong community support, a visionary local governing board and public service commission and cooperation from power wholesaler Missouri River Energy Services. "And homework," Eisenbraun added. "We took nine months to verify our resources, and it was worth the time."

Eisenbraun hopes that the positive glow of the Wind Public Power



Moorhead Public Service's two wind turbines produce the power that its customers buy through the Capture the Wind program. (Photo by Moorhead Public Service)

Award will shine a little light on MPS's latest renewable project, a small 10.5-kW solar array located between the two wind turbines. "We appreciate that other agencies are recognizing our efforts to solve energy problems," he said. "And we believe it all comes down to a mix of technologies."

Marketing builds strong program

Large member system winner the City of Palo Alto Utilities (CPAU) is another municipal utility with an established renewable energy program that enjoys broad community support. The award recognized the utility for a resource mix that includes up to 17 percent wind power, and for its voluntary PaloAltoGreen power program which gets 97.5 percent of its renewable energy from wind.

Even in a community with strong environmental awareness, it took a

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Wind awards

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comprehensive outreach campaign to achieve those numbers. CPAU teamed up with energy marketing agency 3Degrees to craft a message that spoke to its customers' values, and spread it through a "wrap-around" strategy. The multi-pronged approach used email newsletters, community-placed banners, concert and event sponsorship, print ads, direct mail, movie theater ads, booths at special events, discount programs recognition ads and welcome packets. The result was a steady increase in customer participation in PaloAltoGreen from .7 percent at the program's launch in 2003 to 22 percent in 2011.

To satisfy growing consumer demand in 2007, CPAU purchased recently built wind generation, increasing the amount of renewables it offered customers from 5 percent to 17 percent. Last year, the city increased its own renewable energy purchases for city facilities from 30 to 50 percent of their electricity use. "Our community is strongly committed to reducing its carbon footprint," said Utilities Marketing Services Manager Joyce Kinnear. "In 2011 alone, the 6,625 PaloAltoGreen participants prevented the release of more than 17,000 metric tons of carbon dioxide emissions."

Energy Services Bulletin

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PaloAltoGreen, CPAU's award-winning renewable energy program, gets 97.5 percent of its power from wind—one of the reasons the municipal utility is receiving the large member system award. (Photo by City of Palo Alto Utilities)

Having proven that it is possible to dramatically increase renewable power purchases without increasing customer rates, you might think that CPAU's renewable energy program could rest on its laurels. Success, however, comes with its own set of challenges, said Kinnear. "Marketing is tougher than ever since we have reached the 'low-hanging fruit.'"

But she is confident that with CPAU's solid customer relationships and 3Degrees marketing savvy, even the hard-to-reach customer is within reach.

Learning by doing

In the joint action agency category, the Minnesota Municipal Power Agency (MMPA) was honored for its Hometown WindPower program and Oak Glen Wind Farm project. MMPA's Hometown WindPower program installed a wind turbine in each of its member communities, and at its Faribault Energy Park facility, making it the first municipal power agency in the country to have a turbine in each member city. The agency's 44-megawatt Oak Glen Wind Farm entered

service in October 2011, making it the largest municipally owned wind farm in the state of Minnesota.

If siting turbines in twelve different communities sounds difficult, that's because it was, said Oncu Er, planning vice president for Avant Energy, the energy management company that provides long-term planning and day-to-day operations services to MMPA and other clients. "Even though they were only 160-kW turbines, there were implementation challenges," he said.

Hometown WindPower taught MMPA the importance of engaging host communities early and throughout the process of building a facility. The joint action agency also learned to access innovative financing, using Clean Renewable Energy Bonds to fund construction. "We applied many of the lessons we learned from Hometown WindPower in developing and building Oak Glen Wind Farm," said Er.

MMPA began developing Oak Glen Wind Farm in 2005, building solid re-

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Great River Energy launches smart-grid pilot

Talk to consumers about modernizing the grid and they will likely scratch their heads and lose interest—that is, if they don't narrow their eyes and demand to know how much it's going to cost them. But show them how technology can help them shrink their energy bills, and tell them how it can keep their utility from having to build costly new generation, and you will have their interest—maybe even their support. That is the idea behind a \$5 million pilot project launched May 1 by Great River Energy and two of its member cooperatives.

The Minnesota-based power wholesaler has partnered with Minnesota Valley Electric Cooperative (MVEC) in Jordan, Lake Region Electric Cooperative (LREC) of Pelican Rapids and the Department of Energy (DOE) for the smart-grid experiment. The four-year project involves software management systems, smart meters, storage batteries, the Internet, energy-efficient appliances and thousands of households. “The system we're demonstrating collects and processes all consumption data into the accurate, accessible information utilities and consumers need to manage their energy use more effectively,” said Great River Load Management Coordinator Eddie Webster.

Mining a data mountain

Initially, the goal of the project is to give Great River a better understanding of the large volume of data smart systems provide. As these systems replace aging parts of the grid, they threaten to inundate utilities with raw data that can be more confusing than helpful. “Where we used to get hundreds of meter reads a month, we now get thousands, and the readings can be affected by external factors like

weather,” Webster explained.

The energy management software Great River is installing at its headquarters will scrub the consumption data and post it on a web portal. Consumers will be able to log in and follow their hourly energy use and see what their habits are costing them. “If you are going to display that information to the consumer, you need to make sure it is accurate and presented in a way they can understand,” Webster observed.

Figuring out how the data can benefit consumers is the second critical piece of the demonstration. The assumption is that more detailed information could help Great River and member co-ops create more strategic and targeted demand-response and load-control programs.

History of load control

It makes sense that Great River would want to explore ways to apply new technology to a cost-control strategy that has been so successful for its members and consumers. Over the last 20 years, more than 200,000 customers have voluntarily signed up for Great River's appliance control and peak-shaving programs.

In the winter, customers heat their electric thermal storage (ETS) water- and space-heaters overnight with off-peak power. During peak heating days, member co-ops can switch customers on the dual fuel program from electric to another type of heating (usually propane). On hot Midwestern summer days, Great River cycles air conditioners in participating homes and businesses to shave 15 percent off its cooling load.

Imagine what Great River could do with its estimated gigawatt of controllable load if it had more real-time information about customer energy use—the kind of information the

data collection system will provide. “We could potentially ramp those loads up and down as needed to take advantage of variable generation,” said Webster. “Basically, this project is about using technology to take an already successful program to a new level.”

Equipping a modern grid

That technology includes meter data management and demand response management systems, load control devices and software, load management switches, residential battery storage systems and grid-interactive ETS water heaters. Most of these systems are familiar to Great River member co-ops, who have already installed AMI (advanced metering infrastructure) metering and appliance and equipment controls. The only new pieces, Webster noted, are the in-home monitors for participating households.

The National Rural Electricity Association (NRECA) is managing procurement of the software and equipment for the demonstration project. NRECA applied for and received a \$34 million grant from DOE's Recovery funding for grid modernization, and asked member utilities to submit proposals. The projects NRECA selected were those that showed the greatest potential benefit to consumers.

Great River received a \$2.5 million grant, which the power wholesaler and its members matched with their own funds. Some of the utilities' contribution is in-kind, such as labor, added Webster.

Getting customers onboard

MVEC and LREC plan to recruit around 100 customers each to test the various systems. Every participant

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IR workshop comes to Rocky Mountain Region

It seems like some regions get to have all the fun, playing with state-of-the-art infrared (IR) cameras and learning about all the ways the diagnostic tool can save energy and money for utilities and their consumers alike. Well, Western's Energy Services doesn't play favorites—we are teaming up with Tri-State Generation and Transmission Association and Clean Energy Ambassadors to give Rocky Mountain Region (RM) its very own IR camera workshop on Aug. 8.

United Power in Brighton, Colo., is hosting the workshop in its Civic Room from 8 a.m. to 5:30 p.m., and it promises the same information- and action-packed day our Upper Great Plains customers enjoyed at the April workshop. “We appreciate United Power offering the use of their facilities for the workshop,” said RM Energy Services Representative Bob Langenberger. “It's a good central location for many Western customers and Tri-State members.”

“Tri-State has always made an effort to provide its member systems with the tools and programs they need to help promote energy efficiency,” explained Tri-State Marketing Coordinator Ron Ebenkamp. “Recently, several of the Tri-State member systems expressed interest in an IR camera workshop, so we decided to team up with Western to offer training.”

A busy day

As with previous IR workshops, we have invited speakers who have a wealth of experience in thermography and camera uses. FLIR and Fluke are providing the equipment for the hands-on training portion of the workshop, along with case studies of how utilities used the cameras to detect line and substation



Nathan Wilcox of FLIR instructs attendees at the Billings, Mont., workshop in the finer points of interpreting IR photos. (Photo by Clean Energy Ambassadors)

loss. And as always, Gary Hoffmann, Western's Equipment Loan Program manager, will be on hand to remind participants that the program gives them the opportunity to test drive different camera models.

One of the reasons the IR workshop is so popular is that we tailor the agenda to focus on issues unique to the region. The Rocky Mountain perspective on IR camera use is being provided courtesy of Poudre Valley Rural Electric Association. Energy Use Specialist Gary Myers will present the customer service side of thermography use during energy audits, while Operations Manager Glen Livengood will cover the Poudre Valley's plans to use IR cameras to maintain its distribution system.

Member Services Manager Myles Jensen said, “Poudre Valley has benefited from IR camera inspections for many residential and commercial audits, and for some distribution equipment inspections. I think our case study will give workshop attendees a new appreciation and understanding of what an inspection

program can do for their utilities.”

The big attraction, however, is the hands-on training geared to participants' individual experience. Attendees will conduct inspections on selected facilities, learn tips for more effective audits from the pros and print out reports at the end of the day. The workshop wraps up with a question and answer period to help attendees address any issues that came up during field training.

Don't wait to register

In short, the day-long workshop is a crash course on one of the most versatile diagnostic tools available to energy professionals, and all this knowledge can be yours for \$100. The registration fee covers class materials, and continental breakfast, lunch and an afternoon snack. Meals and breaks will also give you time to network with your colleagues, talk about your own IR inspection program or ask someone else about theirs.

The last workshops drew big crowds and space is limited, so

See IR WORKSHOP, page 5



Question:

What do I need to know before replacing windows in 30 commercial buildings that I maintain? For example, how are windows rated and what energy-efficiency features are available?

Answer:

The Energy Solutions Database has a number of window resources you can review (search “Building Envelope,” then “Windows/Doors”). Energy Savers is another good source of basic information on window technology.

Check out Energy Star Residential Windows, Doors, and Skylights to learn about the benefits of selecting Energy Star windows, where to buy them and tax credits that may be available to building owners installing them. Energy Star windows exceed the minimum criteria for energy efficiency in many climate areas.

The National Fenestration Rating Council (NFRC) is a nonprofit, public/private organization, created by

the window, door and skylight industry, that has established a voluntary national energy performance rating and labeling system for fenestration products. The NFRC label rates:

- U-factor, how well a window keeps heat inside
- Solar heat gain, a window’s ability to block warming caused by sunlight
- Visible light transmittance, how much light gets through a product
- Air leakage, heat loss and gain by infiltration through cracks in the window assembly
- Condensation resistance

NFRC publishes an online version of its NFRC Certified Products Directory.

Software

Lawrence Berkeley National Laboratory offers several window analysis software programs, including:

WINDOW – This software calculates thermal performance of fenestration products. The heat

transfer analysis method it uses is consistent with the rating procedure developed by NFRC.

RESFEN – This is a program to help consumers and builders pick the most energy-efficient and cost-effective window for a given application. RESFEN calculates the heating and cooling energy use and associated costs, as well as the peak heating and cooling demand for specific window products. Users specify their house type (single or two-story), geographic location, orientation, electricity and gas cost and building configuration details (such as wall type, floor type and HVAC systems). The program compares relative energy and cost impacts of two different windows.

Local resources

Check with your utility company to see if they offer incentives for your retrofit project. Lastly, your state may offer financial incentives to improve energy-efficient building practices in commercial structures. ⚡

For links to more resources, visit <http://ww2.wapa.gov/sites/western/es/pubs/esb/Pages/esb4.aspx>

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early registration is recommended. Download and fill out the registration form, and fax it to Stevie Moe at 866-484-2373 with your check or money order made out to Clean

Energy Ambassadors. The form includes hotel suggestions if you are coming from out of town and need lodging. You can also email Moe with questions, or call her at 406-969-1040.

Finally, if the Rocky Mountain Region IR workshop sounds

great, but is too far away for you to attend, contact your Energy Services representative about scheduling an event in your area. As we said, Energy Services doesn’t play favorites—we want all our customers to discover the benefits of IR cameras. ⚡

For links to more resources, visit <http://ww2.wapa.gov/sites/western/es/pubs/esb/Pages/esb3.aspx>

Website of the month:

Nebraska Public Power District GreenTouchscreen

It is always a pleasure to feature a Western customer's website in this column, particularly one as fun as GreenTouchscreen, created by Nebraska Public Power District (NPPD).

GreenTouchscreen is the educational component of the Norfolk Operations Center (NOC), a LEED Gold facility NPPD opened in 2010 to enhance customer service and gain operational efficiencies. NPPD's goal is to provide the public—particularly its customers—with an interactive tool for learning about energy use and ways to minimize its impact on the environment. Although it is designed with touchscreen devices in mind, the GreenTouchscreen works just as well with “old-fashioned” computers, too.

NPPD's Norfolk Operations Center incorporates green and sustainable construction methods, operation and maintenance features, and highlights renewable energy generation and public education efforts like the GreenTouchscreen. (Photo by Nebraska Public Power District)

The content is divided into five categories:

- Our Mission
- Alternative Fuels
- Stewardship
- Renewable Resources
- Energy Efficiency

Users pull up the icon menu by hitting the Explore button, and may choose topics pertaining to each category.

More than a mission

To its credit, the Mission section dispenses with the dry, long-winded statements that bog down so many business websites. A few short



NPPD's Norfolk Operations Center incorporates green and sustainable construction methods, operation and maintenance features, and highlights renewable energy generation and public education efforts like the GreenTouchscreen. (Photo by Nebraska Public Power District)

sentences lay out the utility's vision, mission and values, and a short video features CEO Ronald Asche introducing the concept behind the NOC project.

The rest of the topics in this section provide an overview of NPPD's operations in concise, well-organized text supported by easily understood graphics and illustrations. The pages labeled Knowledge and Grid are especially good for explaining the basics of power delivery, and would make a great classroom tool.

Clean energy resources

The Renewable Energy section opens with an energy overview describing the reasons NPPD is committed to clean energy. The paragraphs on this page that explain the factors determining the cost of energy seem misplaced, especially since the accompanying pie charts are for coal, nuclear and natural gas.

The resources highlighted in this

section are wind, hydro and solar power—all part of NPPD's portfolio. “Other Renewable Resources” briefly covers geothermal, biomass and tidal power. Interactive diagrams on the hydro and solar pages showing how the generators work lack sufficient detail to be very helpful to younger visitors. The wind page offers an animated video that is more informative—probably not surprising, given NPPD's successful wind power program.

Perhaps the best page in the renewable resource section is “Live Data,” which shows the output of NPPD's renewable systems in real time. There are also tables of historical data for electricity use by lighting, geothermal heat pumps and electrical outlets.

The cheapest watt

The first icon in the Energy Efficiency section is entitled “What We Can All Do,” a straightforward

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Website of the month *from page 6*

explanation of why a utility would promote energy efficiency and conservation. Public power customer service representatives may want to visit this page just to borrow the language for the next time they have to answer that question.

Visitors don't have to be NPPD customers to use the tools in this section. The water use calculator shows how much water consumers can save by replacing standard toilets with more efficient models. The carbon footprint calculator estimates the user's carbon emissions based on several simple questions, and the CFL tool calculates electricity savings from replacing conventional lights with compact fluorescent lamps. "My House" is an interactive map of a home that offers tips for reducing energy use in every room of the house.

"NPPD Programs" is ostensibly only for NPPD customers, but it is, nevertheless, an entertaining illustration of how the programs put off the need to build a new power plant. Maybe the outside audience for this page should be energy program planners at other utilities, rather than consumers.

Teachers everywhere can use the

Physics page to demonstrate principles of energy, in both theoretical and practical terms. The interactive illustration, "Transformation of Energy" offers simple examples of different types of energy, while "Energy Life Cycle" shows how much energy aluminum can recycling can save.

Other energy issues

In keeping with the broad scope of sustainability, GreenTouchscreen has sections that cover issues that are less directly related to generation and transmission, but still very much concern utilities and the communities they serve.

The Alternative Fuel section might have been more accurately named "Transportation," since it addresses this key part of building a sustainable future. The topics here look at some of the technologies currently available to replace fossil fuels in transportation. Ethanol, fuel cells and hybrid automobiles each get their own pages, and "Other Fuels" covers some additional alternatives, such as compressed natural gas and biodiesel. The pages give a brief description of the technology and list research and challenges related to each fuel. Like

the rest of the content on the site, this information targets the general public with a good working explanation of the concept of alternative transportation fuels.

To learn more about the sustainable features of the Norfolk Operations Center and Energy Innovation Project, visitors can explore GreenTouchscreen's Stewardship section. The building is the first project of its kind in Nebraska and boasts educational features such as three wind turbines, a solar panel, walking trails and an interactive kiosk. The LEED page details the measures that earned the building its Gold certification, and interactive maps show the location of the green features on the building and the grounds.

NPPD's Norfolk Operations Center is an impressive project, and GreenTouchscreen is a great way to involve and educate the communities NPPD serves. A good website, whether simple or complex, is among a utility's most effective outreach tools. Let us know how your website has improved customer communications—you just might see it featured in the next Energy Services Bulletin.



For links to more resources,
visit <http://ww2.wapa.gov/sites/western/es/pubs/esb/Pages/esb5.aspx>

Infrared Thermography

Hands-On Training for Utility Systems and Customer Service Applications

For more information, contact Stevie Moe, smoe@cleanenergyambassadors.com
or 406-969-1040

August 8, 2012
8:00 a.m. to 5:30 p.m.
United Power
500 Cooperative Way, Civic Room
Brighton, Colo.



Wind awards

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relationships with landowners, county officials and other stakeholders. The project made a concerted effort from the beginning to procure equipment and components manufactured in the United States. The construction agreement between MMPA and its contractor provided an incentive to bring the project in under budget. Customers discovered the benefits of wind generation firsthand in the form of clean energy at a fixed price, local jobs and new revenue for landowners. Also, Oak Glen's innovative ownership and financial structure qualified the project to receive a \$25.4 million federal grant. "That helped put MMPA on the same footing as privately-owned utilities," Er said.

He added that the most important thing the joint action agency learned from developing wind is that smaller utilities such as MMPA can innovate and be leaders in community relations and financing approaches. "You have to think outside the box and ask yourself 'What can we do for the ratepayer?'" Er explained. "And then you have to take bold steps."

Each winner of the 2012 Wind Public Power Award was willing to take bold steps on behalf of their



MMPA is the first municipal power agency in the country to install a wind turbine in each of its member cities. (Photo by Minnesota Municipal Power Agency)

ratepayers, and their communities have been rewarded with job creation, a cleaner power supply and greater energy security. Awards may be just the icing on the cake at this point, but Western is still very proud to call these wind power leaders our customers. ⚡

For links to more resources, visit <http://ww2.wapa.gov/sites/western/es/pubs/esb/Pages/esb1.aspx>

Great River Energy

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will have access to the web portal to follow their energy use, and advanced-control water heaters with two-way communication will be installed in 10 households. MVEC will be placing the storage batteries with several customers to use as back-up power during peak demand—no homes will be going off-grid.

In the Lake Region service area, the co-op will seek 100 volunteer households to sign up for "peak-time rebate pricing"—their electricity bill will be credited based

on the actual amount of energy they are able to reduce during Great River's peak times. The in-house data displays will alert customers to peaks, so they have the opportunity to shift power use during these times.

Ed Jenson, LREC vice president of engineering operations, noted that the co-op would be looking for volunteers who were not currently enrolled in Great River's load control program. "We'll get a better idea of how the information affects consumer behavior if we aren't working with people who are already paying attention to their energy use," he said.

Jenson doesn't expect any

difficulty recruiting participants for the two-year pilot. "Customers who take part in the demonstration will receive an incentive rate," he said. "There is no risk to the customer and the project gives them the opportunity to earn money back without an investment."

The real reason co-op customers are likely to get involved in the smart grid pilot program may have less to do with incentives than with trust, however. Great River and its member systems have a long history of working closely with their customers to keep energy prices down, "And that's something we really take pride in," said Webster. ⚡

For links to more resources, visit <http://ww2.wapa.gov/sites/western/es/pubs/esb/Pages/esb2.aspx>