Energy Services BULLETIN
April 2005
Western's bi-monthly energy efficiency and renewable energy newsletter dedicated to customer activities and sharing information on energy services.

Partnership turns former City Hall into efficient living space

After more than 30 years of sitting vacant in downtown Kansas City, Kan., the old City Hall building is about to get a new lease on life as trendy—and energy-efficient—loft apartments.

The non-profit community development corporation City Vision Ministries formed a development partnership with Bank of America and Kansas City Board of Public Utilities to restore the historic building and provide affordable, mixed-income housing in downtown Kansas City.

The partnership spent two years putting together a $7.5 million financing package that included Federal and state historic and housing tax credits. BPU is contributing incentives and electricity-saving expertise to the renovation project.

What's inside

The Historic City Hall building in Kansas City, Kan., is being converted to distinctive, energy-efficient loft apartments by a redevelopment partnership. (Photo by City Vision Ministries)

Historic architecture, modern efficiency

Ground broke on construction in May 2004, and pre-leasing began last month. The top-level apartments should be ready for occupants in May or June, with the entire renovation completed by August.

When completed, the 42 loft apartments will retain most of the 1930s-era architectural and decorative features of the original building, like hardwood flooring and ornamental plaster.

To bring the historic building into the 21st century, BPU is putting in new electrical service and submetering to each unit. Each tenant will have an electric hot water and a high-efficiency, all electric heating and cooling system offering individual climate control to each apartment.

Under BPU's Builder Incentive Program, the project will receive rebates for installing split-system, add-on heat pumps in each unit. Other efficiency measures include new windows and increased insulation. The structural upgrades and BPU's electric heating program could save tenants as much as 60 to 70 percent on their heating and cooling costs compared to standard efficiency natural gas with electric cooling. That makes an attractive building even more appealing.

Programs grow load

Incentives for builders and developers have helped BPU, a summer-peaking utility, build its winter load while helping consumers keep electric bills down. Developer incentives provide allowances for underground

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Wind group creates technical resource for utilities

Wind power has come a long way since the first modern turbines started spinning, and the issues surrounding the resource become more complex with each new project. Fortunately, the Utility Wind Interest Group , an organization dedicated to power providers' concerns regarding wind issues has grown with the technology.

Utilities, researchers learn

UWIG operates in collaboration with the U.S. Department of Energy and the National Renewable Energy Laboratory .Nebraska Public Power District , an early member, became active in the group through the joint EPRI/DOE turbine verification program. "It helped us to understand the issues involved in tying an intermittent power source to the grid," said NPPD Director Gary Thompson

DOE and the Electric Power Research Institute approached utilities that had, or were planning to add, large wind plants to get the industry perspective on the emerging technology. "They realized that their funded projects needed to factor in utilities' real-world concerns," said UWIG Executive Director Charlie Smith .

The utilities were looking for a way to gauge the long-term impact wind generation was going to have on their systems. In 1989, the group formed UWIG, recalled Smith, to educate themselves. "We held quarterly meetings where wind developers and turbine manufacturers gave presentations, we discussed the issues and we visited sites," he said.

That research became UWIG's first resource publication, a series of brochures addressing wind issues for a utility audience. Topics covered in the series included wind forecasting, integration, land use and European experience with wind. The printings of 10,000 each were snapped up by utilities eager for an information resource dedicated to their concerns. "It was very popular because it filled a real need at the time," Smith said.

The Utility Wind Interest Group was founded in 1989 to help utilities learn about wind power and associated issues. (Artwork by UWIG)

New issues

UWIG's membership has grown and now boasts 68 members that include industry, government and academic organizations, as well as utilities.

Western joined UWIG in 2000 to support the group's mission. "It's a good organization because it gives electric power providers a forum for defining the industry's needs," said Western Renewable Resource Program Manager Randy Manion.

Those needs have grown more specific as the technology has evolved. For members like Great River Energy, the operating cost impact of large wind farms on systems is a leading concern. The Minneapolis power wholesaler is bringing a 100-MW wind facility online this summer and plans to add 400 MW more of wind generation over the next four years.

UWIG undertook a sponsored research study to determine the integration cost and operating impact of wind plants on utility systems, resulting in a landmark study on the topic and a broad range of follow-on efforts.

Hot topics

A research project on distributed wind work, another priority for utilities, created a measurements database, case study library and engineering software tools to determine the impact turbines might have

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.

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on voltage regulation, flicker and overcurrent protection and safety. Utilities can use the resources for distribution system planning, design and operation with radial distribution feeders.

There are four working groups collecting, studying and analyzing information about topics currently of greatest interest to UWIG members. The priority topics are operating impact and integration, distributed wind applications, wind plant modeling and interconnection, and market operation and transmission policy best practices. DOE and NREL are active participants in the groups.

More groups will likely arise as the issues—and the membership—continue to evolve. "More regional transmission operators and international organizations are joining," said Thompson. "It's fascinating to see how the meetings and workshops have grown in scope."

Utilities will have the opportunity to participate in one of those comprehensive events at UWIG's upcoming annual meeting and Wind Integration and Interconnection workshop . The meeting and workshop are scheduled for the week of April 11 in Minneapolis, Minn.

Utilities still have a lot to learn about wind technology and issues like interconnection, integration and marketing. The Utility Wind Interest Group is there to help power providers get a jump on the learning curve.

Industry groups like UWIG exist for all types of renewable energy technologies, and are a valuable resource for utilities. Visit the Public Renewables Partnership Web site for a list of organizations and contacts.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2005/apr/apr052.htm

City Hall

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electric distribution systems in subdivisions.

Rebates for builders cover add-on heat pumps, electric hot water heaters and lot hook-up charges. There are also incentives for building all-electric apartments and installing all-electric kitchens in new homes.

Residential customers may be eligible for rebates for retrofitting their homes with heat pumps. Businesses can receive incentives for converting from gas-and-electric to all-electric systems as the General Motors plant in Kansas City did by replacing a gas-driven turbine with an electric motor.

In the last four years, incentives have helped drive the installation of 64 MW of electric heating in BPU's service territory. With the price of natural gas going up, electric rates have become very competitive. Super-efficient heating equipment makes it an even better deal. It's good for BPU customers and good for Kansas City.

New business opportunities

BPU believes that supporting urban redevelopment is also good for the community. The old City Hall is only the latest collaboration between the utility and City Vision Ministry. In 2002, BPU worked with CVM to build Turtle Hill Townhomes, an energy-efficient town home development that increased home ownership in a rundown neighborhood by 25 percent.

CVM plans to convert several vacant commercial buildings, including the former Kansas City Kansan newspaper building, into 300 loft units in the downtown district over the next five years. Distinctive, energy-efficient and centrally-located living spaces will attract new residents to the area, and those residents will create the need for additional new businesses.

BPU welcomes the partnership opportunities, as General Manager E. Leon Daggett said in a press release on the City Hall project. "Partnership efforts to support urban area redevelopment bring continued growth and community improvements."

Those are words that any utility can live—and grow—by.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2005/apr/apr051.htm

Rural Iowa utilities welcome large ethanol plants

That loud boom coming from Iowa cornfields is the sound of the ethanol industry turning the state into the No. 1 producer of the corn-based gasoline additive. And the outburst is followed by the buzz of rural utilities recalculating their loads and developing services to meet the needs of their new customers.

Corn Belt Power Cooperative serves three member co-ops with new and expanding ethanol plants in their service territories. Iowa Lakes Electric Cooperative ,Glidden Rural Electric Cooperative and Midland Power Cooperative are benefiting from—and facing the challenges of—providing service to these large industrial accounts.

"The plants require anywhere from 5 to 10 MW," said Jim Vermeer, Corn Belt's vice president of business development. "It's had a huge impact on our member cooperatives' loads."

Co-ops' loads grow

ILEC, in Lakota, serves an expanding plant, Midwest Grain Processors. The facility's expansion will boost its capacity from 50 million gallons per year to 95 million gallons, and grow its electrical load from 5 to 9 MW.

Midwest is not ILEC's only industrial account but it is the largest, for now. US BioEnergy's new 100-million-gallon plant being built near Albert City will be a 10-MW customer when it is operational.

The 40-million-gallon-per-year, 5-MW Tall Corn Ethanol plant in Coon Rapids is Glidden REC's only large industrial customer. Tall Corn doubled Glidden's load and required a dedicated substation.

The plant is currently expanding to increase its ethanol production 20 percent and add other by-products. The upgrade will double the facility's load to 10 MW and require another substation.

In the last four years, Corn Belt has built four dedicated substations for its member co-ops to accommodate ethanol plants, with two more now under construction. "We bring the substations to the load—not all utilities do this," Vermeer explained.

Midwest Grain Processors facility, served by Iowa Lakes Electric Cooperative, expanded from a 5-MW load to a 9-MW load. (Photo by ILEC)

Building relationships

Midland's first ethanol plant customer, Iowa Falls Ethanol , began producing early this year. "We've had large customer experience, but the plant is a significant addition to our load," said General Manager Roger Wieck .

Iowa Falls' ethanol engineers worked with the co-op during the initial startup of the plant to perform a thermographic inspection of the facilities. "We arrange for Corn Belt staff to conduct thermographic inspections," Wieck said. "It's a good way to create better efficiency from the beginning."

About four years ago, Corn Belt invested in its own infrared camera like the ones Western customers can borrow through the Equipment Loan program . The power wholesaler's technical staff performs thermographic analysis for its members' new key accounts. "This program has turned out to be very popular," said Vermeer.

Thermography inspections are part of Corn Belt 's key accounts program. The power wholesaler's member systems provides their key accounts with a single point of contact for improving energy management and resolving electrical service issues. The program also reimburses member utilities for time worked with key accounts and some expenses incurred in servicing them.

"Ultimately, it's about building relationships," Vermeer asserted.

New strategies

Keeping key accounts happy has been good for Iowa's electrical co-ops, but success comes with a price. "We are experiencing growing pains," Vermeer admitted.

Corn Belt became a minority investor in a power plant being built by MidAmerican Energy Company about two years ago to secure 42 MW. Corn Belt's load has outgrown that alloca-

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Want to know more?
Visit www.wapa.gov/es/pubs/esb/2005/apr/apr053.htm

Hog farm adds wind to renewable energy collection

The partners who gave the world the first microturbine powered on biogas from hog waste have teamed up again to show how renewable energy can cut agriculture businesses' bottom line.

The Colorado Office of Energy Management and Conservation and Colorado Pork, LLC, have installed a 65-kW wind turbine to complement the Lamar, Colo., hog farm's combined heat and power system. TriState Generation and Transmission and Southeastern Colorado Power Association are once again contributing technical assistance and collecting data.

Project partners learn

"We would like to get other farms interested in using these technologies," said OEMC Senior Deputy Director Ed Lewis. "To do that, you have to show how the systems work, how well they work and what they are going to cost."

The turbine will give Colorado Pork the chance to see how an intermittent power source combines with its CHP system. The farm now gets about 24 kW from the biogas-powered Capstone microturbine. Although that is less than the wind turbine's 65-kW rating, "Wind only generates about one third of the time," noted Lewis.

The interconnected turbine will help the farm's power providers identify and address issues from contract provisions to safety equipment and procedures.

TriState Senior Engineer Mike McCoy observed that the demonstration process is very important for moving any renewable technology forward. "With the anaerobic digester project, we discovered 999 ways not to run a CHP system," he recalled. "We haven't done that much small wind in Colorado, so we need to go through that process," he added.

Small wind

The gap in experience is not for lack of resources. Southeastern Colorado's average wind speed of more than 13 miles per hour supports Colorado Green, the state's largest wind farm. OEMC and Colorado Pork collected data from a wind anemometer on the farm for one year and compared it to data from Lamar's large anemometer.

Lewis hopes that the latest phase of the Colorado Pork project will encourage the region's agricultural community to take a greater interest in renewable energy. "The cost of an anaerobic digester system can be daunting to a smaller operation," he explained. "Wind turbines are relatively inexpensive by comparison, and easier to install."

Using a refurbished Vestas E15 wind turbine from Energy Maintenance Service, the total installed cost of the unit is $85,000, including all electrical connections. With no credit for peak reduction, the wind turbine has an estimated payback of eight to 10 years.

Education resources

OEMC funded this project, and plans to highlight it in educational workshops throughout the agricultural community. A video presentation explaining small wind power and the installation of this turbine is also in the works.

Jack Wolfe of Southeastern Colorado Power Association checks the output of Colorado Pork's reconditioned 65-kW wind turbine. (Photo by TriState Generation and Transmission)

There will soon be more data to add from another addition to the CHP system, a Stirling engine with a nameplate capacity of 55 kW. Like the microturbine, the external combustion Stirling engine will run on biogas. The Stirling will move the hog farm closer to generating its entire 100- to 196-kW load.

The new engine also presents another renewable energy opportunity for cutting operating costs. "Since heat drives the pistons, a concentrated solar array could heat water to run the Stirling," Lewis conjectured.

For the partners in the Great Colorado Pork Renewable Energy Experiment, it's another day, another demonstration.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2005/apr/apr054.htm

Growers pair solar power with wine to mellow electric bills

California wineries are discovering that modern photovoltaic technology can extract yet another commodity from the sun: clean, inexpensive electricity.

Encouraged by Federal, state and utility incentives, vineyards in California's Napa and Central valleys have almost become their own niche market for solar power systems. "Growers can make the commitment to the eight- to 10-year payback on solar systems," said David Lucas of Lucas Winery near Lodi, in California's Central Valley. "For a homeowner in the suburbs who moves every five years, a solar system may not seem like a good investment."

Renewable Technologies, Inc. installed this 5-kW, ground-mounted PV system at Bokish Vineyard in California's Central Valley. (Photo by Renewable Technologies, Inc.)

Consumption matches generation

There are more reasons why wineries make excellent candidates for solar power systems. Most have the square footage for ground mounting, and buildings with large roof space.

California's net metering program fits into the seasonal nature of winemaking. Solar systems are at peak production in late summer and early fall. "At harvest and crush, we're running at peak consumption," said Facilities Manager Jim Magness of Rodney Strong Vineyards.

Last year, Rodney Strong installed a 766-kW, 4,032-panel array on top of its 100,000 sq. ft. barrel warehouse near Healdsburg, Calif. The vineyard averages about 160,000 kWh per month, though power use drops in the winter, as it does for most growers. Then the company can get credits for the excess electricity from Pacific Gas and Electric Company.

"We wanted to reduce our energy costs during peak periods," said Magness, "and we thought it would be the 'green' thing to do."

Lucas too, has an eye on both the bottom line and the environment. The 160-panel array mounted on his winery's main building is expected to supply all its electricity, making Lucas the first 100-percent solar-powered winemaker in Lodi. "It contributes to the pocket book, but it's also the right thing to do," Lucas explained.

Incentives cut first costs

From the pocketbook standpoint, state and Federal incentives support winery PV systems. "Cost-sharing and tax benefits are very important for driving adoption of renewable technology," said Mark Chandler, executive director of the Lodi-Woodbridge Winegrape Commission.

A mix of state and Federal incentives paid for about half of the $4.2 million the Strong system cost. "We're looking at a nine- to 10-year payback on the system," said Magness.

Lucas also expects to recoup his $166,000 investment in about 10 years. He hopes the excess generation credits will cover the 3,000-sq.-ft. winery's annual electricity costs of $6,000 to $8,000.

Some California consumers can take advantage of the Self-Generation Incentive program created by the state Public Utilities Commission or the California Energy Commission's Emerging Renewables Rebate program

Growers outside the state may be eligible for US Department of Agriculture funds for renewable energy

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Arizona meeting promotes state wind development

The Arizona Wind Working Group wants to make sure that wind energy claims its rightful place in the sun-drenched state's renewable power portfolio.

Attendance record

In January, the organization and its sponsor, Northern Arizona University , hosted a day-long symposium in Tempe, Ariz., on developing the state's wind resources. "Wind Energy in Arizona: Resource to Reality" brought together 125 representatives from state agencies, private development and utilities to look at the state's current wind activities, potential and barriers.

This symposium was AZWWG's best-attended ever. Conference Director Amanda Ormond attributes the success to good timing. "The National Wind Coordinating Committee was holding a business meeting in the hotel the next day," she explained.

The goal of the conference was to raise awareness about wind energy and its benefits among Arizona's power industry and policy makers. "The most important points are that Arizona has a developable resource, and that developing wind will be good for the state's economy," Ormond said.

Resources, need exist

Arizona has enough areas of class 3+ or higher resources to generate 22,600 MW, according to Steve Clemmer of the Union of Concerned Scientists. Clemmer noted that a tough renewable energy standard of 20 percent by 2020 would also bring high-skilled jobs and millions in income to the state.

Job creation and economic development are critical concerns in the rural areas where most of Arizona's resources are located. "The places that have the wind are the ones that really need the benefits," noted Ormond.

John Stulp, a county commissioner from Lamar, Colo., offered the Colorado Green Wind Farm as an example of what wind development could do for a small town. Construction of the 108-turbine facility in southeastern Colorado was a $200 million investment that employed 400 workers. The wind farm created 14 to 20 full-time jobs, increased Prowers County's assessed tax value by 33 percent and paid landowners $3,000 to $4,000 per turbine for property use.

Wind development on reservations could bring many of those benefits to Native American tribes.

Next steps

The conference ended with a panel discussion that summed up the opportunities for wind energy in Arizona and the challenges the industry faces.

A developable resource coupled with the state's growing power demand and the need for rural and tribal economic development give Arizona the basic elements to build a wind industry. The state's renewable portfolio standard and favorable regulatory climate, as well as the Federal production tax credit, further support new development. Also, the Palo Verde hub on the west side of the state provides good access to California energy markets.

To the east and north, however, Colorado and New Mexico have greater wind resources. The scattered location of Arizona's resources makes them difficult to develop. There is no overall state strategy for renewable resource development or a streamlined process to develop wind on State Trust lands. Transmission issues and the intermittent nature of wind also challenge Arizona.

Panelists recommended expanding the renewable standard to 1,000 MW and creating a centralized Web resource of state-specific wind information. Stakeholders and advocates should work together to build support for wind among policy makers, they said. The panelists supported launching a project in 2005 to take advantage of the production tax credit.

Each type of renewable resource comes with technical, logistical and marketing challenges, and geography complicates the equation. State-based organizations like the Arizona Wind Working Group provide a valuable forum for finding answers that will help each region make the most of all its renewable resources.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2005/apr/apr056.htm

Efficient spray valve saves restaurants water, money

The low-flow, pre-rinse spray valve may be the new magic bullet in water conservation. Restaurants and cafeteria kitchens use pre-rinse spray valves to rinse off dirty dishes before running them through a dishwasher. Standard spray valves or nozzles use more than three gallons of hot water per minute, plus the energy that goes into heating the water. Low-flow valves, by comparison, use only 1.6 gallons per minute.

A new spray valve costs between $30 and $50, about $5 more than a standard valve. Each low-flow valve saves more than 50,000 gallons of water annually, plus heating costs. Where natural gas is the heat source, the payback for replacing a standard valve with a $50 low-flow valve is two months or less.

Cost-free to customers

The figures come from the Rinse and Save program, launched by the California Urban Water Conservation Council in 2003 to get the food service industry to install the equipment. "This is one of the best programs we've ever done," said CUWCC Program Manager Maureen Erbeznik. "It's simple, and the savings are huge.

Funded by a $2.2 million grant from the California Public Utilities Commission, CUWCC bought the low-flow valves in bulk from Fisher Manufacturing. The Fisher valve had been tested by the Food Service Technology Center in San Ramon, Calif. "The Fisher valve was the only one that met all the specifications," said Erbeznik.

She added that two more products meeting the standards are now available, a valve by Niagara Plumbing Supply and one by T&S Brass.

In phase one of the Rinse and Save program, the valves were to be distributed and installed, free of cost, to commercial food service businesses throughout the state. Western customers East Bay Municipal Utility District, Metropolitan Water District of Southern California and Sonoma County Water Agency were among the utilities participating in the roll-out.

Personal approach

Despite the impressive performance of efficient spray valves, few businesses have installed them. After reviewing programs offering valves, CUWCC concluded that restaurants are generally run in a "heads down" manner—owners and managers deal with the work directly in front of them. They rarely respond to direct mail or attend industry conferences, so they don't learn about programs. If they do hear about an offer, they consider it too much of a hassle to participate.

To get around this obstacle, CUWCC used door-to-door canvassers to solicit participants and direct installation. "With direct install, we went from installing 60 valves a year to installing 20,000," Erbeznik recalled.

Forty percent of the eligible businesses agreed to participate. Between October 2002 and December 2003, program staff knocked on doors, installed low-flow valves and trained restaurant employees to use them. Low-flow valves spray in a flat, knife-like pattern different from the round spray of a high-flow nozzle. Once kitchen staff understood how to direct the spray valve, most agreed that it was more effective in removing food from dishes.

This low-flow, pre-rinse spray valve uses only 1.6 gallons per minute, compared to the three gallons per minute conventional valves use. (Photo by California Urban Water Council)

Savings inspire programs

The low-flow valve was even more effective at saving water, energy and money. Kitchens that used their spray valve two hours per day could save $300 to $400 annually with the low-flow model. The low-flow valve could save larger restaurants between $700 and $1,300 annually, depending on the number of hours used.

Restaurants using gas to heat water could save approximately one

therm per day. About two-thirds of the participating businesses used gas heat. The results were even more impressive for electric heat, saving owners 7,629 kWh per year. It is not surprising that 95 percent of the participants continued to use their new equipment after the study ended.

Phase two of the Rinse and Save program began July 2004 and runs to the end of 2005. CUWCC has distributed more than 5,000 valves so far and locked in 15,000 acre-feet of current and future water savings.

Elsewhere, Ontario, Florida and Washington state have started similar programs. The low cost of the equipment makes the low-flow valve an excellent candidate for local incentive programs.

California adopted a minimum efficiency standard for pre-rinse spray valves of a maximum flow of 1.6 gallons per minute. The standard takes effect in January 2006. Food service businesses will not be required to replace functioning older spray valves.

Arizona and Colorado, two states hit hard by drought, included the standard in appliance efficiency standards bills introduced in the 2005 state legislative sessions. In the West's dry climate—especially in urban centers with lots of restaurants—a conservation tool that costs a little and saves a lot has a bright future.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2005/apr/apr057.htm

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and energy efficiency projects. Department of Energy and Environmental Protection Agency funds also target farms and ranches for renewable application.

Solar still maturing

Funding may encourage agriculture businesses to adopt renewable energy, but other concerns must also be addressed if the momentum is to continue. Lucas would like to see more involvement and cooperation from utilities.

Chandler, who installed a solar-powered irrigation system at his Lockeford vineyard, cautioned growers about the growing problem of farm equipment theft. "Smaller solar equipment and ground mounted arrays need security systems," he said. "We've had to dismantle our system until we can figure out how to protect it."

Renewable energy faces broader issues that affect any young industry, added Darryl Conklin, president of Renewable Technologies Inc. His 10-year-old company installed the Lucas and Lockeforde systems. "The industry needs to standardize processes through best practices," he declared.

Conklin stressed the need for consumer education. Too often, he noted, customers take the low bid and wind up stuck. Equipment should come from established manufacturers and carry product certification, he added.

The benefits of renewable energy to agriculture customers continue to outweigh the concerns, however. As long as growers need to control operating costs, comply with environmental regulations and stay competitive in an international market, solar power will find supporters among California wineries.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2005/apr/apr055.htm

Iowa utilities

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tion. The utility is now evaluating new sources of generation.

Also, Corn Belt is studying demand side management as part of its integrated resource plan. "It's not a question of if, but when," said Vermeer.

Still, public power providers agree, what is good for the community is good for the utility that serves the community. "Ethanol plants create jobs and increase corn prices by 10 to 15 cents within a 30-mile radius of the plant," Vermeer pointed out. "And the real impact is that the plants return dividends on investments within the first year of operation."

If that means utilities have to do a little extra planning and program creation, Corn Belt Power Cooperative and its member systems are happy to oblige.

States set goals to increase renewable energy use

The mandated renewable energy requirement has crisscrossed the country, gathering a state legislature here and a public utilities commission there, until 18 states now have targets and timetables for using electricity generated from renewable resources.

The policies may look very different but all have the goal of maintaining or increasing the amount of renewable energy in the electricity mix. As a result, said Senior Energy Analyst Lori Bird at the National Renewable Energy Laboratory , "RPSs stimulate the development of new sources."

States adopt RPS

Western's territory holds the states with the earliest renewable energy mandates in the country. The Iowa Alternate Energy Production law passed in 1983, although enforcement provisions did not follow until 1996. The Minnesota legislature mandated renewable acquisition in 1994. Mandates require the construction of set amounts of new renewable capacity using specified technologies.

The newer RPS programs generally require that a specified share of electricity come from qualifying renewable technologies. Arizona, California, Nevada and New Mexico have RPSs. Colorado recently became the first state in the country where voters decided the issue, rather than a legislature or regulatory agency.

Ballot Initiative 37 requires Colorado's investor-owned utilities to obtain three percent of their electricity from renewable energy resources by 2007 and 10 percent by 2015.

Goals, deadlines differ

State requirements vary widely in the amount of renewable energy and target dates for reaching the goals. In California, renewable energy must make up 20 percent of the state's generation by no later than 2017. The Arizona RPS requires regulated utilities to generate a minimum of 0.2 percent of total retail energy sales from renewables in 2001, increasing to 1.1 percent by 2007.

Nevada's aggressive law phases in renewable energy use by increasing requirements two percent every two years, reaching 15 percent in 2013. Investor-owned utilities in New Mexico must provide five percent renewable energy by 2006, and increase one percent annually to 10 percent by 2011.

Iowa energy regulators set Feb. 9, 1997, as the deadline for utilities to sign contracts for 105 megawatts of renewable electricity. The state's renewable resources now generate 200 MW per year.

The Minnesota legislature mandated that Xcel Energy build or contract for wind and biomass power. The mandate was expanded in 2002 to require 1,125 MW of wind generation by 2010.

Programs show results

Passing an RPS is only the beginning, however. The Colorado Public Utilities Commission begins its rulemaking process this month. Power wholesaler TriState Generation and Transmission plans to be involved, even though it has only one member co-op affected by the new RPS.

"There are still a lot of unanswered questions," observed Communications Manager James VanSomeren. "For example, can utilities count existing renewable generation like the wind power we purchase from Platte River Power Authority."

"Some RPSs allow existing renewable generation because the states want to support those projects too," said Bird.

RPSs may also target a technology for development. "To stimulate development, standards often have provisions for less cost-effective technologies," explained Bird. "Otherwise, the utilities would just go for the least-cost option."

The provisions have had the desired affect in some states. Solar energy projects must comprise five percent of Nevada's RPS. Applications have poured into Sierra Pacific Power's rebate program for almost a full MW of solar power.

As a result of Minnesota's mandate specifying wind and biomass, the state will have at least 825 MW of wind energy and 125 MW of biomass power by 2006. Iowa has 250 MW of wind installation, exceeding its original mandate of 105 MW.

Arizona's RPS has supported seven MW of solar and more than 10 MW of landfill gas and biomass. State utilities have contracted for 15 MW of wind and 20 MW of geothermal.

Pitfalls, solutions arise

Development has posed different challenges in different states, and given rise to a number of solutions. A major obstacle for many standards is a lack of long-term power

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Award recognizes Western's role in green power purchase

There is nothing quite like getting an award for doing something you wanted to do anyway. That's what happened when Restructuring Manager Bob Kennedy and Renewable Energy Manager Mike Cowan received the Presidential Award for Leadership in Federal Energy Management on Western's behalf.

The FEMP award recognizes Federal employees for outstanding achievements in:

- Conservation and efficient use of energy and water
- New and emerging energy technologies
- Innovative strategies, best practices and applications
- Renewable energy sources
- Alternative financing
- Energy-efficient mobility by the Federal government

Western coordinated the purchase of renewable energy certificates for the EPA's Region 7 Headquarters in Kansas City, Kan. (Photo by Environmental Protection Agency)

Partnership helps EPA

The Environmental Protection Agency earned the award for acquiring renewable electricity for its facilities. Kennedy and Cowan were part of the team that coordinated the purchases. Other partners in the Green Power Purchase Program included the National Renewable Energy Laboratory, the General Services Administration, Department of Defense's Defense Energy Support Center and DOE's Federal Energy Management Program.

Western managed the solicitation and provided contracting services for procuring renewable energy certificates for EPA facilities in Kansas City, Kan., Denver and San Francisco. NREL provided technical support for the purchase.

"It was a really good experience working with the team," said Kennedy, who is based in Western's Rocky Mountain Regional office. "EPA was very pleased with our work."

Interagency cooperation

Justin Spenillo of EPA's Sustainable Facilities Practices Branch, agreed. "Western's business expertise was very valuable in helping EPA grade the offers from vendors," he said. "Going through a Federal power marketing authority eliminated unnecessary delays in the procurement."

Over the last five years, EPA green power purchases have grown to about 75 percent of its electricity needs—the highest percentage of any Federal agency. The purchase for the Denver, Kansas City and San Francisco offices was the first time the EPA worked with Western on a procurement. "Our first collaboration with Western benefited the EPA and Western, and the green power market as a whole," said Spenillo.

Western established its Renewable Resources for Federal Agencies program in 2003 to assist Federal agencies wishing to buy renewable energy. Western can buy and deliver renewable electricity directly to Federal customers. Sites where renewable power delivery is restricted may purchase renewable energy certificates instead. The certificates represent the environmental attributes of renewable power generation.

Local green tags

EPA chose to purchase certificates equivalent to more than 17 million kilowatthours annually.

Aquila, Inc. is supplying the certificates for EPA's Colorado and

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Goals

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purchasers. Without contracts, financing for construction is hard to obtain.

Two northeastern states are attempting solutions that other states may be able to adapt. New York is setting up a central procurement system to purchase renewable energy through competitive bidding. Connecticut is requiring utilities that provide standard offer service to sign 100 MW of renewables to long-term contracts.

Evaluating Experiences with Renewable Portfolio Standards, a paper published by Lawrence Berkeley National Laboratory, notes other pitfalls that can limit an RPS policy. Narrowly applied standards that exempt dominant providers in the market will have little effect on renewable development. Without sufficient enforcement provisions, providers may comply slowly or not at all. Without clear policy duration or stable goals, developers may have trouble obtaining long-term contracts.

The paper makes the point that most RPS programs are too new to judge their effectiveness. Legislatures and regulatory agencies are still learning how to balance programs to advance renewable markets while protecting consumers.

Even so, RPSs continue to gain popularity and followers. As more states adopt renewable portfolio standards or mandates, the best practices for getting that mix will emerge.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2005/apr/apr058.htm

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Kansas City facilities. The green power attributes for the Colorado facilities are coming from the Colorado Green Wind Project in Prowers County, Colo. The Gray County Wind Project near Montezuma, Kan., is generating the power that will provide certificates for the Kansas City Regional Office and the Kansas City Lab.

EPA's San Francisco Regional Office will receive green tags from geothermal energy provided by 3 Phases Energy Services and generated at The Geysers No. 11 in Middletown, Calif.

"Purchasing renewable power certificates encourages the growth of local renewable energy development," noted Spenillo.

Purchase builds experience

Another benefit of the purchase was the experience it provided to the participating agencies. It was Western's largest procurement to date under the Renewable Resources for Federal Agencies program. "This was our first multi-regional effort, and the first one where we were involved from the ground up," said Kennedy.

It won't be the last, he believes. "Western has a lot to offer Federal agencies that want to take advantage of those benefits."

For example, Western's contracting services are very customer-oriented, Kennedy pointed out. "You have to be flexible when dealing with other agencies' procedures," he said. "As a power marketing authority, Western has the experience to accommodate all those different factors."

Buying and selling energy is, after all, Western's business. Winning awards for being good at what we do is just icing on the cake.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2005/apr/apr059.htm

Western seminars take training resources to customers

Training gives people the tools to do a better job, whether that means learning about a new technology, increasing efficiency, solving a problem, improving customer relations or all of the above.

That's why training seminars are such an important and popular part of Western's Energy Services' technical assistance. Western regularly offers hands-on workshops and other training, usually in collaboration with customers and other organizations.

Recent workshops Western has sponsored include:

- Lighting 101 with DOE's Rebuild America program
- Expanding the Role of Renewables in an Energy Supply Portfolio with American Public Power Association's DEED program , U.S. Department of Energy's GeoPowering the West Program and DOE's Wind Powering America Program
- The Sun is Rising on Energy Opportunities with the General Administration
- Your Compressed Air System

"With our information resources and DOE support, Western has access to expert speakers," said Energy Services Representative Peggy Plate of Western's Rocky Mountain Region.

Topics, location

Customers can suggest topics, or, "Workshops can grow out of a conversation, like the commercial auditing session Western is sponsoring in Cheyenne, Wyo.," Plate said.

She is working with TriState Generation and Transmission to set up a training session for its members' key accounts, May 31 to June 2.

Derek Hengveld, of South Dakota State University, speaks at the Commercial Building-Science Seminar in Sioux Falls, S.D. (Photo by East River Power Cooperative)

Hosting utilities usually choose the workshop's location and make arrangements for the meeting room. Seminars have taken place in big cities and small towns. Convenience is the key to attendance, Plate observed. "Western workshops bring the training into the community, so the participants don't have far to travel."

Western also initiates workshops when our staff identifies a need or wishes to raise awareness about a useful program. The Desert Southwest Regional Office has scheduled a training session on integrated resource planning for April 12. "The workshop will center on IRPs—why Western requires them, what the plans need to cover and how to do one," said DSW Energy Services Representative Dewey McLean.

Wider scope

While intensive training sessions are good for learning about new technologies and strategies, conferences with broad agendas are also valuable. Western is co-sponsoring a number of events this spring and summer to help customers stay current with industry trends.

DSW will exhibit at two events on April 7—the 2005 Energy Management Conference hosted by the Arizona Department of Commerce and at Tribal Energy Southwest in Las Vegas, Nev. "Exhibiting at meetings gives us the chance to talk with customers one on one," McLean said. "We can also create awareness about our resources among groups like the energy efficiency community."

The 25th Annual Utility Energy Forum, May 4 through 6 at the Granlibakken Conference Center in Tahoe City, Calif., will focus on renewable and energy efficiency technologies and applications in the utility and power industry. "It's a great place to learn about the latest developments in renewable energy, energy efficiency and customer service," said Energy Services Representative David Christy of the Sierra Nevada Region.

Plate is facilitating a small hydro session at the Colorado Renewable Energy Conference, June 9 to 11, in Ft. Collins, Colo. The theme of

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USDA announces grants

Agriculture Secretary Mike Johanns announced the availability of $14.3 million in grants to support the development of value-added agriculture business ventures and the development of renewable energy. The USDA will give priority to applications that dedicate at least 51 percent of project costs to bio-energy activities.

Grants are available to independent producers, agricultural producer groups, farmer or rancher cooperatives and majority-controlled, producer-based business ventures interested in:

- planning activities to establish a value-added marketing opportunity for an agricultural product (e.g. conduct a feasibility study, develop a business or marketing plan);
- acquiring working capital to operate a value-added business venture to better compete in domestic and international markets.

Applications must be received no later than May 6, 2005. Detailed information about application and program requirements is in the March 7, 2005, *Federal Register*.

New DOE Web site

The U.S. Department of Energy has launched a new Web site with detailed information and tips on saving money by developing smart energy habits.

Energysavingtips.gov provides practical links to help consumers:

- Shop by zip code for Energy Star appliances
- Find the lowest-priced gasoline in their neighborhood
- Compare the fuel efficiency of vehicles currently on the market
- Identify features to look for when buying a hybrid or alternate fuel vehicle
- Take advantage of various tax incentives and utility rebates that may be available from the Federal government, local communities or through state energy offices

Consumers can also access free software tools through the site to evaluate their home energy use and determine what they can save by adopting simple, energy-smart practices. These strategies could include upgrading old, leaky windows, installing a programmable thermostat or simply turning down the hot heater.

US solar potential

If government, industry and investors cooperate to bring down installed solar photovoltaic pricing, the technology has tremendous potential in the United States, according to two recent reports by industry consultants.

The Solar High-Impact National Energy Project report, by Clean Edge, Inc. and Co-op America's Solar Catalyst Group, outlines a Federal program that could create up to 580,000 new American jobs and generate up to nine percent of the country's total electricity needs by 2025.

PV Grid Connected Market Potential in 2010 under a Cost Breakthrough Scenario was authored by the Energy Foundation and Navigant Consulting, Inc. The report concludes that U.S. residential and commercial rooftop space could accommodate up to 710,000 MW of solar electric power. Total U.S. electricity-generating capacity today is about 950,000 MW.

Corporations buy green power

The World Resources Institute announced that members of its Green Power Market Development Group bought 62 megawatts of electricity from renewable energy sources over the past year.

The Green Power Group is dedicated to building corporate markets for green power. Members include Alcoa Inc., Cargill Dow LLC, Delphi Corporation, DuPont, FedEx Kinko's, IBM, Interface Inc., Johnson & Johnson, Pitney Bowes and Staples.

The group made green power purchases for more than 80 facilities in 18 states. Landfill gas generated

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2005/apr/apr05es.htm

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the conference is "Renewable Energy: Power for Sustainable Communities."

Sources of ideas

How do you decide what kind of workshop would be most useful to staff, customers or members?

Maybe one of the events mentioned above rings a bell, or scan the Energy Services calendar to see what other organizations are doing. Maybe member service representatives are hearing the same question over and over.

Plate suggests talking to your Energy Services representative. "We have lots of ideas," she said, "and we know what worked well for other customers."

Think about teaming up with other utilities for training on topics with broad applications, like marketing or IRPs. Such partnerships also help stretch Western's limited funding to reach more customers.

Ideas for workshops can be submitted online, or ask your Energy Services representative. Western cannot guarantee that it will be able to fund or facilitate every suggestion. "But we rarely say no to a good idea," admitted Plate.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2005/apr/apr0510.htm

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21 MW of power. DuPont and Johnson & Johnson will replace natural gas with landfill gas for onsite generation at several facilities.

Johnson & Johnson and IBM installed 2 MW of wind and solar power at their own facilities. Also, Staples is installing two 280-kW solar power systems at facilities in California.

NRECA honors OK co-op

Oklahoma, a state often associated with oil, is the home of this year's Wind Power Cooperative of the Year. Western Farmers Electric Cooperative received the award from the National Rural Electric Cooperative Association, its Cooperative Research Network, and the DOE's Wind Powering America Program at NRECA's 2005 annual meeting.

The Anadarko, Oklahoma-based generation and transmission cooperative was the first electricity provider in the state to sign a purchase power agreement with a wind power developer. The 20-year agreement with Blue Canyon Windpower LLC., the developer of the 74.25 megawatt wind project, provides energy to 19 rural electric cooperatives that serve approximately two-thirds of Oklahoma.

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/apr/apr05coe.htm**

TOPICS from the POWER LINE

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.

Resources give savings estimates for lighting, insulation measures

Question:

We need data on how much energy residential households could save by switching from incandescent to fluorescent light bulbs and installing adequate attic insulation. Do you have any publications or resources that would answer these questions?

Answer:

The following information pertains mostly to the whole of the United States; we have included some data on individual households as well.

Lighting

The first part of your question deals with switching from incandescent bulbs to compact fluorescent lamps, also known as CFLs. In general, CFLs consume about a quarter of the energy used by incandescent bulbs to deliver the same amount of light. The California Energy Commission Consumer Energy Center offers more information.

For a simple answer, add up all the wattage of the old bulbs and subtract the total wattage of the new CFLs. The difference is how much energy switching light bulbs saved. A consumer might not feel it would be cost effective to switch to more expensive CFLs for little-used locations like a guest bedroom closet, but the energy savings would remain about 75 percent, despite a very small savings in dollars.

Compact Fluorescent Lighting , published by the American Council for an Energy-Efficient Economy, gives more information about energy savings from switching to CFLs.

The most recent, complete study we found on the energy-saving potential of switching from incandescent to fluorescent lights was prepared in 1998 by the U.S. Department of Energy. The Energy Information Administration study found that: "If households replaced all incandescent bulbs used four or more hours per day with compact fluorescent lights, they could save 31.7 billion kWh annually, or 35 percent of all electricity used for residential lighting."

The EPA Energy Star program estimates that if every American home changed its five most used lights to Energy Star qualified lighting, each family would save more than $60 on annual energy costs. Moreover, the change would keep more than one trillion pounds of greenhouse gases out of our air.

Insulation

Your second question about the nationwide energy savings potential of installing "adequate attic insulation" was more difficult to answer because of the many variables involved:

- current level of attic insulation in existing houses
- climate zones
- home's number of levels
- size
- type of heat

Even the "adequate" level of insulation varies by climatic region. The Simply Insulate Web site, created by the North American Insulation Manufacturers Association in partnership with state and Federal energy and environmental agencies, lets homeowners look up recommended insulation by state.

The ACEEE Consumer Guide to Home Energy Savings advises that several factors affect individual household savings from insulation and other weatherization measures. Those include local climate and cost of energy, and individual heating and cooling requirements.

DOE's Insulation Fact Sheet gives full recommendations on insulation levels with explanations. The introduction notes that unless a home was constructed with special attention to energy efficiency, adding insulation will probably reduce utility bills. Even in a new home, adding insulation may reduce energy costs enough to pay for itself within a few years and increase the resale value of the house.

For more information or other energy questions, call the Power Line at 1-800-769-3756.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2005/apr/apr0511.htm