Energy Services BULLETIN
April 2004
Western's bi-monthly energy efficiency and renewable energy newsletter dedicated to customer activities and sharing information on energy services.

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Utilities that would like to start tree planting programs or increase awareness of good planting and care practices in their communities can get help through the National Arbor Day Foundation's Tree City USA program and the American Public Power Association's Tree Power program. (Artwork courtesy of National Arbor Day Foundation and American Public Power Association)

Tree planting programs benefit utilities, customers, communities

Spring, when a utility's fancy turns to thoughts of…planting trees. With Arbor Day just around the corner in most states, it's a good time to recall how much our leafy friends do for us and to look at a few programs Western customers use to keep their communities green.

The practical advantages of trees range from producing food and fuel to making retail and residential spaces more inviting. Healthy, mature trees can add up to 10 percent to a property's value.

Utility interest in trees lays at the intersection of commercial and environmental benefits. The United States Department of Agriculture estimates that trees properly placed around buildings can reduce air conditioning needs by 30 percent and can save 20 to 50 percent of energy used for heating. Saving energy decreases peak powerplant demand, while trees help absorb the CO^2 produced by fossil fuel-burning powerplants. It's no wonder that both the American Public Power Association and the National Arbor Day Foundation encourage utilities to develop strategies for planting and caring for trees in their service areas.

Tools for local action

APPA's award-winning Tree Power program is a nationwide effort by public power utilities to plant trees. While participating in the national Tree Power program, utilities design their own programs based on local resources and needs.

More than 215 APPA members, many Western customers among them, have participated in Tree Power since it began in 1991. Participants receive a kit that includes graphics and communication materials and resource lists for in-depth tree-planting information, including how to implement, promote and fund a tree-planting program. The regularly updated Tree Power Report offers helpful articles and tips for building programs.

At its annual national conference, APPA awards one active Tree Power member a $2,500 grant to enhance its program and presents Golden Tree awards to utilities that plant one tree per customer. The list of Western customers that are past Golden Tree winners is a long one. Missouri River Energy Services joined Tree Power in 1992, offering its member co-ops an incentive for each tree planted per electric meter served. By 1999, the MRES program had planted 125,000 trees and earned its Golden Tree.

Nebraska Public Power District

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Tree planting

from page 1

received the award for a program that focused on maintaining adequate clearance between trees and electric lines. The pruning, removal and replacement program removed trees that continually interfered with power lines and replaced them with shorter, slower-growing trees and shrubs wherever possible. "It helped control an expensive and necessary part of providing power while keeping the communities beautiful," said NPPD Media Specialist Jeanne Schieffer. "We're looking forward to promoting more planting in the coming year," she added.

Guidelines, training key

Abundant, healthy trees sometimes seem to utilities like an obstacle to providing reliable electric service. To show that trees and electric service lines can peacefully co-exist, the National Arbor Day Foundation cosponsors Tree Line USA with the National Association of State Foresters.

To become a Tree Line utility, a power provider must meet three requirements: have a program of quality tree care, provide annual worker training in quality tree care practices and offer a tree planting and public education program.

To help with the first requirement, the foundation offers two references that recommend best practices. "Pruning Trees Near Electric Utility Lines: A Field Pocket Guide For Qualified Line-Clearance Tree Workers and Trenching" and "Tunneling Near Trees: A Field Pocket Guide for Qualified Workers" cover tree care methods from root to branch. "A lot of our electrical system is underground now, and not everyone understands that what you do to the roots can be just as damaging, or more so, than what you take off the top," said Colorado Springs Utilities' Restoration Services Section Leader Phil Helvie.

Colorado Springs Utilities has been recognized as a Tree Line USA utility for nine consecutive years. "We make sure that all of our contractors and in-house staff have both guides," Helvie stated.

Plant wisely

The tree planting and education component of Tree Line USA gets consumers involved in making wise planting choices that will beautify the community while helping the utility avoid long-term operational costs.

The best way to encourage people to plant trees, most programs recognize, is to give them trees for free or at a reduced cost. Riverside Public Utilities, which participates in both Tree Line USA and Tree Power, issues a bill credit of up to $25 per tree for the purchase of up to five shade trees per year. Sacramento Municipal Utility District delivers healthy trees, stakes, ties and fertilizer at no cost to customers who promise to plant and care for them. When CSU crews remove an obstructing tree or shrub, customers receive a nursery voucher that includes planting.

Programs place a lot of emphasis on planting the right tree in the right place and replacing varieties that can interfere with power lines. Omaha Public Power District planted an arboretum next to one of its substations to show visitors what different trees look like at different stages. "That way, people can see why they don't want to plant a sugar maple, for example, near a power line because of the problems that type of tree can present," explained OPPD Public Information Manager Jeff Hanson. "We also do pruning demonstrations complete with mock lines."

CSU created a poster for nurseries showing the best trees for planting in areas where utility crews might have to work. Each spring, CSU customers receive a flyer in their bills with pruning and planting advice, and the utility sends a letter to local landscapers reminding them to "look up before planting trees."

On SMUD and RPU Web sites, customers will find lists of trees that qualify for the utilities' incentive programs, along with planting and care information. An instructional video, "Planting Your Shade Tree," is available to SMUD customers participating in the shade tree program. Most programs mentioned here work with area forestry experts to provide technical assistance in positioning and caring for the trees.

Energy Services Bulletin

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Visit www.wapa.gov/es/pubs/esb/2004/april/apr041.htm

Montana cooperatives team up to deliver better service

Although Northern Electric Cooperative and Valley Electric Cooperative have distinct characters, the utilities share many similarities: both get their power from Western customer Central Montana Electric Power Cooperative; they share the same union contract and, since 2000, the same general manager. "We also have the same attorney, auditor, outside contractor and lenders," Joint Manager Larry Tade pointed out. "Valley and Northern have so much in common that it just makes sense to work together to save money and effort."

Teamwork offers advantage

Small co-ops, in particular, have to look for ways to conserve human and capital resources. Northern Electric has 10 employees, 860 members and 1,200 meters, while Valley serves 1,290 members and 1,850 meters with only nine employees. Any plan that eliminates duplicated effort is good business for both utilities. New technologies that allow employees to work electronically from either office has made working together even easier.

Repair and maintenance equipment is a big investment for any co-op, so equipment sharing has proven to be a tremendous benefit of cooperation. For example, Northern has an excellent underground fault locator for finding breaks in underground electric cable. When Valley has an underground fault, Northern sends its crew and locator to the site and quickly finds the problem. "It's a lot easier than having to go it alone," said the general manager. "Of course, we keep track of what is being used where and cost that out appropriately to each co-op."

With adjacent service areas that cover a total of 7,600 square miles, sharing vehicles and travel expenses can be almost as significant as sharing service agreements, personnel and equipment. The co-ops belong to many of the same organizations, such as the Montana Electric Cooperatives Association, and Tade often represents both co-ops at out-of-town meetings. Trustees from both co-ops also attend meetings together, cutting down on travel costs.

Heavy residential users

Controlling operating costs is an ongoing concern for Northern and Valley, since like so many RECs, they serve towns and counties with shrinking populations. Farms and ranches make up the bulk of Northern's membership, with 80 oil wells adding a substantial commercial load. Use-per-member is also high in Northern's territory, averaging about 1,300 kW per month.

But small business is just as important to the co-op and the community. The Lefse Shack, manufacturer of a popular potato pancake in Opheim, Mont., was at risk of moving to Minnesota when the owners decided to retire a few years ago. Rather than let the jobs leave the area, Northern bought the company's stock. "It employs about 15 people, mostly farm wives, for nine months a year and puts $100,000 back into the community," said Tade.

Lineman Mike Wesely introduces a future lineman to the tools of the trade at a safety fair Valley Electric Cooperative sponsored. (Photo courtesy of Valley Electric Cooperative)

It's not a huge corporation, he admitted, but in an almost entirely rural community, that revenue makes a big difference.

Valley looks for load growth

Valley's membership is more diverse than Northern's, with a slightly different outlook, according to Tade. "It's like there is a magic line dividing the two territories. To the north, people are a little more traditional; to the south, they're a little more progressive and interested in new ventures to raise revenue."

A ranch and feedlot combination is the co-op's biggest load right now, but vacation cabins around Ft. Peck Lake are helping to maintain the residential base. A new warm-water fish hatchery being built near Ft. Peck will add a load about half the size of Valley's total present load when it opens in 2005.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2004/april/apr042.htm

Agralite fuels rural development with ethanol, vodka

Swift County, Minn., struggled with the same population shifts and changes in the agricultural industry that drained so many rural economies over the last few decades, until Agralite Electric Cooperative had an idea that would have far-reaching benefits for both the utility and the community it served.

Ethanol plant eyed

The idea was to launch a business that would bring new revenue into the Benson, Minn.-based REC and help to stabilize its members' electric rates. Chippewa Valley Ethanol Company grew out of that idea, and it more than lived up to its founders' hopes.

In the early '90s, Agralite General Manager Ray Millet and board member John Carruth were brainstorming potential economic development projects to build the utility's load.

Any project Agralite chose to pursue would have to create jobs and increase the community's tax base. An ethanol plant would do that and add value to local farmers' commodities, too—a big plus to a predominantly agricultural membership. There was also a good profit margin in delivering power to a manufacturing facility.

Many sign on to project

Millett and Carruth decided to take their idea to the co-op's board.

With a concept and business plan in hand, it was time to recruit support for building an ethanol plant. Former Minnesota Secretary of Agriculture James Nichols and Larry Johnson, an ethanol expert and state agriculture department contractor, lent their expertise to the effort. The group presented the proposal for the first time to Benson bankers and economic development professionals and got an encouraging reception. A meeting with grain elevator owners followed. "The grain elevators needed to buy into the project for it to succeed," said Millett. "We had to explain that the ethanol plant would not be competition to their business."

The plant wouldn't succeed without suppliers, either. Agralite used the local media to promote the project and to announce a series of public information meetings with producers in an 80-mile radius of the proposed site in Benson. "We held 26 meetings in 16 days," Millett said. "The response was really positive, so we knew we could move on to the next step—putting together financing."

Legislation, investments

Over the next few years, more than 650 producers, elevators and local investors became shareholders in the Chippewa Valley Agrafuels Cooperative.

Securing the loan was by no means a sure thing, Millett admitted. In fact, the St. Paul Bank of Cooperatives turned CVAC down on the first try. "The bank had seen some similar projects fail," said Millett, "and there was concern at the time that Minnesota's renewable energy production tax credit was going to expire."

Eventually, the state legislature extended the credit and the bank approved the loan.

One factor that helped to persuade the bank was that Delta-T Corporation, the design-build firm awarded the CVAC construction contract, was also an investor in the project. "Their design offered a lot of flexibility for expansion, both in capacity and product line," explained Millett.

Construction on the plant began in June 1995 and was completed in April 1996—ahead of schedule and well within budget. The Chippewa Valley Ethanol Company ground its first bushel of corn on April 26, 1996 and was producing ethanol at 100 percent of capacity within 30 days.

New partners, products

CVEC has returned a lot to Benson and the surrounding area since it produced its first barrel of clean, renewable fuel. The first year after the plant went on line, Agralite was able to reduce its electric rates. Ethanol production brought 35 new jobs to the town, pushed the price of corn up and turned Swift County from a net corn exporter to a net corn importer. "That means that more of what our farmers grow stays in the area and benefits the local economy," Millett said. "It was a win-win-win situation that proved that small rural communities have tremendous revenue potential."

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2004/april/apr043.htm

Elk River Powerplant turns dirty garbage into clean energy

Taking out the trash was cause for celebration last December when Great River Energy's Elk River power station converted its 4 millionth ton of solid municipal waste to electricity.

At a party held earlier in the fall to mark the milestone, the public, community leaders and other supporters toured the waste-to-energy facility and enjoyed exhibits, refreshments and a special program. "We wanted the people who were instrumental in the station's success to share in the achievement," said Wayne Hanson, Great River Energy's Minnesota generation manager.

Great River Energy supplies power to 28 cooperatives in Minnesota and Wisconsin, including several Western customers. Hanson operates and maintains existing, state-based generation sources for the Minnesota generation and transmission cooperative, 32 MW of which Elk River Station generates. That's not a huge power source, Hanson admits, but it is one that now qualifies as a renewable resource. "We worked with several county groups to get the state legislature to recognize waste-derived fuel as a renewable resource like solar, wind and biomass," he explained. "The statute passed last year," he added proudly.

Landfill restrictions

The municipal waste stream may conjure a less aesthetically pleasing image than solar or wind energy, for example. However, it is hard to argue with the wisdom of turning something we will always have (trash) into something we will always need (electricity). This is especially true of the Elk River Station, which diverts 300,000 tons of trash annually from landfills in Anoka, Benton, Hennepin, Stearns and Sherburne counties. Only 20 percent of the fuelstock returns to a state-approved disposal site in the form of ash.

Trash disposal is not enough for a waste-to-energy facility to qualify as a renewable power source; it must meet strict state regulations. Elk River Station does this with a state-of-the art combustion process, pollution control equipment to filter and scrub emissions of harmful gases and an emission monitoring system that allows the plant to make adjustments in the burning process.

Such an environmental record is especially impressive considering that Elk River Station began operation as a coal- and oil-burning plant in the 1950s. Great River Energy converted it to nuclear energy in the 1960s, switched back to coal and oil in the1970s and finally decommissioned the plant in the 1980s. "The Coal Creek Station went online with 1,100 MW in 1981, so we had surplus capacity." Elk River Station sat dormant through the 1980s until another environmental issue gave the facility new life.

Concerned about the amount of waste going into landfills, the state Office of Environmental Assistance began to pressure counties to come up with other solutions for trash disposal. Since the state classified burning as recycling, the mothballed powerplant offered an alternative to dumping. Several counties in Great River Energys service territory took out bonds, and the co-op converted Elk River Station to a waste-to-energy generator in 1989.

New treatment process

Elk River power station has been producing electricity from this replenishable fuel source ever since. There is always room for more innovation at Great River Energy, however.

Last fall, the station test burned 60 tons of clean fuel that had been heat-treated instead of shredded. In a process Hanson described as "the opposite of papermaking," raw garbage is heated to 260 to 270 degrees Fahrenheit, breaking the cellulose content down to fiber without burning it.

The treated fuel component looks a lot like peat moss, making it easier to screen out the shriveled plastic and the glass, metal and aluminum, all unchanged by the heat. "Plastic contains chlorine, which is very corrosive, and glass fouls the boilers," explained Hanson. "Eliminating those two elements could dramatically cut down our maintenance costs."

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2004/april/apr044.htm

SolarBee uses sunshine on the water to scrub reservoirs clean

Running water is an energy source, but still water can be an energy drain. As much as 3 percent of the country's energy consumption goes to treating water in reservoirs and wastewater lagoons, according to Pump Systems, Inc., manufacturers of a floating water circulator that runs on renewable energy.

The photovoltaic-powered SolarBee aerates closed water bodies, mixing warm, oxygen-rich water from the pond's surface with cooler, oxygen-depleted water at the bottom. Currents do this same job in open watercourses like rivers and springs, balancing the aquatic ecosystem. Without aeration, nuisance plants and harmful algae build up, killing fish in freshwater ponds, aggravating environmental concerns in wastewater lagoons and giving off unpleasant odors.

Until recently, municipalities and industries had only two options for aerating ponds and reservoirs: a never-ending cycle of chemical treatments or mechanical circulators powered by electric motors. That didn't strike PSI president and founder Joel Bleth as enough of a choice.

PSI developed, manufactured and installed its first solar-powered circulators in 1998. Operating from sunup to sundown 365 days per year, two SolarBees can replace a 100-horsepower circulator running for five hours a day at peak load. A shore power option allows the unit to run around the clock for about $10 in monthly electric charges.

SolarBee helps reclaim lake

Aeration is a practical—and affordable—answer to odor control for small communities. Residents around Gaynor Lake in Boulder County, Colo., used the 66-acre, freshwater pond for water skiing and swimming. However, when the weather warmed up, algae blooms and fish kill turned the water murky and smelly.

The Gaynor Lake Homeowners' Association consulted an engineer and a limnologist—an expert on freshwater conditions. The limnologist's research indicated that drawing oxygenated water across the oxygen-free (anoxic) water layer on the lake bottom would clear up the water and eventually replace the black, plant-free silt with clean sand. He suggested a $30,000 SolarBee circulator as an alternative to draining the lake.

Although the SB10000 was installed in June 2003, too late in the year to completely aerate the pond, residents noticed that the smell had diminished by September. "When the wind blew over the lake, it actually smelled like water," noted Swanson. "The long, gooey strings of algae on rock walls and piers were gone, too."

Reduced need for additives

What one SolarBee is doing for Gaynor Lake, several SolarBees are doing for a large reservoir in California. Lake Palmdale supplies the city of Palmdale, Calif., Water Treatment Plant and supports boating, fishing, hunting and airplane landings. Aqueduct water containing nutrients from farms and residential lawns feed the 312-acre lake, creating favorable conditions for intense blue green algae blooms.

In 2002, the city applied 2,000 pounds of copper sulfate weekly to the raw water reservoir to control taste and odor problems. Even with the treatment, the lake was designated a "no contact" body of water and the city was able to draw only 25 percent of its 30 million-gallon daily needs from the reservoir.

The Solarbee Model SB10000, shown here with its draft tube attached, circulates 10,000 gallons of pond water per minute to help control algae blooms. (Photo courtesy of SolarBee/Pump Systems, Inc.)

The city installed six of SolarBee's new SB10000 units on the reservoir in November 2002 and added a seventh in June 2003. The units were equipped with intake hoses that distributed oxygen to average depths of 20 feet. The improved aeration allowed the city to apply copper sulfate only once that year, saving $65,000 on the chemical compared with 2002. "The SolarBees cost a total of $210,000 and the maintenance and operation costs are very low, making the payback period a little over three years," said Bleth.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2004/april/apr046.htm

Innovative home produces as much energy as it uses

Zero, a number representing nothing, represented big energy savings when the National Renewable Energy Laboratory and its partners, Pardee Homes and ConSol, Inc., unveiled the Zero-Energy Home at the 2004 International Builders' Show in Las Vegas.

By combining renewable energy technologies with highly energy-efficient construction, the home produces about as much energy as it consumes annually to achieve "net zero" energy consumption. The Ultimate Family Home, as Pardee calls it, was the result of a DOE initiative to bring the latest research in energy efficiency and renewable energy to the building industry. "We want to make people aware that the technology for homes to produce their own energy exists now, that it's not something that is off in the future," said NREL Zero Energy Homes Program Manager Tim Merrigan.

Comfort, efficiency

Pardee built the 5,300-square-foot custom home at the Nevada Trails master-planned community. An 8-kW, rooftop photovoltaic array provides electricity, and a solar hot water system heats the home's water. Good insulation, air sealing and advanced windows work with a highly efficient air-conditioning system to keep the house comfortable, and energy-efficient appliances add to the savings. The home uses about 90 percent less energy than a similar home built strictly to code.

ZEH homes use three basic strategies to dramatically reduce the amount of energy a single-family home consumes.

- **Tight shells.** Extra insulation in the walls, floors and ceilings; strategic window placement and smart windows that limit solar heat gain; and reflective, radiant barrier roofing.
- **Energy efficient heating and cooling systems** including tankless water heaters and state-of-the-art heat pumps, and major appliances that exceed Energy Star-rated efficiency levels.
- **A cost- and pollution-free energy source.** Wind power, fuel cells and biomass generators are alternatives, but currently, all ZEH homes use state-of-the-art PV systems.

Pardee held focus groups to learn what families want and need in homes, and shared that information with Bassenian/Lagoni Architects, designer of the Ultimate Family Home. "The house had custom touches like a heated workshop and surround sound for men, a workspace nook in the kitchen, even a secret room in the girl's bedroom to hide from her little brother," Merrigan said.

Sunbelt embraces ZEH

Clarum Homes and Morrison Homes, two more homebuilders NREL partnered with for the ZEH initiative, are building developments in Watsonville, and Elk Grove, Calif., respectively. The Armory Park del Sol neighborhood in Tucson, Ariz., is being built by John Wesley Miller Companies in cooperation with NAHB Research Center.

Sacramento-area homebuilder Premier Homes is working with ConSol on a 95-house subdivision, and has received additional subsidies from the Sacramento Municipal Utility District. SMUD is providing the builder $200 per home for advanced energy-efficiency features and about $7,000 per home toward the cost of each 2-kilowatt solar tile rooftop system. The utility will also offer $20,000 to help market the homes.

SMUD's maximum total contribution is more than $700,000, about half of which is coming from the money remaining in the 2003 Public Good fund. The other half is part of the 2004 budget.

SMUD is also assisting NREL by collecting data on ZEH homes in its service area.

Competitive pricing

Most of the ZEH houses under construction are competitively priced with conventional homes. The energy-thrifty homes in the Premier Gardens subdivision are intended for entry-level homebuyers.

The PV system and energy efficiency features add $8,000 to $16,000 to the cost of a ZEH house, mostly in upfront training and retooling costs, said Rob Hammon, ConSol's chief consultant on ZEHs. Once those expenses have been covered, mass production helps stabilize the cost.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2004/april/apr047.htm

Faith in mustard seed fuels biodiesel cartel

Innovation can mean creating something completely new, or, in the case of Blue Sun Biodiesel, it can be taking a great idea—like extracting fuel oil from a renewable plant source—and tailoring it to the specific needs of a region or group—like struggling farmers in dry western states.

The Ft. Collins, Colo.-based agriculture energy company opened for business in 2001 to capitalize on the growing market for biodiesel. "We started with the idea of producing and distributing a high-quality, dependable product that both diesel engine manufacturers and consumers would fully endorse, and worked backward from there as we learned more about the business," recalled owner and CEO Jeff Probst.

Colorado Agriculture Commissioner Don Ament (second from left), Rural Development Director Gigi Dennis and Tom Wernsman (right), director of Blue Sun Producers, Inc., joined Glenn Babcock (left) and Howard Wickham (second from right), co-owners of Heartland Town and Country store, to cut the ribbon on the state's first all-biofuel filling station. (Photo courtesy of Blue Sun)

Cost-effective feedstock

An early lesson was that importing soybeans, a commonly used biodiesel feedstock, from the Midwest to Colorado added to the cost of manufacturing the renewable fuel. Blue Sun enlisted researchers from Colorado State University, Kansas State University and the University of Nebraska to investigate industrial oilseed crops that could grow in dry land crop areas. "We started looking at alternative feedstocks, not only from a cost perspective but also in terms of fuel performance, Probst noted."

Blue Sun turned its attention to a mustard family plant similar to a biodiesel feedstock used in Europe, which offered many performance advantages over soybeans. Pound for pound, the oil content of mustard seed is 40 percent, compared to the 18 percent content of soybeans. Mustard seed has a higher cetane rating, the measurement of fuel's ignition quality, and it retains flow properties in freezing temperatures better than soy-derived oil.

Best of all, both for Blue Sun and for Colorado farmers, mustard seed is better suited than soybeans and other oil-bearing crops to the growing conditions of the High Plains region. The drought-tolerant, heat-resistant crop requires little irrigation, a factor that improves the fuel's energy balance. Soybeans produce 3.2 units of energy for every unit of energy used to process the oil into fuel. Probst estimates that growing the low-moisture feedstock close to the manufacturer helps to boost mustard seed's energy balance to more than four units of energy per unit spent in processing.

Co-ops give farmers stake

Mustard seed's early spring planting season and July harvest fits into the fallow cycle of eastern Colorado's winter wheat producers, adding incremental value to the farmers' crops without adding to irrigation loads.

Blue Sun formed two growers' co-ops— Colorado-based Blue Sun Producers, to serve Colorado, eastern Kansas and Wyoming farmers, and Progressive Producers, exclusively for the state of Nebraska—to offer farmers a stake in their vision.

The money will be used to fund the construction of a 2.8-million-gallon biodiesel production facility in northeastern Colorado. More than 50 farmers have already joined the cooperatives, according to Probst.

DOE awarded Blue Sun a $100,000 Phase I SBIR grant to breed new oilseed varieties that may improve on the fuel properties of mustard seed.

The company received two separate USDA Rural Development matching grants for $450,000 each to help with setting up the growers' co-ops.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2004/april/apr048.htm

Expo introduces newest electric technologies

Western Energy Services Representative Ron Horstman and Watson the mold-detecting dog were among the experts covering the latest topics in electric technology for the building industry at the fourth annual Electro-Technology Expo, January 22.

More than 200 professional builders, developers, contractors, realtors, engineers and architects attended the all-electric educational event at the Ramkota Best Western Inn in Rapid City, S.D. Western customer West River Electric Association and investor-owned Black Hills Power co-sponsored the expo. "I went to a similar show Miannkota Power System did for contractors, and I knew this would be a great thing for builders in our area," said Marketing Representative Dave Holte. "Black Hills liked the idea too, so we teamed up and it's been getting bigger every year."

In addition to exhibits, the expo presents a program of four concurrent sessions on issues and technologies to improve energy efficiency in new and existing buildings. This year, topics ranged from commercial green building design and energy efficient electric products to utility line service policies and electric incentives for new construction. "We look for experienced speakers on hot topics, and at the end of the conference, we ask participants what they would like to see on the next schedule," said Holte.

Western and Black Hills were instrumental in putting the program together, Holte added. "I've used Western as a resource a lot. They have the technology, the education—everything we need."

This year, Horstman made three presentations: "Resources For The Energy Services Professional," "Operations, Maintenance and Recommissioning" and "Tools to Enhance Electric Technologies."

Western's Energy Services Web site featured prominently in "Resources for Energy Services Professionals" when Horstman showed the audience how to use the various Web site features to fit their individual needs and the needs of their customers.

Tony McFarland (left), owner of Mold Masters, and handler Rebecca Rasmussen demonstrate Watson's mold-detecting technique for a local reporter at West River Energy's fourth annual Electro-technology Expo. (Photo courtesy of West River Energy Services)

During the OM&R session, he promoted Western's Equipment Loan Program, demonstrating tools like the infrared cameras and the Dranetz 4300 power quality analyzer, and showing how to make reservations online.

"Tools to Enhance Electric Technologies" highlighted new emerging energy-efficient technologies. "I had researched 25 new technologies and just didn't have time to cover everything," Horstman explained. "When the allotted time for the session had expired, the class wanted to know more."

A wide range of professionals attended the sessions, Horstman said, giving him the chance to address familiar subjects from different perspectives.

The opportunity to learn about the latest technologies and receive education credits was a big draw, but the biggest star of the expo may have been Watson, the mold-detecting dog. The three-year-old terrier is the secret weapon of Mold Masters, Inc., an Anoka, Minn., mold detection and remediation firm.

Accurately pinpointing the source of mold can significantly lower remediation costs, and trained mold dogs, like Watson, are the most effective technology for the job.

A dog's nose is so sensitive that it can detect the slightest traces of harmful molds, growth so faint that sophisticated electronic sensors can't pick it up.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2004/april/apr049.htm

Western joins launch of N.D.'s largest wind farm

At the risk of sounding like a long-winded Oscar winner, Basin Electric Power Cooperative's Member Marketing Manager Ron Rebenitsch was being completely sincere when he ran down a list of Western employees who helped to make the 40-MW Edgeley wind farm a reality.

Western designed and installed the breaker addition that connected the turbines to the grid. But more than that, "Western's employees did a thorough and professional job of supporting this project from the beginning," Rebenitsch said. "Without their help, I doubt we could have got it off the ground."

Short notice project

Basin sought Western's assistance while still in negotiations with FPL Energy to build and operate the North Dakota Wind Energy Center. That the wind farm came online only 13 months after Basin signed the contract was a tribute to the cooperative efforts of Basin, Western and Basin member Central Power Electric Cooperative.

The Upper Great Plains staff earned Basin's thanks for meeting a tight construction schedule, helping to secure environmental permits and resolving complex interconnection issues. "The short notice was the biggest challenge," acknowledged North Dakota Maintenance Manager Brian Morris, adding his praise to the crews that kept the job moving. "Without Electrician Foreman Jim Koehn, Field Engineer Tim Gerhart and the Bismarck and Jamestown crews, the project would have gotten behind. CSO Engineering did an outstanding job of design in a short time frame."

Western's main contribution to the project was modifying and expanding its Edgeley Substation to handle the new line bay from the wind farm. The modifications included building a main and transfer bus for reliability, replacing and installing three new breakers and several switches, adding new control boards and relays and modifying the remote terminal unit. Also, Western bought additional property for the substation expansion and modified the approach structures into the substation.

Forman Lineman Bob Miller (crane operator) maneuver breakers into place at Edgeley Substation. (Photo by Brian Morris)

Central Power built a 10-mile transmission line from the Edgeley Substation to the breaker addition to the wind farm through FPL Energy's Pomona wind collector substation. Western also assisted with building remote terminal units and new relays at Pomona.

Partnerships key

The Edgeley wind farm began generating clean energy in September 2003, with an official ribbon-cutting ceremony attended by North Dakota Governor John Hoeven in October.

Basin is buying 100 percent of the wind farm's output from FPL Energy and integrating it into its portfolio to sell as green tags, rather than as a green power option. The utility's portfolio includes generation from its 2.6-MW Prairie Winds project near Minot, another development near Hyde City, S.D., and small turbines owned by the Rosebud Sioux tribe and the Pipestone School District. Western is working with Basin and other consumer-owned utilities to develop a certification standard and marketing network for green tags generated by such projects.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2004/april/apr0410.htm

TOPICS from the POWER LINE

Insulation key to wine cellar temperature consistency

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

Question: We live in Sacramento, Calif., and would like to design an energy-efficient, residential-scale wine cellar that will maintain the required 55-degree F temperature. Should we build it above or below ground? Also, it was suggested that we use R-50 insulated concrete forms. Is this feasible?

Answer: Research data from the US Geological Survey, the Army Corps of Engineers and the National Water Well Association show that the average ground temperature below two feet in the Sacramento area ranges from 60 degrees F to 64 degrees F.

Assuming this data, here are suggestions for keeping the wine cellar at 55 degrees F.

Construct the wine cellar completely underground with no outside windows. If the room is going to be occupied or used as a tasting room, local building codes may require a window. If so, specify a Class 20 window (U-0.20; vinyl or fiberglass framing, triple glazing, and low e glass).

Insulate the cellar room walls adjacent to the rest of the building at the level of insulation you would normally install in a residential building, following the state energy code. Walls should be insulated to R-19 or R-21, and the ceiling at R-30. An R-10 insulated door of either fiberglass or steel should be used. Make sure that the door seals well when closed.

Concrete walls do not need to be insulated providing they are underground. At the two-foot level and above, you will need to insulate the outside of the concrete. It is suggested you insulate down to the two-foot level with R-10 extruded polystyrene. It's not recommended to use insulated concrete forms that have an R-50 rating. The tested values are closer to R-20. The California Energy Commission rates the ICF system at an R-value of about 20.

The concrete floor should not be insulated. This, along with not insulating the concrete walls below

See POWER LINE, page 12

New Western award recognizes regional energy savers

Darrel Iverson, an electrician for the University of North Dakota Facilities Department's electrical team, was approved by Western's Upper Great Plains regional office to receive the first-ever Competitive Edge Award.

Western developed the award to commend individuals, groups or organizations within its regional territories for specific energy efficiency and renewable energy efforts.

"We wanted to draw attention to the energy-saving strategies and ideas of our broad customer base," said UGP Energy Services Manger John Pankratz. "There are innovative programs and people in our region that go the extra mile to support Western's mission and programs. The Competitive Edge Award recognizes those programs and people."

Sub-zero, weather did not discourage UND Electrician Darrel Iverson from claiming his Competitive Edge Award from Western's Upper Great Plains Regional office.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2004/april/apr0411.htm

Calendar of events

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

April 5-9	Energy OutWest Conference: Thinking Inside the Box, U.S. Department of Energy, Seattle office, states of Alaska, Idaho, Oregon, Washington, California, Arizona, and Nevada; Sacramento, CA. Contact: Washington State University Conferences and Professional Programs; phone: 509-335-3530.
April 13-14	Colorado Wind & Distributed Energy: Renewables for Rural Prosperity; Colorado Governor's Office of Energy Management and Conservation, U.S. Department of Energy's Wind Powering America; Denver, CO. Contact: Megan Castle or Ed Lewis, OEMC; phone: 303-894-2383 x 1211.
April 14-16	North American Energy Summit; Western Governors' Association; Albuquerque, NM. Contact: WGA; online registration; fax: 303-534-7309.
April 17-18	SOLFEST Southwest; Solar Living Institute, Kyocera; Scottsdale, AZ. Contact: Andrea Tintle; phone: 480-488-8792.
April 18-21	ICEED's 31st Annual International Energy and 25th Annual International Area Conference; International Research Center for Energy & Economic Development; Boulder, CO. Contact: Dorothea H. El Mallakh; phone: 303-442-4014; fax: 303-442-5042.
April 20-23	Industrial Energy Technology Conference Sempra Energy Solutions, Texas State Energy Conservation Office, USDOE and many more; Houston, TX. Contact: Lana; phone: 979-847-8950.
April 26-30	Empowerment With Power Tools! Women's Carpentry; Solar Energy International; Carbondale, CO. Contact: SEI; phone: 970-963-8855; fax: 970-963-8866.
April 27-30	15th Annual U.S. Hydrogen Conference and Hydrogen Expo USA; National Hydrogen Association; Los Angeles, CA. Contact: Toyya Patterson; phone: 202-223-5547; fax: 202-223-5537.
April 26 to May 1	Affordable Comfort Conference; U. S. DOE, many more; Minneapolis, MN. Contact: Affordable Comfort; phone: 724-627-5200; fax: 724-627-5226.
May 3-14	Women's Photovoltaic Design & Installation; Solar Energy International; Paonia, CO. Contact: SEI; phone: 970-963-8855; fax: 970-963-8866.
May 5-7	24th Annual Utility Energy Forum, Energy Efficiency & Renewables: The First Response Strategy; Western, Bonneville Power Administration & more; Tahoe City, CA. Contact Guy or Linda Nelson; phone: 541-994-4670.
May 16-18	RMEL Spring Electric Energy Conference, Rocky Mountain Electrical League; Ft. Collins, CO. Contact: RMEL; phone: 303-695-0089; fax: 303-695-0704.
May 18-20	12th National Conference on Building Commissioning; Portland Energy Conservation, Inc.; Atlanta, GA. Contact: Kristin Peterson; phone: 503-595-4466.
June 9-10	Fuel Cell 2004; Fuel Cell Magazine; Denver, CO. Contact: Marsha Hanrahan.
June 12-17	Women's PV Workshop; Midwest Renewable Energy Association, Solar Energy International; Custer, WI. Contact MREA; phone: 715-592-6595.
June 16-17	West Coast Energy Management Conference; Association of Energy Engineers; Anaheim, CA. Contact: Patty Ardavin; phone: 770-279-4390.
June 19-23	APPA 2004 National Conference; American Public Power Association; Seattle, WA. Contact: Paulette Kum; phone: 202-467-2941.
June 24	Generation Conference; Rocky Mountain Electrical League; Northglenn, CO. Contact: RMEL; phone: 303-695-0089; fax: 303-695-0704.
June 25-27	CRES 2004 Colorado Renewable Energy Conference; Colorado Renewable Energy Society; Denver, CO. Contact: CRES.

Power line *from page 11*

two feet, will help stabilize the room temperature at the adjoining ground temperature of about 60 to 64 degrees F. Check with the local building official to see if that area has any pockets of radon. If so, there will be special requirements for insulating and ventilating the wine cellar room.

As the below grade room will have a stabilized temperature above the required 55 degrees F, cooling will be necessary. You may need to select a dedicated air conditioning system for the wine cellar room to cool it year around.