

Recycling promotion highlights local resources

Some Coloradans may regard the Four Corners area in the southwestern-most tip of the state as the “ends of the Earth,” but Cortez-based Empire Electric Association, Inc. found everything it needed locally to set up a successful refrigerator recycling program this spring.

“No need to call in ‘experts’ from Boulder,” Member Services Manager Doug Sparks pointed out proudly.

The inspiration for the program originally came from Holy Cross Energy. “We wanted to put the spotlight on a silent energy user,” said Member Services Manager Doug Sparks. “Refrigerators are the third largest energy consumer in the home.”

One of the problems, he explained, is that people continue to use their old refrigerators for extra food storage even after buying a new, more efficient unit. Empire Electric’s recycling campaign slogan advised members, “Don’t plug it in – turn it in.”

The co-op has a meter that measures refrigerators’ energy use, and members can request an audit of their appliances. “It helps them understand how the refrigerator plays into their overall electricity use,” said Sparks. “There are some bad energy hogs out there.”

Landfills provide service

The recycling promotion also called attention to two local landfills that process old refrigerators. “I didn’t know about their services until I started planning the promotion,” said Sparks.

He contacted Landfill Manager Deborah Barton at the Montezuma County Landfill in Colorado to ask if she knew of a company that recycled appliances. “I said, ‘We do,’” recalled



Another old refrigerator enters the recycling loop at Montezuma County landfill. Empire Electric Association partnered with the landfill to promote proper disposal of old appliances. (Photo by Empire Electric Association)

the landfill manager. “Dumping refrigerators is illegal because Freon is a pollutant, so we’ve always taken the units for a fee. In 1999, we formalized our recycling process. Since 2002, we have removed Freon from 338 appliances.”

For Empire Electric members across the border in Utah, San Juan County Landfill provides the same service.

For a small disposal fee, the landfills remove the Freon from old refrigerators and freezers and dispose of it according to EPA regulations. Once the refrigerators are evacuated, a local contractor crushes and bales the shells and takes them to a

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regional steel mill to complete the recycling loop.

“Modern landfills have to meet a lot of standards and requirements. These aren’t dumps in the old-fashioned sense. They are the unsung heroes of environmentalism,” said Sparks.

Enthusiastic response

“Unfortunately, having a local service doesn’t prevent illegal dumping of old refrigerators,” said Sparks. “So we decided to give our members a little more incentive.”

Empire Electric offered to waive the landfill fee for members recycling refrigerators and freezers during Earth Week, April 17-22. “Both landfills asked us not to offer the rebate all year around because they were afraid they would be inundated with old refrigerators,” said Sparks.

Marketing took the form of a couple of radio interviews, an

ad in the local newspapers, an announcement in the co-op’s member newsletter and word of mouth.

There was a very heavy but positive response. Barton said, “We’ve had people who just heard about the program and showed up with their old appliances without a certificate or after the promotion dates. Some of them were willing to pay the disposal fee directly to get the ‘dang things out of the garage.’”

To participate in the promotion, members had to pick up a landfill certificate stamped with their account number at one of Empire Electric’s business offices. The co-op has offices in Cortez, Dove Creek and Egnar, Colo., and Monticello, Utah. “We offer online services, but a lot of our members still like to do business face to face,” observed Sparks.

Each household could dispose of one refrigerator and one freezer, and receive a \$50 rebate for each unit in addition to the waived fee. Members presented the certificates at the landfill when they dropped off their old appliances and signed a manifest. After processing the units, the landfill returned the top of the certificate to Empire Electric along with the manifests for all the recycled refrigerators and freezers. The utility then sent members their rebates and paid the handling fees to the landfills.

Wages of success

Representatives from Empire Electric were at both landfills on Earth Day to help process more than 230 refrigerators and freezers. “People really appreciated the safety aspect, too – disposing of

refrigerators in a responsible way so kids can’t get trapped in abandoned units,” Sparks said.

The program’s success is also helping Empire Electric build its reputation for environmental leadership. Barton invited Sparks to talk about the promotion at a solid waste management conference in Alamosa, Colo., this fall. “This partnership has been really good for encouraging energy efficiency, environmental responsibility and recycling,” she said.

Partnership is one of the things Sparks enjoys about the co-op atmosphere. The former staking engineer moved to the member services management position at Empire Electric in 2003, and he has been discovering all kinds of resources to build its members services program. “All you have to do is put out the word and the resources pop up,” he said. “The beauty of the recycling program was that the working parts were already in place. All we had to do was promote it and underwrite it.”

The board of directors and community have been very supportive, he added, and more programs are in the works. Colorado boasts many utilities and municipalities with innovative energy programs and policies. Taking the “do-it-yourself” approach to energy efficiency and renewable energy, Empire Electric is ready to join those ranks. ⚡

Energy Services Bulletin

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Editor: Kevon Storie

Designer: Grant Kuhn

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MHA Nation tackles wind development one step at a time

If the dot.com boom of the '90s taught investors and entrepreneurs anything, it was “make haste slowly,” which is how the Mandan, Hidatsa and Arikara Nation is approaching wind development.

In February, the Three Affiliated Tribes commissioned their first 66-kW wind turbine on the Fort Berthold Indian Reservation in North Dakota. Not only does the unit provide the Four Bears Casino with part of its electricity, it prepared the tribe for bigger ventures, said MHA Nation wind energy director Terry Fredericks. “This project helped us to develop relationships with the industry, learn about wind development issues and get the word out about the tribes’ class 5 and 6 resources,” he said. “The tribal council and Chairman Tex Hall deserve congratulations for getting the turbine up and running,” Fredericks added.

Project evolves

The learning process began in 1999 when the MHA Nation received a matching grant from DOE’s Tribal Energy Program to explore utility-scale wind development. The tribe began collecting wind data in 2000 and selected the site in the hills above the Four Bears village. Fredericks joined the project in 2003, when the tribe’s environmental director who helped launch development left for another job.

The original plan called for installing a used, reconditioned 100-kW turbine. “We decided early on to go with a new 66-kW turbine because the reconditioned units sometimes

have problems,” Fredericks noted. “That allowed us to focus on other challenges.”

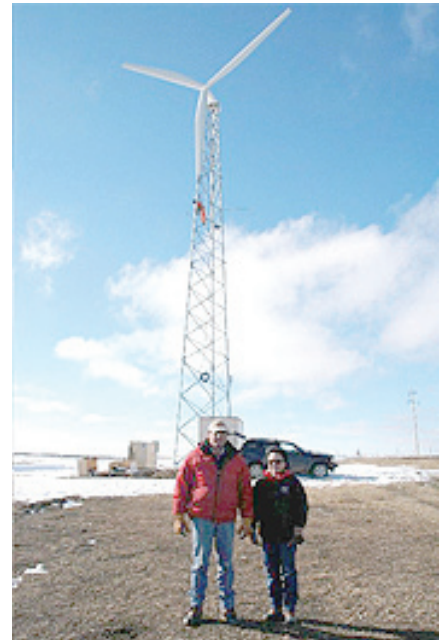
The MHA Nation found a valuable resource for meeting those challenges in energy consultant Distributed Generation of Golden, Colo. “The company helped in securing the interconnection agreement and power purchasing contract with McKenzie Electric Power Cooperative,” said Fredericks.

McKenzie Electric, one of the tribes’ four power providers, runs the turbine’s output through its transformer and buys the wholesale power at 2.5 cents per kilowatt. The tribe buys the electricity back at retail prices of 6.5 cents per kilowatt. NativeEnergy also buys green tags from the project. “Economics is always the hard part. That’s where the development process usually slows down,” Fredericks admitted. “We hope to see the equation improve.”

Next step

The tribe is optimistic enough about wind energy’s future to participate in an 80-MW project being undertaken by the Intertribal Council on Utility Policy. The ICOUP plan calls for eight 10-MW wind farms to be built on the lands of 10 Upper Great Plains tribes.

A feasibility study to determine the best site on the Fort Berthold Reservation for a 30-MW or larger development, said Fredericks, who serves as ICOUP vice president. “We’ve also begun economic modeling to figure out the optimum size for the facility,” he added. “You



Terry and Nadine Fredericks assisted with the daily documentation of the Fort Berthold wind turbine construction. (Photo by Robert Gough)

have to know the total local load to size it for distribution, work out the transmission issues for approved export of excess energy and work out the power purchase and interconnection agreements with electrical service providers. Then you can put a cost on construction, including the possibility of an EIS for the site development.”

Funding, as always, is a concern for the ICOUP project. Fredericks said the group will look at every option, including Clean Renewable Energy Bonds. He hopes to see major construction begin within the next two years.

Training and jobs

Building a local workforce

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**Want to know more?
Visit www.wapa.gov/es/pubs/esb/2006/june/jun062.htm**

ACORE committee provides renewable energy forum for utilities

Transmission lines are not the only interconnections needed to deliver renewable energy to consumers. The lines of communication—between utilities, and between power providers and the renewable energy industry—must be opened, too, which is why the American Council on Renewable Energy formed a utility committee this year.

“We felt that utilities needed to be able educate themselves about the technical and economic issues of renewable energy independent of advocates,” said Tom Key of the Electric Power Research Institute.

Key co-chairs the committee with Jeff Anthony of We Energies and Herjinder Hawkins, manager of Salt River Project’s renewable energy and technology initiatives. “The committee is there to help support individuals who are designated as the renewable energy managers in their respective organizations,” said Anthony.

The utility committee’s “steering committee” includes members from Arizona Public Service, Austin Energy, Chelan County Public Utility District, EPRI, Hawaiian Electric Company, Inc., Sacramento Municipal Utility District, Salt River Project, Southern Company and We Energies.

Other founding members include Alliant Energy, Ameren, Cinergy, Colorado Springs Utilities, Duke Energy, Pacific Gas & Electric, New Hampshire Electric Co-op, Puerto Rico Electric Power Authority, San Diego Gas & Electric and Southern California Edison.

Membership in the committee is open to all U.S. investor-owned

utilities, municipal utilities, cooperatives and federally-managed utilities. “The committee’s priority is to be a resource for utilities, and we need experts to do that,” said Key.

The group does not admit vendors, consultants, lawyers or regulators yet. At this time, only load-serving entities may join.

Education and networking

The utility committee focuses on three key activities to help utilities implement renewables policies: information exchange, networking opportunities and education on renewable energy concepts and issues facing utilities.

During three conference calls this spring, the steering committee identified potential topics of interest to member utilities. The initial list included regulatory-based renewable portfolio standards, green pricing programs, best practices and success stories from utilities that have adopted renewable energy sources, analysis of renewable energy programs and projects at member organizations and data exchange between utilities and outside industries.

Those issues were among a dozen different ideas discussed at the first annual meeting of the utility committee held April 10, which coincided with the POWER-GEN Renewable Energy & Fuels Conference in Las Vegas. ACORE co-hosts the event with PennWell Corporation in an effort to



Geothermal power is one of the resources available to utilities adding renewable energy to their portfolios. Another resource is ACORE’s new utility committee which will help power providers address renewable energy issues and exchange information. (Photo by Calpine)

move renewables into the mainstream energy sector. “Co-locating our annual meeting with the conference provided the kind of networking and educational opportunities the utility committee envisions,” said Key. “For every technical question members might think of during the meeting, there were experts to answer it in the exhibit hall.”

More than 30 utility representatives from California to Texas, Wisconsin, Georgia, Puerto Rico and New England attended the meeting. Participants included 11 co-ops, municipal utilities and other public load-serving entities.

Familiar issues

Members voted on the committee’s priorities for the coming year. The five top issues will look familiar to any utility trying to incorporate renewables into its portfolio:

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ACORE committee

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- **Procurement** – best practices for renewable resource acquisition and lessons learned.
- **Forward pricing** – better numbers for planning purposes and regional analyses.
- **Utility ownership of renewable energy plants: pros and cons** – the core competencies needed for this approach and the tradeoffs involved.
- **Power/system integration** – the cost of intermittent resources, especially wind. This will be the topic of another Web conference.
- **RPS: Best practices and lessons learned** – a regionally focused look at percent requirements, renewable energy definitions and more. The issues will be subjects of

webcasts or teleconferences, Key said, and if there is enough interest, the utility committee will establish standing working groups. A working group for procurement will probably be the first topic since, “Utilities are ‘leasing’ more renewable energy than buying,” noted Key. “They want to know how to do a purchase and what type of agreement involves the least amount of risk.”

Forward pricing will also require a working group, said Key, and additional research. The working group will seek research partners such as the Department of Energy and EPRI, as well as renewable energy manufacturers.

ACORE expects to present the first webcast on utility ownership of renewable powerplants. There will probably be additional breakout sessions since ownership issues for investor-owned utilities are different from those of public power entities. RPS will be the topic of the committee’s second webcast,

and a working group may form. An upcoming webcast on system integration is also a high priority.

Chance to shape future

ACORE encourages load-serving entities to join ACORE and become involved in the utility committee. “Utilities have the opportunity to take an active role in shaping the future of renewable energy and to develop working relationships with national leaders in business and government,” said Key.

He added that power providers are on the front line when it comes to communicating the costs and benefits of renewable energy to the public. The utility committee can help the industry prepare for leadership.

Membership applications for the utility committee can be downloaded from the ACORE Web site. To get involved in the committee, contact the co-chairs or Tom Weirich, ACORE’s membership director, at 202-393-0001, ext. 7582. ⚡

MHA Nation

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with wind expertise is another challenge to developing the resource on reservations – one that the MHA Nation and other tribes welcome. Fredericks has attended renewable energy training workshops for Native American tribes offered by the National Renewable Energy Laboratory, Bureau of Land Management, DOE and Federal Energy Regulatory Commission. “The reservations have partnered with state and Federal agencies

to sponsor a variety of renewable energy education,” Fredericks said.

Fort Berthold Community College, the MHA tribal college, offers an associate of applied science degree in energy technology and a certificate for energy technology. Around 30 students enroll in those programs each semester.

Professional contacts made during the tribe’s first project have translated into workforce development opportunities. Kandi Mossett, a tribal member working on a master’s degree in

environmental science, secured an internship with Distributed Generation. Fredericks is pleased, he said, because, “Somebody has to carry on as we grow.”

The MHA Nation does not expect that growth to happen overnight, but the 66-kW turbine powering the Four Bears Casino shows what can be done with a little patience and tenacity. Hall commented, “We wanted to demonstrate as a nation we could get electricity from the wind. Now we can move on to the next phase.” ⚡

Schools, forests, taxpayers all win with Fuels for Schools

Removing diseased and small diameter trees, underbrush and residue from forests prevents wildfires, promotes forest health and frees up money for schools to spend on education.

No, this isn't the Sesame Street game of "one of these things doesn't belong,"—it is Fuels for Schools, an innovative program sponsored by the U.S. Forest Service and state foresters in Idaho, Montana, Nevada, North Dakota and Utah. The program converts the mostly unmarketable byproducts of forest thinning and logging into lower-cost heat for schools and other public institutions. It also improves air quality, protects the urban-forest interface and creates economic value for a waste product.

Montana biomass burners

"Fuels for Schools offers a great opportunity to jump-start the development of a dispersed energy market in Montana using what is typically a wasted byproduct of forest management," explained Angela Farr, who coordinates the program for the state's Department of Natural Resources and Conservation.

The Darby School District in western Montana served as the pilot project for Fuels for Schools, replacing its fuel oil burner with a biomass burner in 2003. The system saves the school about \$100,000 annually in heating costs. Three more schools have followed Darby, installing wood chip systems and cutting their operating costs by tens of thousands of dollars. Thompson Falls School, the most recently completed project, saved well over

the projected \$30,000 after paying the construction loan—enough to hire a new teacher.

Another five projects are in the construction phase, including the University of Montana—Western Campus. The campus is replacing its natural gas system with a biomass burner that will burn 3,600 tons of wood chips annually to heat 470,000 sq. ft.

The DNRC, which coordinates the program in Montana, recently awarded three more grants. One of those systems will be installed in a newly constructed school, one will replace a fuel and propane burner and another will replace a natural gas system. "The rising cost of natural gas and other fossil fuels has improved the economics for biomass burners," Farr noted, "especially because the cost of wood chips is generally much more stable."

Once all 12 projects are completed, they will dispose of 12,800 tons of forest waste annually and save the schools a total of more than \$750,000 in operating costs.

Federal, community support

Montana's enthusiasm for the program is not surprising, since it originated in the Bitterroot Valley on the Montana-Idaho border in the



Nan Christianson, state and private forester in the U.S. Forest Service Northern Region, watches the metering bin feed the new biomass boiler at the Darby, Mont., schools. (Photo by Montana Division of Natural Resource Conservation)

wake of the disastrous 2000 wildfire season. "People were suddenly interested in hazard reduction logging at the wildland-urban interface," said Dave Atkins, Forest Service regional Fuels for Schools manager.

That led to discussions about how to dispose of the material mitigation would produce. "At one public meeting, a resident suggested that a biomass heating system he had seen in Vermont might be a good way to get rid of the slash," Atkins recalled. "Using biomass heat to help schools was just a short step from there."

The Forest Service launched Fuels for Schools in its five-state Northern and Intermountain regions in 2002. State foresters in each state conducted feasibility studies to find candidates for the program, and continue to administer Fuels for Schools locally.

The National Fire Plan initially provided specific grant dollars under

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Fuels for Schools

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the Forest Service's Economic Action Programs for pilot projects. Montana still receives earmarked funds for its program, thanks largely to the support of Senator Conrad Burns, said Farr.

Utilities have been supportive of Fuels for Schools as well, Farr added. DNRC gave a presentation to Montana Electric Cooperative Association on the program last year. MECA member Lincoln Electric Cooperative is helping Eureka Public Schools apply for a Rural Economic Development loan to help fund installation of a fully automated chip system.

When a school is selected for a project, DNRC works with local Resource Conservation and Development Areas to provide technical assistance to help facility managers and administrators develop fuel supply contracts. The division also recently contracted with CTA Group, an architectural and engineering firm, to study boiler systems in the state and determine the market potential for biomass heat in Montana.

Systems, facilities match

Factors that make for a successful conversion include the size of the school, its existing heating system, the cost of fuel and whether or not the project can piggyback on other renovations. "Installing the biomass burner during construction is the ideal," said Farr. "Also, the bigger the facility and the longer the operating

hours, the more cost-effective the system is."

That doesn't rule out smaller schools, however. "The limitations push us to come up with different solutions," said Atkins. "At Thompson Falls we installed a simpler, less expensive surge bin system."

The program uses three different types of systems: the semi-automated surge bin, fully automated large conveyance and pellet boiler. The surge bin system has a smaller storage bin and shorter conveyance system, and requires some manpower to load the fuel. The Thompson Falls bin holds about five to six tons of fuel.

Darby's system has a large conveyance system, which holds about two chip van loads or 50 to 60 tons of fuel. It cost more than \$650,000, compared to the \$455,000 price tag for the Thompson Falls project. Although DNRC installed large conveyance systems in the first three schools, Farr said that the smaller surge bins are usually more cost effective. Large, fully automated systems are appropriate for projects like the university campus.

DNRC is currently working on a demonstration of pellet-burning units. This type of boiler burns a processed fuel that is more expensive than green chip fuel, but still much less than fuel oil. The system is generally most cost-effective where space for fuel storage and conveyance is limited, and the facility is located near a pellet manufacturer.

Program future bright

A fourth type of biomass burner is the combined heat and power system, which generates power from burning wood chips, with heat as the byproduct. "People are very interested in CHP, but smaller systems simply don't have the pressure needed to drive a steam turbine," said Atkins.

That may change as Fuels for Schools moves beyond the schoolhouse. Central Montana Medical Center in Lewistown received a DNRC grant, and Atkins has a prison in Carson City, Nev., installing a one-MW heat and power system. "Large facilities with 24/7 operations may need high-pressure systems that could work for CHP," said Atkins. "Some universities and sawmills are generating power with biomass burners. But so far, for our purposes, heat is still the most valuable product."

Any product that can make forests and communities safer, save tax dollars, create jobs and reduce energy dependence is valuable indeed. Vermont already has a state biomass heating program. Atkins has talked with people in Oregon, California, Michigan, Colorado, South Dakota, Washington and Alaska where there is interest in organizing similar efforts.

Fuels for Schools and Beyond has turned two seemingly unrelated problems—disposing of waste from forest management and controlling operating costs in public institutions—into an answer that belongs to everyone. ⚡

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Utilities join projects to promote energy-efficient homes

Like any system designed to perform certain functions, houses have operating costs, yet homebuyers rarely factor those into their purchasing decisions. A group of builders, equipment vendors and utilities in the upper Midwest are working together and independently to change that.

“What people don’t realize is that there are two mortgages associated with a house,” said Don Mordal, president of Preferred Energy Solutions. “The first, of course, is the house payment and the second is the operating cost—the bill for heating and cooling, lighting and appliances.”

Mordal’s company promotes SmartRooms radiant heating systems manufactured by Therma-Ray. The systems are being installed in some energy-efficient homes in North Dakota and Minnesota.

Other efficiency strategies upper Midwest builders are using include structural insulated panels, poured-in-place basement walls, electric air-to-air and geothermal heat pumps, off-peak electric water heaters, efficient lighting and Energy Star appliances. Combining a highly insulated building shell with energy-efficient equipment can reduce home operating costs by 40 to 75 percent. “Ultimately, it makes a home more affordable,” said Mordal.

Utility-builder partnerships

The secret, said Marketing Manager Marshal Albright of Cass County Electric Cooperative, is to plan for energy savings even before construction begins. “A utility

that wants to help its residential customers save energy has to develop a relationship with local builders,” he said. “The Touchstone Energy Home program is giving us the opportunity to do that.”

A Touchstone Energy Cooperative in Florida originally created the program to help its member co-ops promote energy-efficiency and comfort standards for new, existing and manufactured homes. Cass County Electric modified the program for the local climate and is partnering with a local builder, Eidsness Construction, to build the first Touchstone Energy Home in Fargo, N.D. The plan is for the house to go a step beyond the Touchstone program to meet Energy Star standards.

Features will include either a high-efficiency air source heat pump or electric radiant heating system with a high efficiency gas furnace to take advantage of Cass County’s off-peak program, and an electric water heater that exceeds 100 gallons and an energy factor rating of .91 or greater. The building envelope will have R-21 wall insulation, R-19 basement wall insulation and R-49 ceiling or attic insulation, along with double-pane windows and insulated doors. All appliances will meet Energy Star and lighting will be compact fluorescents.

“These measures will save homeowners about 40 percent on their energy bills while providing a more comfortable environment,” said Albright. “And it helps improve our electricity sales. This is good business no matter how you look at it.”

The Touchstone Energy home will



The Suburban Northwest Builders Association’s Energy House III, in Elk River, Minn., proves that efficient homes can be just as attractive and affordable as conventional homes. (Photo by Suburban Northwest Builders Association)

be completed in October—in time for Fargo’s 2006 HBA Fall Parade of Homes. Beginning October 1, all local builders will be able to participate in the Touchstone program. It will be the builder’s option whether or not the home will also be Energy Star certified.

‘Expensive efficiency’ myth

Energy Homes, Inc., comprising two of the Fargo area’s three Energy Star-qualified builders, will seek Touchstone certification. “The company has so much confidence in its energy-efficient homes that it may offer to pay the homeowner’s electric heating bills for the first five years,” said Energy Homes Partner Jerry Fontaine.

The structures incorporate Amvic insulated concrete forms, triple-pane Schuco windows and SmartRooms Earth Storage and radiant ceiling systems. According to Mordal, an electric radiant heating system using off-peak rates is an excellent and cost-effective option, especially for new construction.

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Visit www.wapa.gov/es/pubs/esb/2006/june/jun065.htm**

SOLAR 2006 focuses on renewable energy for climate recovery

The old saying, “Everybody talks about the weather, but no one does anything about it,” will be upended July 7 through 13, when energy professionals, environmental experts and policy makers come together at SOLAR 2006 – the National Solar Conference, hosted by the American Solar Energy Society and the Colorado Renewable Energy Society.

This year’s conference theme, “Renewable Energy: Key to Climate Recovery,” will focus on climate change and highlight the role of renewable resources and energy efficiency in reducing U.S. carbon emissions. “The power industry has the opportunity to take the lead in reducing greenhouse gases,” said Communications Consultant Phil von Hake, who is promoting SOLAR 2006. “The conference schedule showcases the options and resources available to utilities wondering where to begin.”

Location sets example

ASES is holding the annual event in Denver, a location that is significant for a number of reasons.

Mayor John Hickenlooper recently announced plans to build a large, urban solar plant to provide power for the city jail. Denver is among several Colorado municipalities to have a climate change policy, including Aspen, Boulder, Fort Collins and Steamboat Springs. Delta Montrose Electric Association and Holy Cross Energy are just two examples of co-ops with innovative renewable energy and energy efficiency programs.

Colorado is home to premier research institutions studying renewable energy and climate change, including the NREL National Center for Photovoltaics, the National Oceanic and Atmospheric Administration and the National Center for Atmospheric Research.

The conference also coincides with a kick-off to implement Colorado’s Amendment 37, the nation’s first citizen-initiated renewable portfolio standard. “More states are adopting RPSs and some are increasing their original standards,” said Renewable Energy Program Manager Randy Manion. “Utilities will be looking for ways to meet those requirements. The more they know about renewable power and the issues surrounding the different resources, the better their decisions will be—for the industry and the consumer.”

Utility concerns

Several workshops and technical sessions on the conference agenda directly address issues concerning power providers.

“Introduction to Distributed Power Systems,” July 8, will compare solar and renewable power systems with fuel-based distributed power systems. Participants will learn about different system designs, principles of operation and applications, compare combined heat and power systems, and examine renewable hydrogen as a replacement for fossil fuels.

“PV Technology, Performance, Market Costs to 2020,” July 9, is a comprehensive course covering cell technology, performance and



Denver **Solar2006**

ASES’s annual convention will take place at the Adams Mark Hotel in Denver, July 7 through 13. (Artwork by American Solar Energy Society)

manufacturing costs of photovoltaics. Case studies emphasizing the integration of PV elements as part of the building skin will be presented. The program concludes with a forecast of the industry to 2010.

Technical sessions of interest to utilities include “PV Utility Interactions,” on the challenges of very large-scale deployment of grid-connected PV, and “Economics and Finance,” an economic assessment of alternative energy.

Mayor Hickenlooper; Dr. Dan Arvizu, NREL director; Amory B. Lovins, chief executive officer of Rocky Mountain Institute; and former U.S. Senator Timothy Wirth will speak at the opening plenary session. Other plenary speakers will include Dr. James Hansen of NASA, Dr. Warren Washington of NCAR, former CIA Director James Woolsey, prominent researchers and academics, and notable professionals from the solar, electric, engineering and financial fields. Following the

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conference, proceedings from the various climate change sessions will be published in a special report.

Exhibits, tours

The SOLAR 2006 Exhibit Hall offers the opportunity to exchange information, launch products and close deals. More than 100 manufacturers, installers, dealers and consultants will be on hand to answer practical questions about purchasing and installing renewable energy systems. Attendees will

also be able to meet and talk to representatives from groups such as the Midwest Renewable Energy Association and North Carolina Solar Center.

ASES has scheduled tours of NREL and NCAR facilities, along with a trip to Rocky Mountain National Park and a whitewater rafting tour on the Arkansas River. The events will allow conference attendees to sample some of Colorado's famous natural beauty, and "remind them of what we need to protect," added von Hake.

The chance to combine a little

recreation with top-level professional development is the kind of efficiency that should interest busy professionals, observed Manion. "It's the one place where utility representatives can learn about solar programs and technologies and make very useful solar contacts in only a few days. SOLAR 2006 is a once-in-a-year opportunity."

For information about sponsorship or exhibiting, contact Becky Campbell-Howe, operations director for the American Solar Energy Society, at 303-443-3130 ext. 103. ⚡

Energy-efficient homes *from page 8*

These measures add about 5 to 8 percent to the home's price, said Fontaine, "while reducing heating costs up to 75 percent, and almost eliminating your cooling bill. An Energy Home is also up to eight times quieter than a conventional stick framed home," the builder said.

These features not only exceed Energy Star qualifications, but will more than double wall and foundation R-value to R-40 to 50, and triple window R-value with R-9 windows.

"The goal is to get buyers to think about houses in terms of performance—a building's miles per gallon, so to speak—and not just about the price," added Mordal.

Another demonstration of efficient home building, the Energy House III in Elk River, Minn., will receive an \$800 geothermal heat pump rebate from Elk River

Municipal Utilities. The municipal utility will also provide rebates for an Energy Star refrigerator, dishwasher and clothes washer installed in the house.

Attractive homes

Suburban Northwest Builders Association built the Energy House III with the city of Elk River to educate consumers about energy-efficient options. R-24 SIP walls, triple-pane Schuco windows, slab radiant heat and a geothermal heat pump are only a few of the energy-saving features in this all-electric show home. "The house is also packed with attractive features and plenty of curb appeal, because it will always have our name on it," said Greg Holst. Holst is president Northwoods Custom Homes, contractor for the Energy House.

Home buying is, after all, as much an emotional decision as a financial one. A home has to be attractive and inviting, or buyers won't bother to ask about its operating costs.

Albright pointed out that an energy-efficient home will look and operate just like a conventional house.

Combining good looks and efficiency is not a problem in Fontaine's view. "Because ICF is structural, you can build all shapes," he said.

Energy House III proved that by winning the Structural Insulated Panel Association award for building excellence. "We still want people to walk in and say, 'Wow it looks like any other house. It's beautiful and energy efficient,'" said Holst.

Elk River and SNBA held the open house for Energy House III on April 22—Earth Day 2006—and had an excellent turnout. Utilities outside the area can learn about the Energy House's features by taking the online virtual tour.

As Cass County Electric knows, if a utility is looking for ways to offer consumers comfort and savings, manage its load and protect the environment, there's no place like home. ⚡

Automated meter reading spreads through Western territory

Power providers as different as North Star Electric Cooperative, Salt River Project and Colorado Springs Utilities are adopting automated meter reading technology for reasons that are very much the same.

AMR allows utilities to reduce operating costs, improve customer service and manage loads more effectively. “It’s not just for reading meters,” said North Star Finance Manager Ann Ellis. “The system can detect outages, connect and disconnect service remotely and monitor off-peak accounts.”

Converting meters

The northern Minnesota utility is working toward converting all 6,200 of its accounts—10,000 meters—to automated Cannon Technologies units by the end of the year. North Star’s customers self-report their meter readings monthly, except for about 1,400 seasonal residents. The utility reads those meters and bills the seasonal customers annually. AMR meters will eliminate the need for customers or North Star to take manual readings and make the billing more consistent.

With more than 850,000 customers in the Phoenix area, SRP is in its third year of phasing in the EnergyAxis System for residential, commercial and industrial electricity and water metering. By the end of April 2006, about 75,000 customers had REX meters with an internal power service connect/disconnect switch.

Closer to SRP in size with about 600,000 meters, Colorado Springs will be deploying AMR units through

2010. The municipal utility chose wireless technology by DatasplICE LLC, noting that it would increase billing accuracy, speed complaint resolution and reduce employee injuries caused by restricted access to meters.

Increasing efficiency

Cutting down on field trips is one of the great advantages of AMR technology. SRP’s most recent system expansion included 25,000 meters on new homes on the outskirts of Phoenix and 25,000 meters in apartment complexes.

In a press release, SRP Revenue Cycle Services Manager John Soethe observed that the benefits of conversion included reduction in fuel costs, vehicle maintenance and insurance. “Projected savings from automated meter reading and automated field services have exceeded our expectations,” he said.

AMR makes line inspections more efficient and helps with restoring power. “After a storm, for example, a customer may not be home to report an individual outage,” said Ellis. “We can ‘ping’ the meters when we think everyone has power to see if there are any unreported outages still out there,” she said. “Also, if only one person reports an outage, we can check that meter remotely, without the cost of sending a truck with linemen to see if it is our problem or theirs.”

Load management

For North Star, however, load management was the strongest motivation for switching to AMR. The co-op offers its customers a

special off-peak rate of 3.6 cents per kWh for electric heating systems in exchange for interrupting those loads during system peaks. North Star’s power wholesaler, Minnkota Power Cooperative, administers the load control switching.

“The AMR system will help us monitor off-peak accounts to make sure they really are off during those critical times,” explained Member Services Manager Wayne Haukaas. “We will be able to shed them from the system during peak demand hours, and that will save substantial wholesale demand charges.”

The savings from detecting and correcting uncontrolled off-peak load before billing peaks are measured will provide a large part of the seven-to-10-year payback, said Ellis. Another beauty of the AMR system is that it finds those needles in the haystack, so a service representative is sent only to locations with problems.

North Star paid for the project with general funds and a USDA RUS loan. In addition to the meters, the co-op installed a computer control center in its Baudette office and is using its existing two-way radio system to communicate with the AMR meters with special relay equipment in each of the nine substations.

The investment will be worth it, not only in the near term but in the future. Detailed, accurate knowledge is power and utilities undoubtedly will find creative ways to use that knowledge to benefit both consumers and the bottom line. Some day, there will be as many reasons for adopting AMR as there are utilities. ⚡

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2006/june/jun067.htm

Nebraska utility, university partner on energy research center

Energy needs are a global concern strongly shaped by local factors like demographics, industry, climate and geography—a fact that makes Nebraska Public Power District's broad new initiative seem more sensible than ambitious.

The Nebraska Center for Energy Sciences Research, formed in partnership with the University of Nebraska—Lincoln, is actually a little of both. “NPPD has never done anything this big with the university system and we are very excited by the prospect,” said NPPD Corporate Communications Manager Beth Boesch.

The mission of the proposed research center is to conduct studies that will result in new technologies and processes for developing domestic energy sources, increasing energy efficiency and improving the state's quality of life and economic opportunities. NPPD announced in April that it will provide a total of \$5 million over the next five years to support that research.

This is an unusual step for NPPD since a utility's role in research often amounts to testing a system or program once it has been developed. But times are changing, said NPPD Corporate Nuclear Business Manager Alan Dostal. “Consumers have a tremendous awareness of energy issues today and expect solutions to be developed to address their concerns.”

Research partnership

The research center grew out of the Domestic Energy Research and Application initiative NPPD's board of

directors launched in October 2005. The initiative's stated mission is to learn how to use domestic energy resources in a clean, low-cost way to maintain our standard of living now and in the future. Developing new energy applications through research partnerships is key to fulfilling that mission. “Our own research center based in the state will allow us to support projects that address Nebraskans' concerns,” said Boesch.

The utility's long-standing relationship with UNL made the university a logical partner. Former NPPD CEO Bill Fehrman discussed the idea with UNL Chancellor Harvey Perlman, and the more they talked, the more it seemed like a great opportunity, recalled Dostal. “UNL is already doing extensive energy-related research,” he said. “The research center will build on that work and promote the university's expertise that ranges from engineering to agronomy to chemistry.”

The list of potential projects includes generation efficiency improvements, consumer energy efficiency and conservation, carbon and nitrogen sequestration, fuel cells, highly efficient battery-powered electric vehicles and more. Biomass, bio-refineries and wind energy are research areas that hold promise for economic growth in Nebraska.

NPPD wholesale customers are particularly interested in generation and delivery technologies. Maximizing effective water use is another pressing issue for the agricultural state.

More to come

UNL is tapping resources at the

Department of Energy, EPRI and the National Renewable Energy Laboratory to discuss possible projects. The center will issue a request for proposals later this summer.

Research priorities, project selection and the center's strategic direction will be determined by an advisory board of NPPD and UNL administrators. NPPD President and CEO Ron Asche, Board Chairman Wayne Boyd and Energy Supply Committee Chair Darrell Nelson represent the utility on the advisory board. A UNL faculty member is expected to serve as the center director.

One goal of the center is to become self-sustaining by attracting additional funding from state and federal agencies, other companies and foundations. Opportunities to collaborate with other universities and utilities are on the horizon.

Omaha Public Power District recently entered into a similar partnership with the University of Nebraska—Omaha to develop ways to reduce energy demand. Such partnerships position Nebraska's largest utilities to participate in national initiatives to develop new energy sources and improve the way we deliver and use power.

Nebraska Public Power District is hardly alone in facing those energy challenges. What is unique is the way NPPD is leveraging local assets—abundant agricultural resources and a close relationship with the state university system—to find answers that will best serve its customers, the environment and the state. ⚡

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2006/june/jun068.htm

Western plans workshops to demystify power factor

You're short of capacity. Your transformers or conductors are overheating or approaching their amp rating. Voltage is several percent lower at the load terminals than at the transformer secondary. Worst of all, your power wholesaler may be charging you a special penalty. If you have experienced any of these symptoms, you may be suffering from low power factor!

Is there a remedy for this condition? In fact, what exactly is the condition? In a nutshell, power factor tells how close your system is to delivering the maximum power possible for its available voltage and current.

A characteristic of alternating current circuits, power factor is always a value between 0.0 and 1.0. The higher the number, the better the power factor with 1 representing the ideal or "unity." Any time there is a phase shift, meaning the AC voltage and current wave are not in perfect sync time-wise, power factor is less than unity.

Business hurt

Unity power factor is the goal of every electric utility, since power factors below 1.0 consume system capacity, reduce system stability and are harder on transmission equipment. It can also cause billing problems. When power factor decreases to 0.6., meters do not read electricity use accurately. The end users may not be charged for power they are using, which is why industrial accounts are sometimes charged for electricity based on the efficiency of

their equipment and not just on the meter readings.

Poor power factor is primarily associated with industrial facilities, because of the large amount of energy business equipment uses. Circuits serving inductive or capacitive equipment like ballasts, personal computers and motors usually have a power factor below 1.0. Motors in particular affect power factor since the power supply sees motor windings as inductors.

Western requires its customers to maintain a power factor of .95 or better. A recent study by Western's Rocky Mountain Region, however, indicated that a number of meters in the area do not meet that standard. "The power factor needs to be brought back into range," said RMR Public Utilities Specialist Stacey Harris. "We need the help of our customers to do that, and they need a thorough understanding of the issues to help."

Workshops coming

Fortunately, providing Western customers with information just happens to be Energy Services' specialty. Western is planning a series of workshops on power factor improvement and distribution efficiency. "We're targeting rural Colorado, Wyoming and eastern Nebraska through larger power wholesalers," Harris said.

TriState Generation and Transmission and Municipal Energy Association of Nebraska are working with Western to set up workshops for late summer. Western's Upper Great Plains Region may schedule additional

workshops in 2007.

The one-day sessions will cover Western's requirements for power factor compliance and the value of improved power factor to decision-makers such as city managers, council members and utility superintendents. Participants will learn about the technical aspects of correcting power factor and how good power factor helps customer relationships. Speakers will present case studies and solutions to reducing utility system losses through distribution efficiency.

Utilities with large industrial customers should not miss Western's power factor workshop. "Any business account can affect a utility's power factor, though," UGP Energy Services Representative Michael Radecki pointed out. "Also, a utility near the end of the transmission line can be affected by industrial users further up on the system. This workshop will benefit all our customers and their end-users, too."

Check the Energy Services Web site for workshop dates and locations, or contact your regional Energy Services representative for more information. ⚡

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/2006/june/jun06coe.htm>

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2006/june/jun069.htm

New Equipment Loan manager has experience, plans

Replacing a loyal, long-time employee like Equipment Loan Program Manager Richard Burnkrant is never easy, especially when he ran one of Energy Services' most popular and successful programs. Fortunately, Gary Hoffmann has the right mix of enthusiasm and experience and he was right here at Western.

Spurred by Burnkrant's approaching departure, the Energy Services team formed a transition committee to evaluate the Equipment Loan Program and see if it could be improved. "We wanted to thoroughly analyze the program and that takes time," recalled Energy Services Representative Ron Horstman. "Rich was leaving at the end of 2005 and we were still sorting through the options, so we decided to fill the position temporarily with a current Western employee."

Although Hoffmann was working as a financial analyst at the time, he had a background in Energy Services. The Equipment Loan position sounded like a chance to return to engineering and do what he liked best. "I really enjoy working with customers," Hoffmann said, "and I wanted to get involved with renewable energy again."

First loan program

Working at Western since the Department of Energy formed the administration 29 years ago has given Hoffmann the chance to wear many hats. As an electrical engineer in 1979, he was part of the crew that built two wind generators at the Archer and Laramie substations in Wyoming.

"They only operated for about a year, but we learned a lot about the technology from those first turbines," he said of those early units.

Moving to the Power Resources department, Hoffmann joined the Conservation and Renewable Energy program and set up Western's first anemometer loan program. Measuring wind required some creativity back then, Hoffmann recalled. "There were some commercial units available, but we had to improvise a lot."

The program's first anemometers used revenue metering equipment to record data, and a method for translating that data had to be set up. "The Loveland [now Rocky Mountain Region] office metering department worked that out for us," said Hoffmann.

The piecemeal anemometers measured the wind velocity at about 200 sites. Later, the program acquired commercial units with data chips to record the information. "I could load that data into my laptop—excuse me, desktop computer," Hoffmann corrected himself. "We didn't have laptops."

Computers aren't the only things that have changed since Western's first anemometer loan program. "All of the equipment is more accurate, sturdier and less expensive now," said Hoffmann.



Gary Hoffmann worked on the Western crew that built a wind turbine in Archer, Wyo., in 1979. (Photo by Gary Hoffmann)

Setting priorities

And things will continue to change in the Equipment Loan Program. Since Hoffmann has arrived, Energy Services has added some new, lower-cost infrared cameras to its inventory. "More utilities are interested in buying units," Hoffmann explained. "The new models give them a chance to test the type of equipment they will be able to afford."

The new Equipment Loan manager would also like to do more field training with the regional offices, he said. Hoffman teamed up with Energy Services Representative Tracy Thorne from Western's Huron, S.D., office to conduct infrared camera mini-workshops in Wayne and Norfolk, Neb., May 17. The sessions offered engineers, supervisors and operations personnel from several utilities an overview of thermographic auditing and a hands-on introduction to Western's state-of-the-art infrared cameras. Hoffmann demonstrated

*See EQUIPMENT LOAN MANAGER
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**Want to know more?
Visit www.wapa.gov/es/pubs/esb/2006/june/jun0610.htm**



Energy Shorts

June is National Safety Month

This year marks the 10th anniversary of the National Safety Council's designation of June as National Safety Month. The 2006 theme – making the world a safer place – is one that every utility can support.

Through NSC's utility division networking group, professionals in the electric, gas, communications and water services can work to improve safety on the job. The utility division collaborated with the American Public Gas Association and the U.S. Department of Transportation to create the Natural Gas Safety Handbook for Utility Workers and Contractors.

Consumer safety is of equal importance to utilities. NSC fact sheets are an excellent resource for developing safety tips for customers. Topics include utilities and structure safety after a flood, combustion appliances, indoor air quality and carbon monoxide.

For utilities, every month is safety month, but June is a great time to remind customers that safety is everyone's concern. It takes team work to make the world a safer place.

DEED wind case studies

A new collection of wind project case studies, prepared by the American Public Power Association's Demonstration of Energy Efficiency

Developments program, explains why public power leads investor-owned utilities in wind development.

Public Power Investments in Wind spots development trends and opportunities for new and growing public power wind programs.

The collection includes the utility-scale AMP-Ohio development in Bowling Green, Ohio. Projects were chosen to reflect a good sampling of all the possible choices nationwide, said Project Director Michele Suddleson.

Suddleson suggested that the case studies might be a good companion resource for some of DEED's technical publications. DEED recently published two detailed reports on wind integration and impacts of wind supplies on bulk power systems. A new brief, *Wind Power, Public Power Utilities*, highlights some new incentives and challenges to wind development, such as price increases and delays in turbine delivery due to a worldwide wind boom.

New white tag market

Move over green tags and make room for white tags – energy efficiency credits which represent 1 MWh of energy savings. The latest energy product to hit the market is an alternative to renewable energy credits and trades in a similar way. Instead of being tied to creating and delivering renewable power, white tags come from reducing energy use

and are measured through software and control technology.

It offers a way of rewarding businesses and others for implementing demand-side management programs.

Connecticut will implement the first state white tag standard in 2007. Nevada and Pennsylvania have also adopted legislation requiring white tags as part of a mandated state portfolio standard. Jones said that white tags originated in the United Kingdom, France and Italy.

White tag trading currently follows Connecticut REC trading, with prices ranging between \$30 and \$50 per MWh. However, Jones expects the price range to drop to \$15 to \$30 per MWh on a national average because Pennsylvania and Nevada do not have established trading markets. Sterling Planet is beginning to sell white tags on its Web site.

Congress to extend tax credits

In response to skyrocketing electricity and gas prices across the country, 32 members of Congress introduced legislation in the House and Senate to extend solar energy and fuel cell investment tax credits for homeowners and businesses through 2015. The credits are currently set to expire next year.

Reps. J.D. Hayworth and Michael McNulty, and Senators Gordon Smith and Robert Menendez sponsored H.R. 5206 and S. 2677, the "Securing

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Want to know more?
Visit www.wapa.gov/es/pubs/esb/2006/june/jun06es.htm

Energy Shorts

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America's Energy Independence Act." The legislation builds on a stand-alone solar extension bill Rep. Ferguson introduced in 2005.

Initial co-sponsors in the House included Reps. Dave Camp, Michael Fitzpatrick, G.K. Butterfield, Sherrod Brown, Rob Simmons, Daniel Lipinski, Mark Udall, Spencer Bachus, Vern Ehlers, Thadeus McCotter, Maurice Hinchey, John Sweeney, Mike Rogers, Charles Dent, John Doolittle, Frank Wolf, Roscoe Bartlett, Ben Cardin, Mary Bono, Zach Wamp and Michael Ferguson.

In the Senate, initial cosponsors included Senators Joseph Lieberman, Olympia Snowe, James Jeffords, John Kerry, Maria Cantwell, Ken Salazar and Hillary Clinton.

The Energy Policy Act of 2005 provided a 30-percent tax credit for solar systems purchased for both residential and business applications. However, these credits will expire after two years without legislative remedy, a term too short to encourage significant industry growth. Both bills both include provisions to extend the residential solar tax credit for residential solar water heating, photovoltaic equipment and fuel cell property, as well as the business solar tax credit and fuel cell tax credit to December 31, 2015.

Geothermal power double

The future is bright for geothermal power in the United States, according to a report released by the Geothermal Energy Association in March.

The 2006 Update on U.S. Geothermal Power Production and Development reviewed geothermal

projects worth a prospective combined 2095 MW, planned for development in Alaska, Arizona, California, Hawaii, Idaho, New Mexico, Nevada, Oregon and Utah. Developing those projects would nearly double the current total U.S. installed capacity of 2,828 MW.

California, with 2,492 MW of installed capacity, has 752.9 MW under development. The U.S. Geological Survey is reviewing 11 pending lease applications near Mt. Shasta for Bend, Ore.-based Vulcan Power Co., which is interested in developing one of the sites for 30 MW to 60 MW.

The survey said that Nevada could triple its 274.4 MW with 365 MW in various stages of development. Another 182 MW of potential development are under review. Utah's 26 MW could increase sevenfold with 36.6 MW scheduled to come online by December 2007 and a 100-MW development at Roosevelt Hot Springs likely. In Hawaii, current installed

capacity of 35 MW will see a doubling in the near future.

Oregon has no previous geothermal development, but Nevada Geothermal is in the exploratory drilling stage for 20-MW Crump Geyser. The 120-MW Newberry Crater is in the final permitting stage by Vulcan Power.

In Idaho, U.S. Geothermal is building the 10-MW Raft River Project, and is in the final permitting stage to expand the project by 20 MW. Idatherm discovered an additional 200 MW of geothermal potential in the state, and may undergo permitting in the near future. Arizona, Alaska and New Mexico each have 20 MW of geothermal projects in various phases.

GEA Executive Director Karl Gawell credits the Energy Policy Act of 2005 with the surge in geothermal development. EPAAct made geothermal plants eligible for the full federal production tax credit, previously available only to wind projects. ⚡

Equipment Loan manager

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the cameras, then fielded questions about the Equipment Loan Program from a group of very engaged participants.

The Energy Services Web site offers more possibilities for training, Hoffmann added. He would like to develop "Frequently Asked Questions" and helpful tips for each piece of equipment. "This would take care of some of the routine, easily-solved problems that come up because people are unfamiliar with the equipment," said Hoffmann. "I

tend to get two or three calls at once about the same problem."

Hoffmann would also like to share case studies from past equipment loans. "Some of our customers have gone way past the basics," he said. "Their innovative ideas for using and operating the equipment could be a great resource for the program."

The same could be said for Gary Hoffmann.

If you are interested in arranging equipment training in your area, contact Hoffmann at 720-962-7420 or your regional Energy Services representative. ⚡