



Energy Services **BULLETIN**

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

WINDPOWER connects utilities with wind power growth

The industry that grew 15 percent in 2010 and now provides 20,000 manufacturing jobs across 42 states is holding its annual conference and exhibition in Anaheim, Calif., May 22 to 25. Will you be there?

Big and getting bigger

WINDPOWER 2011 brings together hundreds of companies and thousands of wind energy professionals, making it an ideal place for utilities to connect with the industry. "This is simply one of the best renewable energy events in the country, and not only for wind power," said Randy Manion, Western Renewable Energy Program manager. "Western customers should take advantage of the fact that this year's WINDPOWER is in our territory and plan to attend."

Western's territory has almost 14,000 MW of installed wind capacity and includes the state that first developed utility-scale wind energy projects. "The rest of the United States



has been able to draw on California's experience integrating wind energy as a viable power source of electricity that supports our growing energy needs." said Jeff Anthony, Business Development director for American Wind Energy Association.

Thanks to the expertise and support built up over the years in places like California, Texas and Iowa, the wind industry weathered a difficult 2010. The renewable resource continues on track toward the goal of supplying 20 percent of the nation's electricity by 2030. Utilities need to prepare for a future that includes wind energy, even in a climate of economic downturn and unstable national policy. "In planning WINDPOWER, AWEA has again focused on putting together a program to help our utility members to think about the opportunities wind presents," said Anthony. "A number of utilities advised us this year in putting together our utility track, and those sessions show the

results of working with some of the leading power providers in the country on wind power development and growth."

To continue to encourage new participation in the event, two travel scholarships of \$500 each is available to Western customers who will be attending WINDPOWER for the first time. Applicants must be from a power provider that has not participated in previous WINDPOWER conferences. One scholarship will be awarded to an eligible cooperative employee and one to a municipal utility representative. The deadline to apply for the scholarships is May 15. Call Randy Manion at 720-962-7423 for more information.

Sessions cover it all

Newcomers to the industry can start with Wind 101, a pre-conference session on May 22 that provides

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WINDPOWER 2011

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an introduction to wind energy. Continue your education the next afternoon, when Wind 101 sessions split into a transmission track and a performance track.

The utility track sessions on May 24 provide an in-depth exploration of the concerns and challenges specific to power providers. A panel of speakers representing regulatory, legal, financial and utility viewpoints will discuss how state wind policies affect long-term wind power contracts. In the resource planning session, learn about the diverse strategies employed by utilities across the country to integrate wind into their power portfolio. Wrap up the day with wind project case studies from utilities and from the California Independent System Operator.

Some issues affect everyone involved in the wind industry, and for a perspective on those topics, Anthony recommends attending the power sessions. The Wind 101 performance session on improving project profitability and the utility

session on long-term power contracts are both power sessions. Other power topics include resource assessment, state and Federal wind policy and international wind development.

Ready, set, network!

The sessions are a good place to learn about the industry or to get an update on the latest developments, but nothing beats the WINDPOWER special events for really making connections. Two events will be of special interest to utility professionals. On Tuesday, the day of the utility track, the AWEA Utility Working Group is hosting a working lunch and inviting AWEA utility members. This is an opportunity for utility attendees to discuss wind power issues with the working group and offer input on its further efforts and initiatives. Later that evening, AWEA is sponsoring a VIP utility reception from 5 to 6:30 p.m., to recognize utility interests in the expanding wind industry. Attendees must RSVP for both events.

In addition to the utility events, you'll be able to bond with colleagues, discuss projects and research and meet wind equipment, product and service vendors during receptions, breaks and the ever-popular exhibition hall happy hour. The athletically inclined can sign up for the pre-conference golf tournament May 21 or the WINDPOWER Scholarship 5K Race May 25. Both events raise money for the AWEA Scholarship Program, which provides educational scholarships for individuals to attend AWEA conferences.

And, of course, you can't go to Anaheim without paying a visit to

Mickey Mouse. On Monday night, AWEA hosts a two-hour networking event at the Disney California Adventure Park, after which WINDPOWER attendees may enjoy the rides and attractions. The ticket is included in all main conference registration packets, and up to two additional guest tickets may be purchased.

Tuesday night brings another event not to be missed: entertainer Jay Leno hosts the annual WINDPOWER Conference Dinner.

Membership has privileges

Utilities that have not yet joined AWEA may want to consider doing so now, especially if they are planning to send more than one representative to WINDPOWER 2011. AWEA member discounts are available to each of the member organization's registrants, starting at the U1 membership level.

Higher membership levels receive additional registration discounts—U2 members can take advantage of a "buy two, get two free" utility registration discount for full conference attendees. Utilities at the U3 membership level or higher can get five full conference registrations for the price of two. Contact AWEA membership to confirm your utility's level, or sign up to become a member.

Whether your utility is a member of AWEA or not, wind power is likely in its future. You can start building the knowledge and contacts you will need to shape that future by registering to attend WINDPOWER 2011. ⚡

Energy Services Bulletin

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

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Want to know more?

Visit www.wapa.gov/es/pubs/esb/2011/may/may11.htm

Colorado Springs builds smart grid one pilot program at a time

The key to getting consumers to accept change is to introduce it gradually, let them see the benefits and then move to the next phase—at least that's the strategy Colorado Springs Utilities is using to modernize its grid.

Smart grid deployment has frequently met with resistance from ratepayers—in part, because consumers (and often utilities) don't have a clear understanding of what "smart grid" is or what benefits it can deliver. There is also the creeping suspicion among some customers that they will end up paying for a technology that helps their power provider but doesn't do anything for them.

Such "blowback" has not interfered with Colorado Springs Utilities' steady progress toward a smart grid. "It's a different story when you are a customer, as well as an employee of the utility," explained Dennis Atkinson, supervisor for the municipal utility's AMI and Advanced Technologies Program Development.

One-way first

The multiservice (gas-electric-water-wastewater) provider recently finished deploying more than 530,000 automated meter-reading (AMR) electric, gas and water units with one-way communication capability, a project begun in 2005. Getting customer buy-in was mainly a matter of outreach, recalled Atkinson. "Our key account representatives worked one-on-one with our large business customers," he said. "On the residential side, we made a point of scheduling the installation when the customer was



A customer service representative at Colorado Springs Utilities helps a ratepayer resolve an issue. The automated meter reading equipment the utility has installed over the past six years is helping to improve customer service. (Photo by Colorado Springs Utilities)

home, which was necessary anyway for water meters. Sometimes it took five or six attempts, but it was worth the effort."

The single largest benefit resulting from installation of the AMR system was the ability for the utility to reduce its field technician positions by attrition, which helps to control rates. Many other "soft" benefits were realized, such as employee safety and customer satisfaction. Automated readings and daily/hourly use data have enabled the utility to improve its billing processes, adopt new rate options and reduce the number of estimated bills to 1 percent of final billings. "AMR helps us to be more responsive to our customers' needs, so we are seeing increased customer satisfaction," said Atkinson.

AMR deployment taught Colorado Springs Utilities some lessons that will help to speed up its return on investment for further upgrades. For example, developing specific steps for meter specialists to follow for testing and installation will help to

prevent equipment malfunctions in the field.

The utility has also honed its cost/benefit analysis and business case templates to ensure that further deployment of two-way meters demonstrates value to both the customer and utility. "Two-way meters are significantly more expensive than AMR meters, so there needs to be a strong business case for installing this technology," said Atkinson. "We have to ask where the value is for our customers in replacing the recently-installed AMR meters with newer two-way meters."

Taking the next step

Two-way meters make sense for those customers who want additional information about their energy consumption, added Atkinson. Such information could help the utility and its consumers work together to save resources and keep rates down. Characteristically, Colorado Springs Utilities is taking the slow and steady

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approach to demonstrating that to customers.

The first pilot targeted large commercial and industrial (C&I) customers, most of whom participate in voluntary curtailment and time-of-use (TOU) programs. C&I accounts are generally more receptive to tools and programs that help them manage their energy costs. In fact, a Colorado Springs shopping center that was scheduled to receive a two-way meter in the second round of deployment asked for an earlier installation date.

Two-way meters also enable net-metering for residential and C&I customers with solar photovoltaic arrays, so that customers can choose to use their own electricity first. With net-metering, the customer's generation system is interconnected with the utility's delivery system so that the customer's may receive electricity either from his own generator or from the utility. The customer is billed for the amount of energy received from the utility. If the home system produces more energy than the customer uses, he receives a credit from the utility.

Multi-family complexes, with tenants moving in and out, offered another opportunity to show how two-way meters could add value. Colorado Springs Utilities is installing 3,500

two-way meters with integrated remote connect/disconnect switches on multi-family housing units to increase the efficiency of service disconnects.

Smart grid for DSM

Another pilot program represents a more sophisticated use of smart grid technology. Colorado Springs Utilities has installed more than 150 two-way meters—and could install another 140 of the units—in an area of town where the distribution substation may need augmenting because of high peak demand. These new meters will support residential DSM and TOU programs in the area that could potentially defer the need for a system upgrade. “Our hope is that those customers who participate will see the value of helping to stabilize rates and conserve energy. The alternative would be to add more capacity to the circuit which would be more costly,” Atkinson acknowledged.

The two-way meters will allow the utility to respond to peaking loads and high demand for energy by partnering with customers to curtail their electricity use. In the next year or so, residential customers may opt in to receive alerts by voice mails, e-mail and text messages, like the C&I customers in the utility's current DSM and pricing programs.

Atkinson expects the program, slated to launch this summer,

to produce plenty of data about how being able to view and manage energy and water costs affects customer use.

Colorado Springs Utilities is also scheduled to implement the first phase of its Meter Data Management System (MDMS) this summer. The MDMS will validate, store, send and receive vast amounts of meter data to and from various utility business operations and systems. This warehouse of daily meter data will help the utility provide customers with new information, options and services, and drive business savings and process improvements in utilities operations.

The utility is also launching a web portal later this year that will allow every customer to view their use free of charge. This information on electric, gas and water services will be updated daily, and, for selected customers, offer hourly or more frequent updates.

The ultimate goal of this step-by-step smart grid implementation is to develop distributed generation—solar and wind—and energy storage to complement the utility's conventional generation portfolio. And when Colorado Springs Utilities reaches that destination, Springs residents will be right there with their utility, enjoying reliable, affordable service. ⚡

Want to know more?

Visit www.wapa.gov/es/pubs/esb/2011/may/may112.htm

Western cosponsors Tri-State commercial lighting workshop

Keeping in mind that not all low-hanging fruit is created equal, Tri-State Generation and Transmission Association and Western have teamed up to show utilities how to take a bite out of the “watermelon” with a Commercial Lighting Workshop, May 25.

Utility employees, key account representatives and member services managers can bring their questions about lighting programs and technologies to this one-day workshop at Tri-State’s Westminster, Colo., headquarters. Western customers and Tri-State member systems don’t need to break their training budgets, either—the workshop is being offered free of charge.

Opportunities abound

Tri-State is shifting its focus from residential to commercial lighting efficiency, partly due to the success of residential programs. Compact fluorescent lights (CFLs) are now mainstream technology, readily available to consumers at an affordable price. However, the G&T’s recently released energy-efficiency potential study indicated that there was still plenty of room for improvement on the commercial side. “There is a lot of innovation going on in lighting, and it has the potential to make a big difference in businesses’ operating costs,” said Tri-State Energy Marketing Coordinator Keith Emerson.

Bob Langenberger, Rocky Mountain Region Energy Services representative, agreed. “Commercial lighting upgrades can also help utilities with their load management goals, and build

stronger customer relationships,” he added.

Comprehensive agenda

The workshop will provide participants with a good, basic understanding of lighting types, including current and emerging technologies and common applications for each. The best energy impact and paybacks for energy efficiency retrofits will be covered, along with specific steps utilities can take to ensure customer satisfaction with the lighting upgrade.

At the beginning of the workshop, attendees will have the opportunity to talk about lighting programs their utilities are currently offering. A quick overview of lighting basics will follow, so no one is left in the dark. “We wanted to make the training accessible even to participants with no lighting experience,” noted Langenberger. “The technology has changed so much over the last decade that everyone can benefit from a short review.”

The rest of the morning agenda will focus on lighting technologies, including CFLs, LED, linear fluorescent, induction and plasma lighting. Participants will learn about appropriate applications and how the options compare with each other.

The afternoon session opens with a question-and-answer period, and a look at the bonus savings lighting controls can offer. Case studies will present the results of retrofit projects undertaken in businesses typical in rural and municipal power territories. Participants will receive reference materials and tools to help their C&I customers get

started on lighting upgrades and contact information for ongoing support. The workshop wraps up with an update of Tri-State’s lighting efficiency incentives.

Help for utilities, consumers

Rob Kirkpatrick, COO of Service Concepts, is the featured speaker at the Commercial Lighting Workshop. His presentation is the product of years of experience working with lighting experts and implementing successful utility programs in the field. “Commercial utility representatives typically do not have the time or the need to become lighting experts,” Kirkpatrick said. “This one-day workshop zeroes in on the key factors in common commercial lighting efficiency situations that will help them identify opportunities and make improvements happen.”

Service Concepts serves as a scout, evaluator and purchasing negotiator for innovative new energy-efficient products and services for electric cooperatives. A group of 30 electric co-ops in Indiana formed the organization in 1999 to help public power providers address the energy and telecommunication issues facing their consumers. “We provide the tools and back-up support that enable commercial utility generalists to offer their consumers real, cost-cutting solutions geared to the account, the utility’s objectives and available incentives,” said Kirkpatrick. “The result is a substantial energy and demand reduction, short investment payback and appreciation for

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Question:

We need information on using photovoltaic cells to generate electricity for a lighting system we are planning as a demonstration project at the local food bank.

Answer:

It is great that you are interested in energy conservation and renewables – and that you are willing to fund a demonstration that will benefit your community.

A lighting system using photovoltaic cells (PVs) to generate power is going to be more expensive than a conventional lighting system due to the relatively high cost of the PVs. To cut down on the number of expensive PVs you'll need to achieve the necessary lighting level, it pays to use the most efficient luminaires (lights) available. The most efficient lighting options available commercially today are LEDs, compact fluorescent lamps (CFLs), and super T8 and T5 fluorescent lamps.

Since PVs produce direct current (DC) and luminaires such as fluorescent lamps use alternating current (AC), you will need an inverter to transform the DC into AC at the proper voltage. Inverters are expensive devices, and they will cause a system to lose a little efficiency in the conversion process. By choosing an LED for your lighting source, you can do away with the need for the inverter, save money and improve the system's reliability and

efficiency. If you plan on using the lighting system at night, you'll need a battery storage system consisting of a bank of batteries and a charge controller to prevent over-charging the batteries.

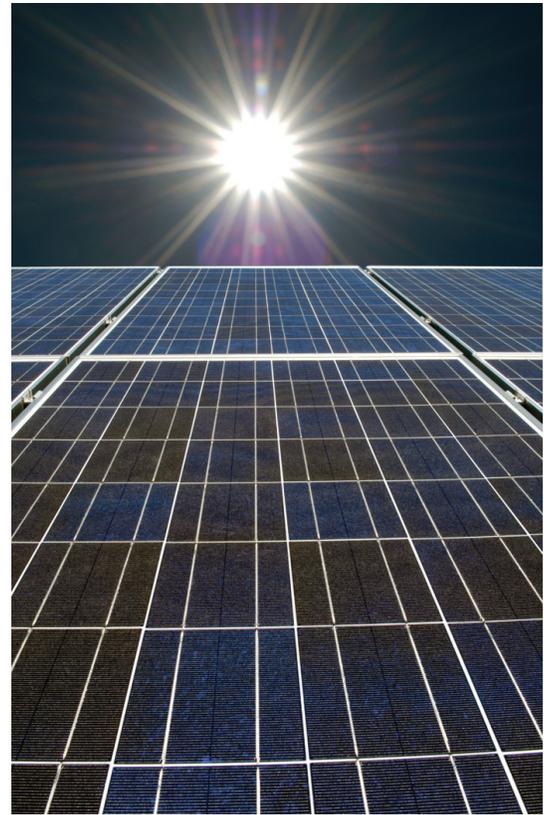
Lots of practical "hands-on" information on photovoltaic systems is available on Small Solar Electric Systems from the DOE Office of Energy Efficiency and Renewable Energy. You'll find many valuable resources including explanations of how various systems work, system components, installation details and more.

Sandia National Laboratories has an excellent PV library. Many of its resources are similar to the EERE resources, but offer a slightly different perspective.

There are a number of handy resources at Find Solar, including a directory to help you find a PV system installer in your area, and a calculator to help you size your PV system.

Another way

In addition to PV systems, there are several other, simpler ways to harness the sun to light buildings. Although not as exciting or innovative as photovoltaic lighting, daylighting is often the most cost-



effective choice for efficient lighting. Skylights, light tubes, light shelves and plain-old windows are simple, effective ways to light with the sun.

Better Bricks, the commercial building initiative of the Northwest Energy Efficiency Alliance, provides a detailed look at what you can and can't do with daylighting. The Seattle Lighting Design Lab also has a number of excellent articles on daylighting design—scroll down the page to the Daylighting category.

Good luck with your project! ⚡

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2011/may/may114.htm

There are plenty of resources to help utilities capture the “low-hanging fruit” of energy efficiency—significant savings, increased consumer awareness and stronger customer relationships. But where is a power provider to turn for advice on going deeper to reduce a building’s energy consumption by as much as 50 percent? Check out Retrofit Depot, an initiative to provide energy-efficiency solutions for commercial buildings.

The Rocky Mountain Institute, or RMI, created the website with the help of companies and organizations dedicated to energy efficiency to support for deep commercial retrofits. According to RMI, deep energy retrofits improve the economics of efficiency and achieve bigger energy savings at equal or lower cost than conventional, shallow retrofits. Utilities will recognize that deep retrofitting one large commercial building will have more impact on load management goals than dozens of residential energy-efficiency upgrades. And that doesn’t even take into account the indirect benefits of deep retrofitting to the local economy, the environment and energy security.

Confusing navigation

The Retrofit Depot home page is simple, if a little confusing. In the middle of the page, visitors will find the main navigation buttons:

- Deep Retrofits
- How to Retrofit
- True Stories
- Tools and Resources



The energy-efficiency retrofit of the Empire State Building illustrates the results possible through leveraging the deep retrofit process. (Photo by Rocky Mountain Institute)

The same categories seem to be repeated in big color blocks surrounding the central bar, but these links don’t necessarily link to the same pages as the navigation buttons. When you mouse over each color block, an explanation pops up

and gives you the option of reading more. While the entire pop-up box is live linked, you must select “more” to navigate to that page. Clicking elsewhere on the box just refreshes the home page.

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To get to the excellent resources Retrofit Depot has to offer, visitors should stick to using the main navigation bar in the middle of the page.

From talk to action

Start at Deep Retrofit if you need to convince a large key account of the benefits of a deep retrofit—or need to be persuaded yourself. This page will explain why to retrofit and the importance of choosing the time for the project. Visitors will find links to reports that help make the business case for the significant investment deep retrofitting requires. Or you can just ask Dr. Retrofit how to successfully drive retrofit projects in your own or another organization.

Once the case is made, it's time to learn how to retrofit. Here again, the site design sacrifices

clarity for cleverness—the retrofit process is presented as a row of buildings labeled with the key steps. Mousing over each building reveals a pop-up explanation with a link to more information. Like the home page, you'll have to click directly on “Learn more” to get to that page.

Persistence will be rewarded, however, as each of these pages provides in-depth details, including comparisons with the traditional retrofit process and links to reports and best practices. On the right side of the “how-to” pages is a list of topics that have their own set of resources in the site's browse library. The resources address issues such as financing and institutional barriers, cover specific types of projects like college campuses and public buildings and discuss materials and systems used in retrofits.

Examples, tools to help

Speaking of libraries, the

third button on the navigation bar takes visitors to True Stories from projects RMI has supported. These case studies offer valuable information about financing, planning and implementing deep retrofits. The best known of these case studies is the Empire State Building project, completed in September 2010, and expected to save 38 percent of its previous energy use.

The final section (which logically might have preceded True Stories) is dedicated to Tools and Resources. Visitors can download a number of free tools here, ranging from a presentation that makes the financial case for pursuing deep energy efficiency to RMI's extensive Energy Modeling Toolkit. These tools can help projects achieve the greatest energy savings within a given budget. ⚡

Want to know more?

Visit www.wapa.gov/es/pubs/esb/2011/may/may15.htm

lighting workshop *from page 4*

the utility's guidance.”

Maintaining profitability in the face of rising energy costs is a particularly pressing issue for businesses in small towns

and rural areas. Tri-State and Western believe that training provides utilities with the tools to teach their large key accounts how to manage their energy consumption more effectively. Don't miss this opportunity to help your

C&I customers—register for the Commercial Lighting Workshop today. For more information, Western customers can contact Bob Langenberger at 970-461-7481. Tri-State members can email Ron Ebenkamp. ⚡

Want to know more?

Visit www.wapa.gov/es/pubs/esb/2011/may/may13.htm