

BULLETIN

Western's monthly energy efficiency and planning newsletter dedicated to customer activities and sharing information.

FORT COLLINS REIMAGINES ENERGY FUTURE

Beneath the old-fashioned brick buildings and cobblestone walkways of Fort Collins, Colo.'s Old Town, a modern energy revolution is happening.

The community that served as one of the models for Disneyland's Main Street USA is turning into a model net-zero energy district through energy conservation, energy efficiency, renewable energy and other smart technologies. FortZED, as the plan is called, has brought together the municipal utility, clean energy activists, businesses, academia and city residents in a long-term commitment to tackle a truly monumental task.

THE STARTING LINE

The 4-square mile district encompasses the main campus of Colorado State University and serves about 7200 residential and business customers. It represents 10-15 percent of the city's total electricity distribution, with eight distribution feeders, about 50 megawatts (MW) of demand and more than 200,000 megawatt-hour (MWh)/year use. Currently, coal-fired power plants provide about two-



The Larimer County Courthouse was one of several buildings that received efficiency upgrades as part of the FortZED project to create a net zero energy district in downtown Fort Collins, Colo. (Photo by FortZED)

thirds of the city's electrical needs, and renewables just 5 percent.

FortZED envisions the downtown district becoming super energy-efficient, and then drawing its remaining electricity needs from local renewable resources within a 50-mile radius. Strategies for achieving net-zero energy include:

- Reducing energy use in buildings
- Developing local renewable generation
- Managing peak load
- Implementing smart grid technologies

Implementing those strategies

entails a multipronged approach of research and development, public policy, economic development and community engagement.

The effort to turn the thriving, mixed-use area into a zero-energy district (the ZED in FortZED) started in 2007. Fort Collins Utilities joined forces with the regional think tank UniverCity Connections and the Colorado Clean Energy Cluster (CCEC), a green business development group, to position the city at the forefront of the new energy economy.

The project they had in mind, at first glance, seems to be far beyond a

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city of 150,000, but proactive vision is part of the culture of Fort Collins. The municipal utility was one of the first in the country to bury its distribution lines back in 1945. "Our historic practice of innovation put us where we are today," said Utilities Manager Steve Catanach. "The FortZED is giving us the opportunity to look at the new technologies we think are coming next."

A SMARTER GRID

Renewable and Distributed Systems Integration (RDSI) is one of the technologies on the city's radar. This systems approach to balancing and controlling a large number of distributed-generation and demand-side resources for peak management was the subject of a series of projects undertaken by the Department of Energy (DOE).

Working with the FortZED steering committee, the utility landed a grant of \$6.3 million from DOE to participate in the RDSI study. The funding, with matching grants, was used to build an infrastructure capable of activating

and managing solar photovoltaic (PV) systems, diesel generators, gas turbines and thermal storage, and shedding load from various locations. "DOE's support helped to jumpstart FortZED," recalled Dennis Sumner, senior electrical engineer with the city and the RDSI project manager.

Partnership again played a critical role in the three-phase project. Site partners—facilities located in the district with renewable energy systems connected to the grid—included the city, Larimer County, CSU, New Belgium Brewery and CSU Engines and Energy Conversions Laboratory (EECL). Energy technology companies Advanced Energy, Spirae and Woodward were technical partners, bringing resources, hardware and software to the table. As consulting partners, Brendle Group and CSU provided leadership, project management, integration and evaluation.

The goals of RDSI were as diverse as the partners. Technical partners and the utility focused on peak load control and infrastructure, while site partners aimed to reduce peak load without negatively affecting either their operations or energy expenses. During RDSI operation, site partners generated and shared power, cut their power demand or both. In the first testing phase, the new system resulted in 20-percent drops in peak electricity demand on a single circuit, among the best performances of all DOE RDSI projects.

Inspired by the system's impressive performance, FortZED went a step further to demonstrate islanding, another dimension of RDSI. EECL and the Atzlan Community Center are attempting to get load to match distribution and run separate from the rest of distribution. The end of this final testing phase will coincide with the end of the Fiscal Year 2013.

Some aspects of the RDSI demon-

stration were more theoretical than practical, acknowledged Sumner, like using diesel generators to deal with peak. "You couldn't necessarily make a business case for everything we did," he said. "But the facility managers stepped up anyway to honor the spirit of the study."

"All of the RDSI partners really came through," Catanach agreed. "I have to applaud them."

DON'T FORGET EFFICIENCY

Less glamorous than RDSI, but just as important to FortZED goals, is the reduction on energy use in public buildings within the district.

The Colorado Department of Local Affairs (DOLA) and the Governor's Energy Office gave Fort Collins a New Energy Communities Grant in 2009. The city partnered with Larimer County, Fort Collins Housing Authority and Poudre Valley Regional Library District to leverage \$778,000 of state money and raise another \$2 million in local matching funds. The money financed efficiency improvements to public buildings inside and outside of the district and installation of several solar PV arrays.

The projects within the FortZED district included the Civic Center, City Hall, Fort Collins Justice Center, Health and Environment/Cooperative Extension and Human Services facilities in Fort Collins and Poudre River Public Library. The buildings' heating, ventilation and air conditioning (HVAC) systems were recommissioned, and the building shells of the city facilities were upgraded. The utility installed a solar thermal project on the Atzlan Community Center. The library received an interior lighting retrofit and new controls for its HVAC system.

The funding also covered energy-efficiency improvements and solar installations outside the FortZED

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ENERGY SERVICES BULLETIN

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footprint. The EPIC Recreation Center and the Loveland Courthouse received energy-efficiency upgrades. A solar PV project was added to the recreation center and the Solid Waste Administration Building. Fort Collins Housing Authority installed a PV system on a newly constructed clubhouse, and leveraged other funding sources to fully renovate some apartments and install a solar thermal system on the complex.

In the first year following renovations, the projects saved over 3000 MWh of electricity and over 850,000 therms of natural gas. But like other FortZED projects, the DOLA grant brought benefits beyond savings. Although the Civic Center had been built in 2001, it had building envelope issues. "The industry wasn't as aware of the importance of commercial building envelopes at the time," said Fort Collins Energy Services Manager John Phelan. "The most significant part of the project was being able to first evaluate, and then go back and fix the problems."

Phelan added that the city now includes air leakage testing in its commercial building code, partly as a result of what they learned from the project.

POWER TO THE PEOPLE

As any utility program manager will tell you, technology alone cannot achieve deep reductions in energy use—you have to get the consumer into the game. A second major FortZED project, the Community Energy Challenge, is a grassroots campaign designed to do just that.

In 2010, the committee worked with several community members and The Atmosphere Conservancy, a nonprofit community group, to increase energy efficiency and conservation practices among residents. Volunteers organized

"Thanks to FortZED, the city has become a leader in green technologies," he said. "That attracts more partners and opportunities."

mixers at their homes and got their neighbors to sign pledges to reduce energy use in their homes. Pledgers received energy-saving tips, along with information about the utility's residential programs. More than 2,100 people have signed up for the challenge to date.

With so much of FortZED focused on advanced technology, the utility has made a point of honoring the grassroots nature of the campaign, said Catanach. "The Community Energy Challenge is as much about consumer education and empowerment as it about saving energy," he observed.

Fort Collins customers won't be left out of the technical upgrade, however, because the city is in the process of replacing all electric and water meters with smart meters. The metering rollout is on schedule to provide homeowners, businesses and schools with more data to help them understand and control their energy use.

GOOD FOR EVERYONE

FortZED will need those engaged consumers to reach its net-zero goal within the 2025 timeframe. Catanach estimates that the city is about 15 percent of the way there, but sees momentum building from the early successes. "Thanks to FortZED, the city has

become a leader in green technologies," he said. "That attracts more partners and opportunities."

Attracted by the opportunity to see cutting-edge distribution in action, Rocky Mountain Institute (RMI) is getting involved with FortZED. Fort Collins Utilities is now working with RMI to explore changes in customer offerings that might increase adoption of energy-efficiency measures and solar PV installations. The utility has already implemented a feed-in tariff and on-bill repayment of energy-related investments. Other proposed strategies include creating incentives that reflect the value of distributed energy resources, and launching an energy services company that offers small customers integrated packages of energy-efficiency improvements, solar PV and other options.

Project partners have increased their expertise and their reputations, and that has benefitted the local economy. Pointing to just one example, Catanach said, "Woodward is relocating its world headquarters in Fort Collins, partly because they are able to showcase their technology here."

Even Platte River Power Authority, the municipal utility's power wholesaler, has benefited from FortZED. To support the project's goals, PRPA is now conducting a transmission line study in hopes of bringing on 30 MW of wind power later this year through a power purchase agreement.

So, even though FortZED has miles to go, project partners are optimistic and ready to tackle new challenges. "The only thing we know for sure is that the future is going to be different than today," admitted Catanach. "FortZED is giving us the chance, not just to investigate the possibilities, but to shape them." 

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

WESTERN ADMINISTRATOR KEYNOTES ROCKY MOUNTAIN UTILITY EFFICIENCY EXCHANGE

Western customers who attend the seventh annual Rocky Mountain Utility Efficiency Exchange (RMUEE), in Aspen, Colo., Oct. 9-11 will have the opportunity to meet Mark Gabriel, Western's new administrator, and hear his views on the challenges facing utilities today.

The popular conference opens Oct. 9 with keynote speaker Jeff Ackermann, director of the Colorado Energy Office (CEO). Gabriel, who was selected to head up Western in April 2013, will deliver the midpoint keynote address on Oct. 10. "We are fortunate to have two keynote speakers with diverse experience and expertise in the electric power industry," acknowledged Stephen Casey, Member Services manager at co-host Holy Cross Energy.

Aspen Utilities Energy Efficiency manager Jeff Rice agreed. "The RMUEE always has a good program, but I'm particularly excited about this year's agenda," he said. City of Aspen Utilities is once again sharing hosting duties with Holy Cross Energy.

NEWCOMER, RETURNING KEYNOTES

This is Gabriel's first time at the RMUEE, but he brings with him more than two decades of leadership in the electric utility industry that include utility management, consulting, speaking, and writing on the industry.

Gabriel's award-winning 2009 book, *Visions for a Sustainable Energy Future*, offered specific steps that a progressive U.S. power industry could take to meet the nation's electricity needs in an environmentally responsible way. "Customer programs for energy efficiency and conservation are going to play an important role in that effort," he said. "Regional conferences like this give program managers who have a lot in common the opportunity to share their experiences so they can build on their successes and avoid repeating mistakes."

Attendees have plenty to share after seven years, noted Jeff Ackermann, a veteran of the RMUEE as well as the Colorado energy industry. "We've done a good job of establishing strong utility and local government programs in the state and putting innovative financial tools in place," he said. "Colorado is now poised to move to the next level of energy efficiency in the built environment."

Ackermann's first-hand knowledge of those programs and tools comes from his role as director at the CEO, and as head of research with the Colorado Public Utilities Commission (CPUC). Prior to his time with the CPUC, Ackermann was manager of the state's low-income demand-side management (DSM) programs, as part of the staff of the (then) Governor's Energy Office. He has provided leadership in this area twice in his career, from 2004-2007 and 1984-1995 (in the Department of Local Affairs), playing an integral role in negotiating a state-utility partnership with Public Service Company of Colorado (PSCo). Those efforts yielded the Energy Saving Partners Program, which has been serving low-income households since 1993.

"The time has come," Ackerman stated, "to expand such partnerships and assess the gaps in our programs. We need to better focus our resources to bring energy efficiency to areas and customer classes that are currently underserved," he said. "That's the message I'm bringing to the Utility Exchange this year."

A LITTLE CHANGE-UP

Attendees will have more time for networking and renewing contacts because the RMUEE starts in the morning this year, instead of the afternoon as it has in the past. Roundtable discussions will begin at 8:30 a.m. on topics the agenda committee will determine in advance from registrants' surveys.



Western Administrator Mark Gabriel (top) and Colorado Energy Office Director Jeff Ackerman are the keynote speakers at this year's RMUEE. (Ackerman photo by Colorado Energy Office.)

Following lunch and Ackerman's presentation, Wednesday's general session will focus on a subject that never ceases to challenge program managers: customer engagement. Speakers from local organizations like Fort Collins Utilities, City and County of Denver and Eagle County will share the microphone with representatives from the Shelton Group and National Rural

See ADMINISTRATOR KEYNOTES, page 8

AWEA LAUNCHES STATE WIND FORUMS IN DENVER

Conferences are a great way to learn a lot in a very short time, and to meet people who can serve as a resource long after the event is over. It's even better if the issues you study are specific to your territory, and the people you meet live close enough to collaborate. That's the idea behind the State Wind Energy Forum the American Wind Energy Association (AWEA) is holding in Denver, Colo., Oct. 8.

Stakeholders will join policy, industry and government leaders at the University of Denver to discuss the specific concerns, challenges and benefits of developing wind in Colorado. The single-day format offers a concentrated exploration of the state industry's current landscape, including recent changes to the state's renewable energy standard.

The state-level wind forum is a new addition to AWEA's catalog of events that annually assembles industry leaders and policy experts to network and expand business relationships. "The WINDPOWER exhibition and conference focuses on the national wind industry—the big picture—but every state has a unique situation" explained Larry Flowers, deputy director of distributed and community wind, and co-program chair of the Colorado forum. "The state forums are an opportunity to drill down and examine the issues local stakeholders deal with on a daily basis."

THE LINEUP

The conference agenda is designed to appeal to a broad array of wind stakeholders. The roster of sessions will include something for everyone, from landowners and agricultural producers to manufacturers and developers to policy makers and regulatory personnel.



Presentations will provide the Colorado perspective on marketing, rural economic benefits, integration, environment and utility concerns. Former Colorado Governor Bill Ritter, a strong advocate for renewable energy in the state, and John Stulp, Special Policy Advisor on water, will be on hand to guide panel discussions. "AWEA events are always very well organized and packed with useful information," said Randy Manion, Western's Renewable Energy Program manager.

Attendees won't be spending all their time sitting and listening to speakers—they will be engaging the experts in discussion, too. The "Networking Lunch with the Experts" is sure to be a highlight of the day. A subject matter expert will be at each table to lead a conversation on one of the many dimensions of wind power. The format allows for in-depth, question-and-answer sessions, as well.

The afternoon includes another networking break and the forum wraps up with an evening reception. Plan to make a day of it, and come back with many new contacts and ideas.

THROUGH A LOCAL LENS

AWEA selected Colorado as the location of its inaugural state forum because of the state's leadership in wind energy—it ranks 10th in the nation for total installed wind capacity, with more than 2,300 megawatts. "A great deal is happening in

Colorado's wind industry now, and the state forum will provide a one-of-a-kind perspective on that activity," said Flowers.

"Western has always encouraged its preference customers to attend AWEA events," added Manion. "The forum here in Colorado is a perfect opportunity for them to engage with local as well as national players in the wind industry. Utilities need to make sure their voices are part of the discussion—it will make for a stronger program and a stronger industry."

AWEA is planning a second state forum in Lansing, Mich., on Nov. 4. As Governor Rick Snyder works on a new state energy plan, the Michigan forum serves as a reminder of wind power's role in the state and of the potential benefits clean energy development has to offer. Like the Colorado event, the forum will give stakeholders a chance to explore the industry's strengths and address the challenges it faces on home turf. ⚡

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



QUESTION:

Dryer exhaust from a commercial laundromat measures at 150-170 degrees Fahrenheit. How can we recover this waste heat?

ANSWER:

Unfortunately, dryers are quite inefficient in their use of applied energy, but the good news is they offer excellent potential for heat recovery. When a dryer exhausts hot air, it is also receiving a supply of fresh air; so the most logical way to recover some of this heat is to recycle it to preheat the incoming air.

At first glance, recirculating the exhaust air back through the dryer may seem like the simplest solution. Although this does, indeed, “recover” nearly all the heat, it has the inherent disadvantage of also recirculating all the moisture. The best fuel savings claim from systems that use this strategy is about 10 percent, but drying time is actually increased because some of the moisture from the exhaust is also returned to the dryer. In fact, some of these approaches actually end up using more energy, so do your research carefully if you choose this route.

A more innovative and effective solution is to recover the heat with an air-to-air heat exchanger that removes heat from the exhaust air and uses it to preheat the incoming supply air. The Rototherm Corporation claims fuel reductions of more than 40 percent for their heat recovery wheel.



PUBLICATIONS, OTHER RESOURCES

For general technical information on heat recovery devices, including heat wheels, see:

- The *Energy Management Handbook* contains a chapter on waste-heat recovery you might find valuable.
- *Energy Savings Potential and RD&D Opportunities for Commercial Building Appliances* is a 2009 report from the Department of Energy’s Office of Energy Efficiency and Renewable Energy. This study examines energy use by commercial dryers, and among multiple energy saving technologies, exhaust heat recovery. The conclusion about the Rototherm heat recovery wheel technology is that it should be classified as a “working prototype.”
- Chapter 8 of *Evaluation of Waste Heat Recovery and Utilization from Residential Appliances and Fixtures* describes the performance of a heat exchanger installed into the dryer exhaust duct.
- The option of heat recovery is discussed in *Are We Missing Energy Savings in Clothes Dryers?* from the 2010 American Council for an Energy-Efficient Economy Summer Study on Energy Efficiency in Buildings.
- *Heat Extractor* reports on research and tests done by Massachusetts Institute of Technology students, working under the direction of a professor, of commercial dryer heat recovery systems. ⚡

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



WEBSITE OF THE MONTH:

NEW ENERGY SERVICES CALENDAR ALWAYS UP TO DATE

Finding events and training opportunities that help you with your resource planning and energy management challenges is now easier with Energy Services's new interactive event calendar.

Check the right column of the Energy Services home page, and you will see the Calendar Update section has changed. Instead of a static item announcing only one event, there is now a scrollable window listing several upcoming events. Click on an item of interest, and you will get a brief description of the event and a link to more information, including registration. Come back tomorrow and you will find new events—the calendar updates automatically with items we add as we find them. Or better yet, install the widget on your home page to share learning opportunities with your employees and key accounts.

KEEPING UP WITH THE TIMES

You may have noticed recently that the Energy Services Bulletin calendar has been replaced by a direct link to the Energy Experts Events Calendar. That's because in the instant information world of the Internet, it felt like a monthly calendar was always just a little behind. Especially with webinars, where participants don't have to travel to events, the announcements fall too easily into the cracks between publishing dates. Since one of our most important jobs is to connect our customers to educational opportunities, this state of affairs simply wouldn't do.

We turned for help to our partners at Washington State University's (WSU) Energy Experts—the people who design the handy calculators on our home page. You may already be familiar with their searchable calendar, which sorts entries by starting and

ending date, event name or location.

That last parameter will be useful to Western customers because the calendar features events nationwide, not just in Western's 15-state territory. "The 'widget' on the Energy Services website highlights events that will be of specific interest to our customers," explained Energy Services Manager Ron Horstman. "But good conferences happen all around the country, and investing in your staff's professional development can pay great dividends to your operation. We hope our website users visit the Energy Experts calendar to check out all the offerings."

PROMOTE YOUR EVENT

Another reason to pay a visit to the calendar is to enter your own event—that's right, anyone can post an energy-related event occurring in the United States. In fact, we would be delighted if our customers made this calendar their own by posting events they are sponsoring or just think are worthwhile for their colleagues and consumers to attend.

The only requirements for an event to be added to the calendar are:

- The events must directly relate to energy efficiency or renewable energy
- Details must be provided to allow a visitor to proceed with event registration

The easy-to-use online form indicates required fields with an asterisk. Don't forget to check the box next to "Western Area Power Administration" to make sure your event appears in the Energy Services widget.

You will be asked for contact information, which Energy Experts will use only to send you a confirmation message or ask for more details, if necessary. The staff at WSU will review

Calendar Updates

ENERGY SERVICES Western Area Power Administration

Best Practices in Utility Safety Programs
Las Vegas, NV - Starts: 8/26/2013

Using the Standard Work Specifications Online Tool
Online, WEB - Starts: 8/27/2013

The Power of Aggregated Purchasing: How to Green Your Electricity Supply & Save Money
online, WEB - Starts: 9/10/2013

E Source Forum, 26th Annual

The new Energy Services calendar widget updates automatically. You can install it on your own website, too.

your event, contact you if they have any further questions and post it, usually within two business days.

HELP US BUILD THE FUTURE

The changes to the Energy Events Calendar are part of a larger effort to make our website, especially the Energy Services Bulletin and Breaking News, more timely and useful. And for that, we need to hear from our customers.

What do you look for when you visit the Energy Services website? Is it easy to find? Occasionally, Energy Services sends email announcements to our bulletin subscribers. Do you receive too many announcements or too few? Tell us what you would like to see, and what kind of information would make your job easier.

And while we are on the subject of two-way communication, you might want to make sure the Energy Services Bulletin editor is on your press list. The best way to get your utility the recognition it deserves for its accomplishments, activities and events is to tell us about them yourself. ⚡

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

Electric Cooperative Association.

Thursday opens with dual session tracks in the morning, but attendees come together in the afternoon for another general session, this time on program integration. We'll explore different aspects of program management, including demographic analysis, measurement and evaluation, finance strategies and product vendor relationships. The afternoon will wrap up with a presentation on communitywide initiatives in Northern Colorado aimed at achieving widespread deployment of plug-in electric vehicles (EVs).

Attendees will get to do more than talk about EVs on Friday morning. The planned roundtable discussion on setting up an EV integration program at your utility includes the opportunity to test drive one. Western Energy Services Manager Ron Horstman is very enthusiastic about this session. "Electric vehicle technology has huge implications for the utility industry," he declared. "Our custom-

ers need all the information they can get about EVs to figure out how to integrate this new load."

Efficiency finance strategies, marketing efficiency programs and the ever-popular (and perplexing) contractor workforce development are among other proposed topics for the informal sessions.

For the first time this year, attendees can also arrange to visit Aspen Utilities and other local energy program offices and facilities. Don't miss this chance to meet the people who make the energy savings happen and see the nuts and bolts behind the success stories.

BACK BY POPULAR DEMAND

Of course, when something works as well as the RMUEE, you don't want to mess with the formula too much. Along with the new twists, there will be plenty of familiar features.

On Thursday morning, choose your track—commercial or residential—to dig into the nuts

and bolts of program management with a smaller group of like-minded professionals. The poster session is back too, and the lineup promises plenty of fodder for lively discussion.

A little incentive for newcomers has also proven successful in the past. Energy Services is once again offering \$100 scholarships to first-time attendees from Western customer utilities. Contact Ron Horstman at 720-962-7419 for more information.

Attendees come to Aspen Meadows Resort expecting great talk over great food and they won't be disappointed with the breaks, meals and receptions. Networking is, after all, a big part of why we attend the RMUEE, why we keep coming back and why the conference keeps attracting newcomers. "This is a great chance for me to meet several Western customers at once and to learn about their operations and concerns firsthand," said Gabriel. "I'm really looking forward to the conference." ⚡

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