



Great River Energy helps to launch community storage initiative

While the introduction of the Tesla Power Wall was creating a stir in the electricity industry, Great River Energy and several partners were quietly working to show utilities that they already have storage capacity that most haven't begun to tap.

The Minnesota generation and transmission cooperative had teamed up with the National Rural Electric Cooperative Association (NRECA), Peak Load Management Association (PLMA) and the Natural Resource Defense Council (NRDC) to reveal the "hidden battery in the basement."

"That is what the electric water heater is," declared Great River Member Services Director Gary Connett.

'Battery' almost banned

With three decades of experience in load shaping with electric water heaters and more than 100,000 units currently under the utility's control, Connett knows whereof he speaks. That extensive history with demand response is what led Great River to initiate the study on the storage potential of the common household appliance.

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Artwork courtesy of Peak Load Management Association

When the Department of Energy was revamping its efficiency standards, Congress was set to ban electric resistance water heaters with a storage capacity of more than 55 gallons. Great River worked tirelessly to overturn the ban, and the Energy Efficiency Improvement Act of 2015 ultimately included an exception for large water heaters.

“But that experience made us realize that we had work to do to make utilities understand how important this appliance is to their load management strategies,” recalled Connett. “It is even more so, now that we are being asked to integrate more variable resources into the power mix.”

Showing how it’s done

The long fight to save large water heaters also attracted the attention of the NRDC, an unlikely ally, Connett acknowledges. However, the utility and the environmentalists found common ground in the innovative use of water heaters to “store” renewable energy. The NRDC joined Great River, NRECA and PLMA to commission a study by the Brattle Group economic consultants.

The six-month study evaluated several strategies familiar to Great River, using two types of water heaters—electric resistance and heat pump units—both of which the utility has on control programs. The electric thermal storage strategy involves heating water at night when electricity is cheaper. “And becoming greener over time,” added Connett. “As Minnesota moves closer to its 2025 goal of 25 percent renewables the percentage of green energy in the night time hours only increases.”

Peak shaving is another strategy, which curtails load during times of high demand on a limited number of days per year, usually in four- to eight-hour cycles. Great River has about 45,000 water heaters on its peak shaving program and 66,000 on the thermal storage program. “That’s 20 percent of all the water heaters on our system. How many utilities can say that?” Connett asked.

The study also looked at fast response, a way to provide balancing services in the form of quick load increases and decreases. “This strategy will be tremendously useful as utilities

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bring more variable generation onto their systems," said Connett.

Proven right

The Hidden Battery: Opportunities in Electric Water Heating, (pdf) the report resulting from the study, reinforced what Great River had already learned from years of water heater control. Depending on market conditions, the Brattle research shows that storage-enabled water heating could save the consumer as much as \$200 annually. Based on that figure, payback for the appliance, associated control equipment and installation is five years.

The environmental benefits are significant too, as policy—and consumers—increasingly focus on clean energy and energy efficiency. Controlling water heaters not only saves homeowners money, but it reduces carbon dioxide emissions with the right power mix. As Connett noted, being able to shift electricity use to lower-cost generation in off-peak hours can increase the use of renewable resources like wind.

These findings were not so much a revelation as confirmation for Connett.

"That validation was pretty exciting," he admitted. "And now that storage is becoming more important to integrate variable generation, we will continue to move forward with our proven programs."

Initiative to spread word

Shortly after the release of the report this January, the partnership behind it launched the National Community Storage Initiative to focus attention on opportunities to develop national, regional and local markets for electric storage technologies. American Public Power Association and Edison Electric Institute have added their endorsement to the initiative, too.

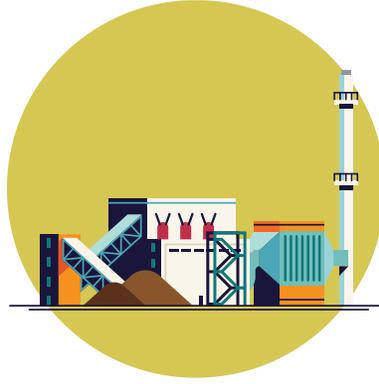
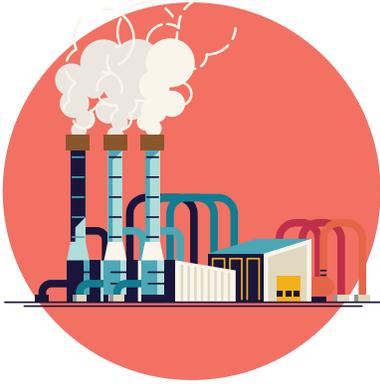
Similar to community solar projects, such programs would aggregate controlled residential appliances to build local energy-storage capability. In addition to giving utilities better control of their loads, these fleets could also potentially provide ancillary services. Connett noted that the new generation of "grid interactive water heaters" can be controlled over very short time intervals with nearly instantaneous response. "The market

is driving manufacturers to develop smarter water heaters," he said. "Utilities want more dynamic control, and manufactures are enabling that with Wi-Fi and global technology."

Water heaters are not the only existing appliances that offer energy storage potential. Great River Energy also controls about 167,000 air conditioners and has 15,000 ceramic-block, electric thermal storage heaters on its system that could contribute storage capacity. "But the beauty of the water heater is that it is a year-round load," Connett observed.

More smart appliances are in the pipeline, such as electric vehicles and the Power Wall. "There are plenty of opportunities coming up, but we don't need to wait for new technology," Connett said. "The water heater is here now, and this type of program is made for co-ops—it is collaborative, economical and innovative. It helps everyone on the system."

Find out how your utility can get involved in the National Community Storage Initiative. And don't forget to share your program with *Energy Services Bulletin*. ■



Geothermal Summit examines future of baseload renewable technologies

June 7-8
Reno, Nevada

Geothermal Energy Association's (GEA) fifth annual summit, June 7-8 at the Grand Sierra Resort and Casino in Reno, Nevada, has a broader focus this year. The future prospects of geothermal, biomass and hydropower technologies will take center stage at the first Baseload Renewable Energy Summit



The National Hydropower Association (NHA) and the Biomass Power Association (BPA) are teaming up with GEA to kick-start a conversation about the importance of baseload renewable technologies in a more diverse, less carbon-intensive energy supply. Geothermal, biomass and hydropower resources combined represent nearly two-thirds of US renewable generation today, yet they are frequently overlooked and undervalued in media discussions about renewable energy. All three industries face barriers at the political, financial and societal levels. The summit will focus on discussing the values, prospects and problems facing these technologies with an emphasis on highlighting potential solutions.

The agenda brings together experts from each industry, as well as utility, research and regulatory professionals and regional and federal officials. Panel

discussions cover the role of baseload renewables in reducing carbon emissions, meeting clean energy goals and balancing the grid; market issues; new technology and hybrid project opportunities and policy challenges.

The Baseload Renewable Energy Summit offers utilities an excellent opportunity to make their voices heard to industries that can help them deliver a balanced portfolio and a cleaner energy future. Register before May 6 to receive the early-bird discount. Members of GEA, NHA, BPA, Geothermal Resources Council and American Council on Renewable Energy receive an additional discount.

Sponsorships and tabling opportunities are also available for the entire summit as well as networking events. Contact Rani Chatrath at 202-454-5261 for more information. ■

IREC publication explores renewables options for low-, moderate-income consumers

“Shared” and “community” solar programs are making renewable energy a more affordable option for Americans, but spreading those benefits to low and moderate income (LMI) households still poses a challenge for utilities. *Shared Renewable Energy for Low- to Moderate-Income Consumers: Policy Guidelines and Model Provisions*, a new publication from the Interstate Renewable Energy Council (IREC), offers comprehensive guidelines on how to do it with the most meaningful results.

The publication offers information and tools for adopting and implementing shared renewables programs that benefit LMI individuals and households. Utilities, shared renewable energy developers, program administrators and others will gain insight into the unique challenges LMI consumers face to enjoying the benefits of shared renewables programs. Specific case studies examine lessons learned and highlight innovative tools and approaches. Stakeholders will find model rules to provide a strong starting point for discussion and potential implementation.

Low- to moderate-income households (those earning up to 120 percent of Area Median Income) represent approximately 60 percent of U.S. households. These consumers typically spend more of their income on energy costs than higher-income households, so they are in the greatest need of help

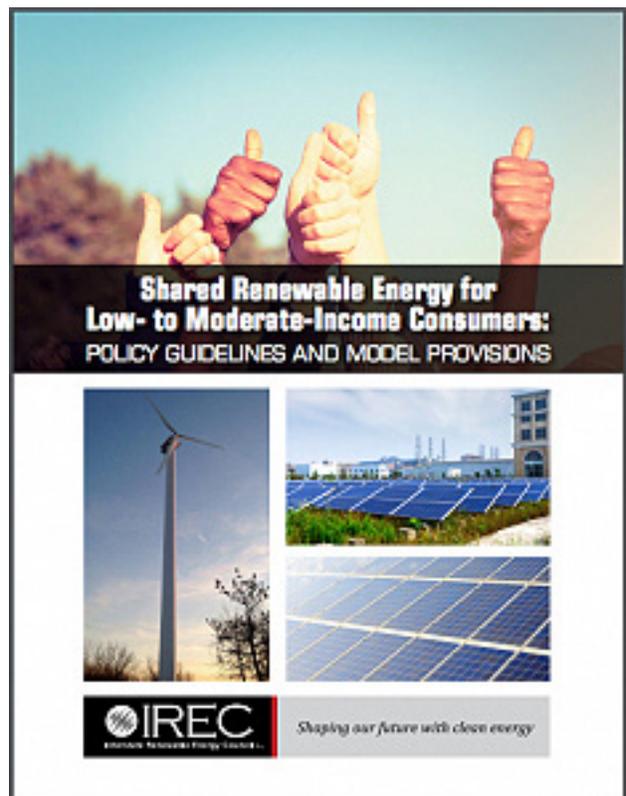
with reducing their energy bills. Unfortunately, the people in these households often face considerable financial barriers to participating in programs that could help them. Problems like lack of access to capital or insufficient credit can prevent them from benefiting from conservation, energy-efficiency and renewable energy measures such as shared renewable projects.

These first-of-their-kind policy guidelines also consider that moderate-income customers may have different circumstances (such as higher credit scores or higher rates of ownership) than low-income customers. Instead of designing programs that approach all LMI customers as a group, programs that address the range of

customers within the LMI category may be a more effective way to reach them.

The publication acknowledges that some barriers are due to policies unrelated to program design. IREC advises policymakers and others to be aware of these restrictions and take them into account when designing programs.

IREC has also produced a four-page quick reference guide to the full LMI report. The guide provides a summary of the key components of the guidelines and model provisions, along with references to the relevant sections in the main report. ■



New Better Buildings toolkit dives into training techniques

Utilities often struggle to educate contractors, staff and volunteers on building science; sales and marketing; program offerings and business development. To help residential energy-efficiency program managers plan technical, outreach and professional training, the Department of Energy Better Buildings Residential Network recently launched a Training Toolkit.

This toolkit—the fourth Residential Network Voluntary Member Initiative—includes tips, resources and examples to help you realize the value of providing training opportunities for contractors, staff and volunteers. A study of more than 140 energy-efficiency programs across the country found that contractor training activities led to more comprehensive upgrades, a higher assessment-to-upgrade conversion rate, improved program processes, improved quality control and increased revenues, among other benefits.

To achieve such results, program staff, volunteers and contractors must have a thorough understanding of building science; sales and marketing; residential energy efficiency program offerings and business development. In the Training Toolkit, program managers will discover training resources and opportunities, compiled and reviewed by Better Buildings Residential Network members, to build that expertise in-house.



Eden Housing affordable housing developer in Alameda County, California, has partnered with the Better Building Initiative to reduce the energy intensity of its properties by 20 percent. Reduced energy intensity results in lower utility bills for tenants and building owners. (Photo by Eden Housing)

The toolkit provides resources on three types of training:

1. Technical training – Covering building science, energy assessments, technologies and techniques
2. Outreach training – Covering promotion of program offerings, sales training and customer engagement
3. Professional training – Covering business development and management for participating contractors

Additional resources at the end of the toolkit include more details on the Better Buildings Residential Program Solution Center. This online collection of resources and lessons learned concerning training and other topics is based on years of on-the-job experience in residential energy-efficiency programs.

Get involved

The Better Buildings Residential Network connects energy-efficiency programs and partners to share best practices and learn from one another to increase the number of energy-efficient homes. Several Western customers, including the cities of Fort Collins, Colorado, and Palo Alto, California, participate in the initiative.

Members of the Residential Network join with other energy-efficiency programs and partners to identify and address common challenges and market opportunities through voluntary initiatives that result in the development of new tools and resources. Your feedback concerning this toolkit and your training efforts help the network improve its resources and identify new issues.

Contact the Residential Network for more information about joining or participating in the next voluntary initiative. ■

Western needs customer help to update website

Communication with customers is the key to productive business relationships, and the Energy Services website is how we maintain that dialogue. So we are excited to be a part of the project to redesign Western's agency-wide website, because it gives us the opportunity to ask you what kind of changes you would like to see.

To ensure that the new design meets your needs, we are asking you, our customers, to weigh in with your ideas and experiences. When you visit any page on the Energy Services website, you will notice a line at the top of the page, "Help us re-design this page. Click here to assist." Follow that link to complete a short questionnaire about your use of the website.

Energy Services visitors can help

out by paying particular attention to question 7. This is where you can offer specific suggestions about the website. Don't pull any punches—let us know what works for you, what doesn't, what you would like to see more of and what leaves you scratching your head.

If you really want to make a difference in the direction of the website redesign, fill out the form on question 8. We will contact you to schedule a

short user testing session, where we share our screen with you. You will be asked to locate content within the site, talk about your experience navigating through it and offer suggestions on improving your experience. The whole process should take about 30 minutes or less, and you would be making a great contribution to Energy Services and your fellow customers. You may also contact the Energy Service Bulletin editor if you are interested in participating in user testing.

Maintaining a website for a rapidly changing and highly technical industry like the utility industry requires constant vigilance and ongoing communication. We appreciate your input on our website content, now and in the future. ■

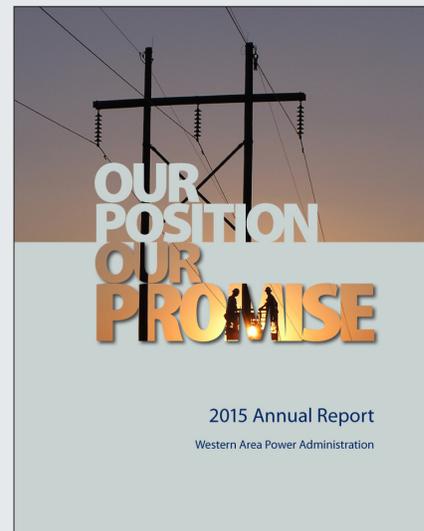
Western outlines position, promise in FY 2015 Annual Report

Industry changes require new way of thinking, planning, operating

Western Area Power Administration published its Fiscal Year 2015 Annual Report today. Our Position, Our Promise provides both Western's and the hydropower-generating agencies' combined financial statements and also illustrates how the organization's achievements during FY 2015 support its ability to continue delivering its mission.

"Providing clean, renewable, reliable and affordable hydropower, transmission and related services is our mission; it is our promise to customers," said Western Administrator

and CEO Mark A. Gabriel. "As our position evolves to meet the changing industry around us, we remain true to our promises." ■





Summit... with a *twist*.

The Geothermal Energy Association (GEA), National Hydropower Association (NHA), and Biomass Power Association (BPA) are joining forces to create a new spin to GEA's annual Summit.

This year's Baseload Renewable Energy Summit will feature the combined voices of three major baseload renewables.

Geothermal, hydropower, and biomass often face similar problems at the political, financial and societal levels. The Summit will focus on voicing key issues faced by the geothermal industry to both state and federal policy makers.

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