



University of Utah among green power competitors in EPA challenge

Photo courtesy of University of Utah

When it comes to sustainability, colleges and universities have some of the most aggressive and comprehensive plans in the nation, and WAPA is proud to count some of those institutions as customers.

One of our customers, the University of Utah, is putting its climate action plan to the test in the 2016-17 College and University Green Power Challenge, which encourages higher education institutions to increase their use of green power.[gpchallenge](http://greenpower.gpchallenge)

Throughout the academic year, the Green Power Partnership tracks the collegiate athletic conferences with the highest combined green power usage in the nation. The challenge, an initiative of the Environmental Protection Agency, is open to any conference in the

United States. Currently, 89 schools from 34 athletic conferences are participating in the 2016-17 Challenge. The PAC 12 conference, of which UU is a part, has used 79,173,575 kilowatt-hours (kWh) of green power so far this year.

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Drawing up plan

The University of Utah has been pursuing carbon neutrality since 2007 when the university president signed on to the American College and University Presidents' Climate Commitment. In 2010, the school set its official goal of reaching carbon neutrality by 2050 as part of its first Climate Action Plan.

The comprehensive plan created the university Sustainability Office and sustainability committees to coordinate education, research and initiatives to reduce the university's carbon emissions. The carbon commitment works hand in hand with a resilience commitment to strengthen UU's ability to survive disruption and adapt to change. These commitments combine to form the whole of the plan's climate commitment.

To meet its stated goals, the plan sets forth structures for guidance and implementation, and decision-making criteria for carbon reduction measures prioritized in an inverted pyramid. Avoiding and reducing emissions top the pyramid as the actions likely to have the greatest effect. Efficiency, resource replacement and offsetting fossil fuel use follow in that order. Every five years, UU will review, revise and resubmit the plan, a process that is currently underway.

Getting started

The first step on the road to carbon neutrality was gathering data on all wholly owned buildings and land area of the university and its subsidiaries. Leased facilities were not included in the accounting.

The difficulty for UU was that metering was only available at campus level when the initiative launched. "We have been working to get building-level information to better understand where we should focus our efforts," said Myron Willson, the university's deputy chief sustainability officer.

Data collection has led to an increased emphasis on commissioning



The University of Utah's U Drive Electric program has facilitated the sale of 92 electric and plug-in-hybrid cars since the beginning of the school year. With almost 50 percent of Utah's urban air pollution coming from tailpipe emissions, electric vehicles represent an important tool for improving air quality in Salt Lake City. (Photo by Sustainable Utah, Green News at the University of Utah)

and re-commissioning buildings and on major building system retrofits. The Sustainability Office is now looking into district-level energy planning on its health sciences campus.

In 2008, the students unanimously voted for a \$2.50-per-semester student fee, the Sustainable Campus Initiative Fund, to support sustainability projects. Since then, SCIF has received proposals ranging in focus from food systems to solar energy, and has allocated more than \$400,000 in grants to more than 100 projects. There is now support for turning the fund into a revolving loan program that could help to provide the initial capital needed for energy-efficiency and renewable energy projects.

Power supply plays its part

Although the plan prioritizes avoiding emissions and improving campus efficiency over using green power and offsetting fossil fuel use with renewable energy purchases, those strategies still have a place. UU installed a combined heat and

power plant in 2008 that provides 6 megawatts (MW) of power. There is also about 1.5 MW of distributed solar directly on campus, and another 2 MW under contract for three projects on the university's Research Park.

The university's latest project brings together the entire community of students, faculty, staff, alumni, neighbors and friends for a community solar energy installation program. U Community Solar offers members the opportunity to purchase rooftop solar panels and installation for their homes at 20 to 25 percent below market rate. In return for the significant discount, participants can voluntarily donate their renewable energy credits back to the university. "So far, more than 85 percent of participants have agreed to do so, generating almost 1.8 MW in the first round," said Willson. "The second round is nearing 1 MW of power. We register those RECs through WREGIS You are leaving WAPA.gov. [Western Renewable Energy Generation Information System]."

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Imperial Irrigation District built a new substation to accommodate the battery energy storage system near its El Centro gas generating plant. (Photo by Imperial Irrigation District)

Imperial Irrigation District brings 33-MW battery storage system online

California once again showed its leadership in integrating battery storage into the electricity grid last month, when Imperial Irrigation District (IID) commissioned one of the largest battery energy storage systems (BESS) in the North America.

Representatives from IID joined Coachella Energy Storage Partners (CESP), electric industry leaders and local and state officials, Oct. 26, to launch the 33-megawatt (MW), 20-megawatt-hour (MWh) system. IID installed the lithium-ion BESS to increase reliability while integrating renewable energy resources into the local grid. The storage system allows the utility to balance power, arrest frequency decay, provide spinning reserve, mitigate large fluctuations of energy, increase voltage stability and

deliver “black start” power restoration capabilities for the nearby El Centro gas generation plant. A black start is the process of restoring an electric power station or a part of an electric grid to operation without relying on the external transmission network.

Integration poses challenges

The dedication ceremony was the culmination of more than three years of assessment and planning.

Like many utilities, IID is feeling the pressure of increasing amounts

of renewables on its electric system. Those pressures are likely to grow as the state pushes toward its goal of a 50-percent renewable energy supply by 2030, especially since IID is located in such a resource-rich area. IID’s grid already carries 900 MW of clean energy—mostly geothermal and solar—with another 1,200 MW of new generation seeking to interconnect to its system.

“Specifically, the integration of solar generation was affecting our balancing authority, and our control performance standard began to suffer,” said Jesse Montaña, IID manager of planning and engineering.

Battery storage was a cost-effective solution to address ramp, regulation, capacity, ancillary services, system reliability and power quality. It is also

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environmentally friendly because smoothing the power supply and providing a spinning reserve are functions usually performed by expensive fossil fuel generation.

Putting pieces in place

After settling on the appropriate battery storage solution, IID issued a bond and drew on its capital spending budget to finance the \$38 million project.

CESP won the district's solicitation for 20 to 40 MW of grid-scale energy storage, beating out eight other vendors in the final round to serve as general contractor for the project. The company chose the energy project management company ZGlobal Inc. You are leaving WAPA.gov. to oversee construction and General Electric to build the system.

GE supplied a comprehensive package which includes the lithium-

ion battery with its inverters, plant controls, transformers and medium-voltage switchgear in a single enclosure. This is one of GE's largest energy storage projects to date and one of its few lithium-ion storage projects. The company recently rebooted its lithium-ion battery business and also won a contract in April for an 8-MWh battery energy storage system for Con Edison Development You are leaving WAPA.gov. in Central Valley, California.

Now playing

Construction took about one year to complete, demonstrating that a storage battery can be sited and deployed relatively easily. However, every system is different and poses its own challenges to integration. "The BESS replaces some of our need for spinning reserves, but it was continually reacting to mitigate the slow ramping capabilities of IID's generation

fleet," said Montañó. "We had to adjust reaction parameters on the BESS in order to economically and reliably balance the system."

Testing followed so that when the BESS came online in October, it was ready to provide benefits to IID and its customers. On top of the operational benefits of increasing reliability and bringing more flexibility to the utility's system, the BESS offers economic advantages, as well. It enables load shifting that reduces the need for expensive spinning reserves and is expected to result in significant cost savings to rate payers over the life of the project.

Every utility has a different power mix and different load, so battery storage must be evaluated on a case-by-case basis. But IID's project illustrates many of the technology's potential benefits and should give power providers elsewhere in the country much to think about. ■

Utah green power *from Page 2*

So far, so good

In addition to leading its conference in the Green Power Challenge, UU is making progress on its carbon neutrality goals. Its emissions have remained fairly constant since the baseline survey in 2007, but the university has experienced tremendous growth in that time frame. "Our per capita and per-square-foot energy use is down in our latest report, too," Willson added.

The university continues to move forward with aggressive building standards for new construction and for remodels that are 40 percent better than code and a solar-ready roof initiative. Demand-side incentives from Rocky Mountain Power You are leaving WAPA.gov., the university's utility, help support efficiency and clean energy projects. "We are able to roll the funds over into next project," explained

Willson. "We have also taken advantage of several Blue-Sky grants to install solar PV."

To tackle emissions from transportation, the U Drive Electric program offers U community members and Salt Lake City residents the opportunity to purchase or lease electric and plug-in hybrid vehicles at discounted prices. The collaboration between UU, Salt Lake City and Utah Clean Energy You are leaving WAPA.gov. has facilitated the sale of 92 electric and plug-in hybrid cars this year.

Willson acknowledged that the 5-year review will bring evolution to the plan. "It is hard to know in the first years what combination of steps will bring the best result," he said. "But we are currently working with consultants to evaluate several purchase power agreement opportunities for both on- and off-campus generation. This

has helped us look at reducing peak demand, opportunities for storage, such as thermal and battery, and how to plan for future campus growth."

WAPA wishes the University of Utah the best of luck in this year's Green Power Challenge. But as with most energy competitions, it is not whether you win or lose; it's how many opportunities for energy savings and load management you discover. In that, UU is already a winner.

If your college or university is interested in joining the 2016-17 Green Power Challenge, check out the steps to join Green Power Partnership for more information. To be listed, a conference must have at least two Green Power Partners and an aggregate green power purchase of at least 10 million kWh across the conference. Partner data deadlines are Jan. 4, 2017, and April 5, 2017. ■

ACEEE report offers strategies to improve small business efficiency programs

Webinar

Serving All Customers with Utility Energy Efficiency Programs

Dec. 6, 1 p.m. MT

Small businesses represent 90 percent of US businesses, consume about 20 percent of the energy and are of vital importance to our national economy, even more so in small towns and rural areas. Yet, utilities spend less than 4 percent of their energy-efficiency budget on these customers. ACEEEResearch

A new report from the American Council for an Energy Efficient Economy (ACEEE) looks at ways utilities can tap that potential for energy and demand savings in the small business sector. *Big Opportunities for Small Business: Successful Practices of Utility Small Commercial Energy Efficiency Programs* identifies successful practices and emerging approaches for reaching those notoriously hard-to-access customers. The report then covers the major structural and organizational barriers that continue to stand in the way of fulfilling the energy needs of small businesses.

Diversity creates challenges

Those barriers include lack of staff, time and money, and the fact that



many small businesses rent or lease, rather than own, their buildings. Customers across all sectors are often unaware of utility program offerings and the benefits of energy efficiency in general, and small business owners are no different in this respect.

But even addressing these challenges may not be enough to persuade small business customers to make upgrades that capture deep savings. Utility program managers, as well, may lack the resources to design, promote and provide programs that garner broad participation. The diversity of the small business sector, in terms of industry, energy uses, savings opportunities, financial needs, languages spoken, building types and cultures have important implications for program design.

Don't stop at lighting

Facing such a broad range of needs, many utilities take a "one-size-fits-all" approach, focusing on the low hanging fruit of lighting upgrades. ACEEE research showed that even among several well-established programs, 90 percent of electric savings come from lighting—and not without good reason.

Almost every type of small, non-residential utility customer sees a quick payback and cost-effective savings from installing such measures as linear fluorescent and LED lamps, fixtures and controls. Adding direct—or even free—installation of qualified measures and high rebates make participation easier, and business owners start saving money right away.

Yet, utilities miss many opportunities by not looking at a wider variety of energy end-uses. In small grocery

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Co-op uses drone for home energy audits

While regulators hammer out rules for utilities using aerial drones, some power providers have figured out how to put unmanned vehicles to use on the ground—or underground—for home energy inspections.

A recent article in *Electric Coop*, the weekly newsletter of the National Rural Electric Cooperative Association, highlighted a custom-made drone being used in Indiana to inspect members' crawl spaces.

Home inspectors know that doing an energy audit can be hard on the back and knees and sometimes involve close, personal contact with spiders, rodents, snakes or standing water. A co-op energy adviser at Hendricks Power in Avon, Indiana, realized that robot technology might be able to eliminate the worst of the job.

Steve Hite developed a drone that carries a digital camera and transmits real-time video and still images to a laptop screen. Inspection Bots, a Colorado-based vendor and customizer, built "Robbie" for the co-op in 2015, and it has been used in dozens of audits since then.

According to inspectors who have used Robbie, it is similar to operating a remote control car. The device enters the crawl space through the door and provides a thorough visual inspection while the energy advisor operates it from above. "The drone has two speeds and seems to move through crawlspace areas with ease," said Hite.

Homeowners can watch the inspection and discuss the findings with the auditor as it occurs. Hite said he sometimes allows the member to

take the controls, if they are interested (who wouldn't be?). Hendricks Power has also loaned the drone to other co-ops in the area to use in their home inspections.

Using robotic technology for overhead power line inspection will have to wait for the future, but with a little innovative thinking, drones can be improving efficiency, safety and customer service today.

Could a drone like Robbie help your utility conduct inspections in tight underground spots? Contact WAPA's Equipment Loan Manager and cast a vote to add it to the Equipment Loan Program. ■

Energy Advisor Steve Hite designed a home inspector that is immune to distractions like crawling creatures and water puddles. (Photo by Hendricks Power)



EERE Network News gets facelift, new delivery date

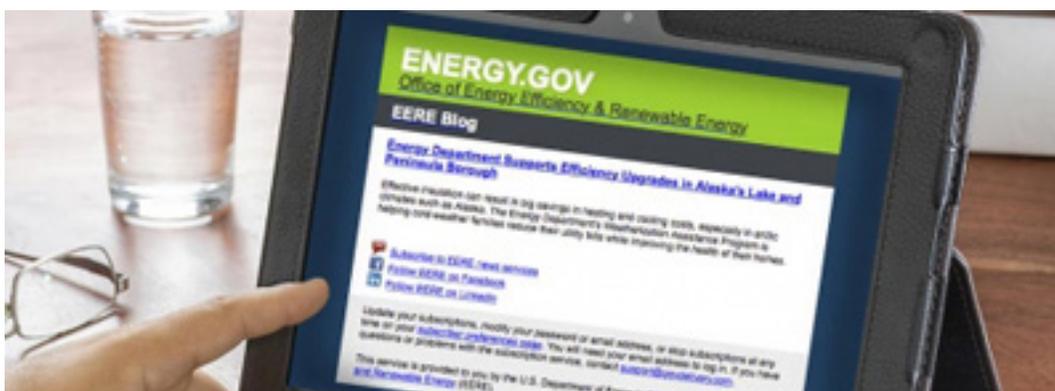
One of your best resources for the latest developments in clean energy and wise energy use (besides the *Energy Services Bulletin*, of course) is about to make some changes. Starting Nov. 10, the EERE Network News will become the *EERE Weekly Digest of Clean Energy News* and arrive in your inbox each Thursday.

There's more: The new weekly newsletter will spotlight some of the fresher content offered by EERE, including videos and blogs. Browse the video gallery for short features on topics ranging from efficiency programs to technology to competition to financing. The EERE blog covers current Office of Energy Efficiency and Renewable Energy projects, interviews with energy experts and success stories about EERE's technology offices and national laboratories.

If you don't already subscribe to the EERE newsletter, there is no time like the present to change that. Just a sample of what you missed in this week's issue includes stories on the 40th anniversary of the DOE National Weatherization Program and Zillow's partnership with the Sunshot Initiative.

You can also subscribe to newsletters that focus on specific technology programs. Key accounts managers may be interested in advanced manufacturing or building technology updates. The FEMP Digest offers valuable news for facilities managers, federal and otherwise. For resource planners, publications on wind, solar, geothermal, bioenergy and fuel cells highlight activities, projects, events and education and funding opportunities.

The changes in the electric utility industry are coming hard and fast and can sometimes seem overwhelming. The EERE newsletters make it a little easier for busy professionals to keep up with—and maybe even get ahead of—the next big issues. ■



stores, for example, refrigeration can represent as much as 57 percent of the total electricity consumption. Also, most small business programs are electric only, and don't provide any natural gas- and water-saving measures for space and water heating or cooking. Electric-only utilities might consider partnering with water and natural gas providers to create integrated efficiency programs.

Customize, partner

Report authors studied leading small business efficiency programs to find emerging trends that are delivering results today and point to a future for program designs and features. A more customized and customer-centric model is the key, according to the report. Recommendations include:

- Segment your market and design customized offerings for each sub-segment
- Provide personalized and relevant messages through targeted marketing and communications
- Offer zero- or low-interest financing to encourage comprehensive retrofits and deeper savings
- Offer a wide set of eligible measures, for multiple end-uses, based on target market research and data analytics
- Where possible, assign dedicated project managers to give customers direct technical assistance, education and support



Establish partnerships with the local Chamber of Commerce, small business advocacy organizations and community groups to gain access to more commercial customers and engage them as trusted local partners

Download the report to learn more, or register for *Serving All Customers with Utility Energy Efficiency Programs* on Dec. 6. This upcoming webinar looks at providing energy efficiency for hard-to-reach customer groups, including small businesses. ACEEE is partnering with Efficiency Cities

Network to present a series of webinars on cities and the transformation of the utility industry. Past topics include:

- Meeting Climate Goals with Energy Efficiency: Cities and the Clean Power Plan
- City and Utility Partnerships: Minneapolis Case Study
- Cities and the Transformation of the Utility Industry ■