

Energy Services **BULLETIN**

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

New SRP program to put solar on school, in classroom

Renewable energy systems and schools are both about preparing for the future, which is why forward-thinking utilities are creating programs like Salt River Project's (SRP) "Solar for Schools."

Launched early this year, Solar for Schools will fund the installation and maintenance of solar photovoltaic (PV) systems in selected schools throughout the state of Arizona. The chosen schools will receive:

- An installed conventional, fixed, flat-panel PV system that produces at least 10 kilowatts (kW)
- A 10-year maintenance contract for the PV system
- Educational materials and educator training related to solar energy
- A data acquisition system to allow students and staff to monitor system output

The program got its start as part of an agreement SRP made with the

Environmental Protection Agency. The agreement included a budget of \$2 million for Solar for Schools, \$750,000 in wood stove replacement and \$1.25 million to retrofit school buses with emission-control technology.

Not-for-profit, K-12 schools in SRP's service territory in Maricopa and Pinal counties are eligible to apply for Solar for Schools. Schools in two eastern Arizona school districts near the utility's Coronado Generating Station may also participate in the program. Title 1 schools—where more than half the students are on the state's free lunch program—will receive priority. "The goal is to put the arrays where they will do the most good," explained Lori Singleton, SRP's manager of sustainability initiatives and technologies.

SRP announced Solar for Schools with a press release and sent application packets to all of the 650 schools in its territory and near the Coronado Generating Station. "We were a little concerned initially that we might not get enough applicants," admitted Lori Singleton.



More than 100 schools applied to SRP's Solar for Schools program that will place a minimum 10-kW solar array on the school's roof, a data collection center at the school and new curriculum materials into teachers' lesson plans. (Photo by Salt River Project)

Applicants ready

The minimum criteria proved to be no barrier for the 125 schools that returned applications. "Now we are looking at different options for extending the program past the initial offering," said Singleton.

To be considered for the program, SRP requires schools to:

- Own the building on which the system will be installed
- Work with SRP and SRP contractors to get the PV system installed and operating by Dec. 31, 2010

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SRP program

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- Sign a standard solar power agreement and an interconnection agreement, if selected
- Accommodate a preliminary site survey by SRP's contractor
- Deliver an objective results summary report if selected

SRP will install and maintain the system on the building roof and install the data center in the school. The PV system will be net-metered, but a 10-kW system is not likely to generate excess electricity, even during school holidays. "This size of array provides more educational benefits than power," said Singleton. "If we continue this program, it would be great to put in systems that make more of a dent in the schools' electricity demands."

The future of Solar for Schools may be determined in part by what SRP learns from the objective results

summaries participating schools must submit. The report on areas of the program that went well and those that need improvement will provide lessons SRP could incorporate into another round of school projects. The interest is clearly there if the funding can be found, but first the selection process must determine whether or not the applicants are actually suitable solar sites.

Site inspections

The SRP selection team, made up of employees from various departments, is now evaluating applications to compile a list of schools that will derive the most benefits from the program. An independent survey is the next step for the schools that make the list. Singleton acknowledged that a building that sounds like a good candidate for a solar array on paper might not make the cut. "There are so many variables—the size and condition of the roof, the building's orientation and exposure," she said.

The selection process is expected to be completed by mid-August, and SRP hopes to begin construction on the first system by spring of 2010. The number of schools that ultimately receive solar systems depends on how far the funding will go.

For future consumers

Arizona schools, like so many others around the country, have been hard hit by the current economy,

noted Singleton. Well before the EPA deal, SRP was looking for a new idea that could offer some relief. Solar for Schools just helped to get the ball rolling on the latest of the utility's many outreach programs that target schools.

SRP's K-12 education program, "Powering Our Future," developed in partnership with the Arizona Foundation for Resource Education (AFRE), has trained more than 200 teachers over the past four years. That experience provided a framework for creating the Solar for Schools curriculum and teacher training for introducing energy science into the classroom.

The utility also offers electricity and safety classroom presentations, and funds grants for school projects. A Phoenix student used one such grant to build solar golf carts for the maintenance crew at his high school. "The student had to apply for the grant through the school, and then he went on to promote his project," Singleton recalled. "He has a great future in the utility industry."

That may not be a joke, as Singleton added that one SRP engineer became interested in solar power because of the utility's school programs. "Our goal is to educate the next generation of consumers," she acknowledged. ⚡

Energy Services Bulletin

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Visit www.wapa.gov/es/pubs/esb/2009/may/may091.htm

Catching up with energy-efficient cooling systems — Ice Bear

This is the second installment of a two-part update on energy-efficient cooling technologies covered in past issues of Energy Services Bulletin.

Peak load management is not a problem that lends itself to a silver bullet—it all depends on the climate, the customer, the building and the utility itself. Take the summer cooling season for example: utilities offer incentives for high-efficiency air conditioners, swamp coolers or heat pumps. Time-of-use (TOU) rates and automated load control have their place, too. Ice Energy's Ice Bear energy storage system, first covered in the April 2006 Energy Services Bulletin, represents a specific opportunity to reduce cooling demand, but one that could have a major impact in the right application.

Works with HVAC

The Ice Bear is a rooftop, thermal energy storage (TES) system ideally suited for installation on buildings of three stories or less. In other words, many, if not most retail, light commercial, industrial, office, educational and municipal buildings are good candidates for the technology. The configuration of off-the-shelf components works with existing HVAC equipment to shift a facility's peak electricity demand.

Using less expensive nighttime power, the Ice Bear system freezes water in an insulated tank to store cooling capacity for the next day. During the day, chilled refrigerant circulates through the tank to a modified evaporator coil in the air conditioning system, eliminating the need to run the energy-intensive compressor. The



The combination of a 1.2-MW solar system and six Ice Bear cooling systems reduces Napa Valley Community College's peak power consumption by more than 1.5 MW. (Photo by Ice Energy LLC)

ice refreezes each night while the HVAC system operates as usual.

According to the manufacturer, Ice Energy LLC, integrating the Ice Bear with a building's HVAC system can reduce daytime air conditioning energy demand by as much as 95 percent. Facility owners can take advantage of time-of-use rates offered by their utilities, and power providers can use the system as a load-shaping tool.

New partners

In 2008, Ice Energy introduced the second generation Ice Bear 30 and the complementary Ice-Ready Rooftop Units (RTU). The RTU expands applications for hybrid cooling with a dedicated evaporator coil and built-in connection to the Ice Bear. The components are designed to integrate into existing HVAC systems, and to be available to end-users as an out-of-the-box solution. Ice Energy

is working with HVAC leaders Trane Inc., Carrier, York and Lennox to market cooling units with the Ice Bear 30 already integrated.

The recent addition of smart grid-enabled "Cool Data Controller" software to its product line indicates another shift in Ice Energy's marketing strategy—to the supply side. In an interview with the Northern Colorado Business Daily, Ice Energy President Frank Ramirez envisioned utilities deploying the storage systems in the same way they deliver electricity. "The end consumer will be the beneficiary of the technology and the host of the technology," he explained, "But the utility companies will be Ice Energy's customers."

"A large-scale deployment of Ice Bear units could feasibly shift 40 to 60 percent of a utility's peak load," said Randy Zwetzig, the company's vice president. "It can be done relatively

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Western asks: How would you “Change the World”?

Spring is a time of inspiration and change, so what better time to think about—October. Specifically, we would like you to think about Energy Star’s 2009 “Change the World” campaign, and what we can all do to save energy and protect the environment.

On Earth Day, April 22, Western kicked off a contest to collect ideas to use for our own participation in “Change the World.” The goal is to come up with an innovative way for individuals to make a difference in the fight against global warming. Western will showcase the winning measure in our “Change the World” press releases, e-mail messages and Web pages throughout the month of October. All who participate will receive a nominal prize for sharing their ideas, and the most original idea will receive honorable mention. The winner will be awarded a custom plaque, plenty of recognition, and, of course, the chance to change the world.

Contest rules

The contest is open to the families of Western customers and employees. Entries are due by close of business June 20, 2009, and the winner and honorable mention will be contacted by July 20 and announced on the Energy Services home page.

Representatives from Energy Services and Western’s corporate communications department will evaluate the entries and select the winning measures. “Our judges have spent a lot of time talking to customers about what makes energy-efficiency programs work, and they understand the challenge of getting an idea across to diverse audiences,” explained Energy Services Manager Ron Horstman.

Judges will be looking for ideas that stress innovation and simplicity, he added. “People have to feel like their efforts matter,” noted Horstman, “but make a measure too complicated or expensive, and consumers quickly get frustrated and opt out.”

Entries will be evaluated on:

1. Meeting “Change the World” goals – Does the measure save energy or water, reduce carbon footprint, cut electric bills or raise awareness of wise resource use?
2. Creativity – Does it use resources, existing programs, typical behaviors or ordinary home or office equipment in a different or unique way?
3. Easy implementation – Is it something most people can do without much training or a big change in everyday behavior?
4. Participation – Can people put the idea into action on their own? Could the measure be turned into a program that involves neighborhoods or community groups, or even national or global groups?
5. Impact – Can the action be taken at home? School? Work? If widely adopted, how much difference could the measure make?
6. Cost – Does the measure require any special equipment? Can consumers find what they need at the grocery or hardware store? Does the measure only take the individual’s time?

The Change a Light, Change the World campaign was so successful, Horstman pointed out, because it fit so many of those criteria. “Replacing light bulbs is a relatively easy thing to do, and if consumers changed enough

of them, they started seeing small but noticeable results on their electric bills.”

Building momentum

“Change a Light, Change the World,” which ran from 2000-07, was all about taking those small individual steps to reduce global warming. Western actively participated in these campaigns, encouraging employees to pledge to replace a light bulb with a compact fluorescent light (CFL) or some other activity. Some employees have organized CFL giveaways in their own communities.

Launched in 2008, the “Change the World” campaign challenges Americans to take their energy-saving efforts farther. Energy Star gets the ball rolling with energy-saving tips posted on its Web site, and people are responding by sending Energy Star success stories from their homes, offices and communities.

Energy Services Bulletin highlights success stories too, but usually on a utility scale. This contest follows Energy Star’s lead by focusing on things we can do in our daily lives to make a difference. “We particularly want to encourage the youngest consumers to contribute their ideas,” said Horstman. “Kids often have the strongest commitment to the environment—and the most imagination. We are looking forward to seeing some real creativity.”

The contest entries become property of Western, and no good idea will be wasted. Conservation and energy-efficiency measures are just different ways to say demand-side management, after all. Every sugges-

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Ice Bear *from page 3*

quickly and inexpensively, making it an attractive alternative to building new peaker or mid-peaker powerplants.”

Industry recognition

Ice Bear is steadily building its profile within the HVAC industry. At its 2009 conference, the American Society of Heating, Refrigeration and Air Conditioning Engineers gave Ice Energy the AHR Expo Green Building Innovation Award for developing the Ice Bear 30.

That award coincided with another honor, the Ice Bear receiving 90 out of 100 points on Smart Grid News’ Smart Grid Scorecard. The scorecard rates technologies for engineering that meets smart grid implementation standards.

Buildings Magazine named the Ice Bear one of its Top 100 Products of 2008, and California Energy Commission gave Ice Energy and the City of Victorville a Flex Your Power Demand Response Award. More importantly, CEC is making the technology part of its permanent load shifting effort.

California shifts peak

That inclusion is due, at least in part, to the support the Ice Bear garnered during Southern California Public Power Authority’s 11-member demonstration program in 2006.

Anaheim Public Utilities, one of the participants, now offers rebates to customers for deploying small-scale thermal energy storage. To date, seven customers at eight sites have installed 28 Ice Bears, permanently shifting a total of 259 kW of load to the off peak hours. Qualified customers also receive a special rate, providing further incentives in the form of lower energy bills.

Time-of-use rates are where the Ice Bear really pays owners back, notes Paul Reid, public benefits manager for Azusa Light and Water. Azusa participated in the SCPPA demonstration, but does not offer incentives for the Ice Bear, even though the unit on the city library “runs like a champ,” after an early glitch. “Our TOU rates apply only to customers with a demand of 200 kW or more—about two dozen, in all,” Reid explained. “We are too small to design rates for special customer categories.”

At the other end of the size spectrum, investor-owned Pacific Gas & Electric (PG&E) and Southern California Edison (SCE) see mass deployment as a way to reduce their peaks by megawatts. As part of PG&E’s “Shift and Save” program, Ice Energy and Trane are retrofitting commercial buildings in PG&E territory with advanced cooling systems. The investor-owned utility’s goal is to reduce peak demand by up to 1.2 MW. SCE’s version of “Shift and Save”

is aiming for 2.5 MW of power relief by installing Ice Bears on 300 mid-sized customers. Ice Energy is teaming with Honeywell Utility Solutions in SCE’s territory.

Participating PG&E and SCE customers will receive rebates to offset the installation costs, and they may save as much as 20 percent on their electricity bills. Some funding for “Shift and Save” is coming from CEC.

Going forward, Zwetzgig believes the stimulus bill could benefit Ice Bear installation projects, not only for individual customers, but on the scale of the “Shift and Save” program as well. “The Cool Data Controller can aggregate and dispatch units, so utilities can shift a large part of their load to a time when the grid is both underused and more thermally efficient,” he noted. “In other words, they can change the way they use their systems for the better.”

It may not be a silver bullet, but the right-sized utility with a significant base of small-to-medium commercial and industrial customers could find a place on its list of cooling solutions for the Ice Bear. ⚡

Want to know more?

Visit www.wapa.gov/es/pubs/esb/2009/may/may092.htm



TOPICS from the POWER LINE

Web tools available to calculate energy savings

Editor's note: The Energy Services Bulletin features real answers to real questions posed to our staff at the Energy Services Power Line. We hope you find it useful.

Question:

Do you have information on calculating the energy savings for air conditioners with various SEER (seasonal energy-efficiency rate) values and capacities? We need to calculate the energy savings from our utility's energy-efficiency rebate program.

Answer:

First, it is important to understand that if you are currently providing a rebate for air conditioners with a SEER of 13, there will be no savings. Units with 13 SEER are the minimum efficiency units that can be legally manufactured in the United States.

Here are two different Web-based calculators you can use to estimate the savings from going to higher SEER units:

- The Air Conditioning Cost Calculator, developed by Energy Experts at Washington State University, estimates air conditioner energy use based on the SEER and the number of cooling hours per year. It also allows you to estimate the savings from sealing leaks in ductwork located outside the insulated shell of the building. On average, these ducts lose 20 percent of the heating and cooling energy that the homeowner pays for, and duct sealing can be very cost effective.
- The Home Energy Saver (HES) provides a comprehensive picture of residential energy use beyond just cooling. Lawrence Berkeley National Laboratory developed the calculator for the U.S. Department of Energy to help homeowners make decisions about improving the energy efficiency of their homes. The calculations are performed by DOE2.1 – a program that has been under continuous

development for more than 30 years. DOE2.1 is generally recognized as the most accurate and flexible program available for calculating energy use. The user provides some simple data on the home's location, insulation values and heating and cooling system efficiencies. HES then estimates the home's energy use based on the assumption of an older 1,800-sq.ft. house.

After the initial calculation, you can view the home's parameters, or change them by clicking on the link below the six boxes that give the energy consumption. If you choose to change them, you are given the option of changing insulation levels, heating system efficiency, fuel costs, etc.

Your customers may find the HES useful for other energy consumption calculations, too. Consumers as well as utilities can use the Web site for estimating the savings due to multiple energy-efficiency improvements in a residence. ⚡

Want to know more?

Visit www.wapa.gov/es/pubs/2009/may/may094.htm

DOE Energy Efficiency and Conservation Block Grant Program

More than \$2.6 billion in formula grants is available to help states, territories, local governments and Indian tribes fund energy-efficiency and conservation projects, and the deadline to apply is May 26 for states and June 25 for cities, counties and tribes. Such exciting news might send the many municipal utilities and tribes in Western's territory scurrying for applications—if they knew what a formula grant is or if their project is eligible. The place to get answers to these and other questions is the Energy Efficiency and Conservation Block Grants (EECBG) program Web site.

Allocating money

The EECBG program provides Federal grants to local agencies to reduce energy use and fossil fuel emissions, and to improve energy efficiency. The American Recovery and Reinvestment Act (ARRA) of 2009 funded the program for the first time this year in the following amounts:

- Nearly \$1.9 billion to cities and counties
- More than \$770 million to states, U.S. territories and the District of Columbia
- Nearly \$54 million to Indian tribes

To learn more about how the money will be distributed, visit the interactive map showing state and local allocations. Select a state to download an Xcel spreadsheet breaking down funding by city, county and state. A



U.S. Department of Energy
Energy Efficiency and Renewable Energy

Energy Efficiency & Conservation Block Grant program

Building Operator Certification will present a free webcast May 5 on EECBG funding opportunities. Learn about the grant application criteria, timing and process for approval, and the type of energy efficiency improvements that are eligible.

similar map shows tribal allocations by state.

Eligibility criteria, found on the home page, explains in detail how the program defines entities. The formulas are based on population, except for Indian tribes, which must be recognized as such by the Federal government to be considered for a grant.

Eligible projects

The type of projects that might receive funding run the gamut from innovative finance models to modernizing building codes to promote energy efficiency to capturing methane and greenhouse gases. DOE is encouraging grants for programs that create jobs in the short term, and lay the groundwork for long-term economic sustainability.

Recipients will be required to report their progress regularly to DOE. The criteria for measuring success include number of jobs created or retained, energy savings per dollar invested, renewable energy capacity installed, greenhouse gas emissions reduced and funds leveraged.

Application process

For Federal grants, the government requires applicants to complete a three-step registration process. The process takes about 21 days, so interested parties should begin immediately.

Users can download instructions to help them locate all the documents needed to apply for the EECBG program. The funding opportunity announcement (FOA) can be found at FedConnect, where visitors can view it without registering. However, only registered users can apply through the FOA, and registering with FedConnect is one of the government requirements for applying for the EECBG. The application package is available at Grants.gov, where it can be downloaded and saved to your computer without registering.

States will be awarding sub-grants from EECBG funds. To learn more about that process, visit the National Association of State Energy Officials. ⚡

Want to know more?

Visit www.wapa.gov/es/pubs/esb/2009/may/may095.htm

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tion has the potential to become a tool our customers can use to save energy and engage their consumers. “That includes the ‘Change the World’ contest itself,” added Horstman. “Utilities can adopt this model to collect ideas for their own programs.”

So get ready to tell Western how you would Change the World. Submit your idea for saving energy and fighting global warming by e-mail or send it snail mail to:

Western Area Power Administration
Attn: Change the World contest
P.O. Box 281213
Lakewood, CO 80228-8213

We accept electronic messages, letters, photos, audio, video or artwork—whatever format best expresses your idea—so feel free to use your imagination. Then watch the Energy Services Web site for more information. ⚡

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2009/may/may093.htm

Become the center of the “World”

Send Western your ideas for saving energy and protecting the planet.

The best idea will be used in our month-long “Change the World” campaign in October.

Log onto www.wapa.gov/es/changetheworld.htm



**HOW WOULD YOU
CHANGE THE WORLD?**

DOE EERE Industrial Technologies Program presents FREE webinars every Thursday, 1-2 p.m. EDT

This month's topics include:

May 7 - Combined Heat and Power: Is It Right For Your Facility?

May 14 - ESA and IAC Results: Most Commonly Identified Recommendations

May 21 - Insulation, the Forgotten Technology

May 28 - American Reinvestment and Recovery Act:
What does it Mean for ITP?



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