



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

Western customers help shave California's peak demand

According to a report by the California Municipal Utilities Association, public power utilities reduced the state's peak demand by more than 50 megawatts (MW) and spent more than \$54 million on energy-efficiency programs in FY05/06. Energy Efficiency in California's Public Power Sector predicts that by the end of FY06/07, those 39 utilities will save a combined 338 million kilowatt-hours (kWh).

The list of utilities in the report reads like Energy Services Bulletin's "greatest hits," since the newsletter has highlighted many of the programs and projects that contributed to those savings. Los Angeles Department of Water and Power and Sacramento Municipal Utility District, in particular, are "rock stars." The state's two largest public power utilities represented 63 percent of peak savings and 62 percent of annual savings from energy-efficiency programs.

In such stellar company, the efforts of smaller power providers sometimes

don't get the attention they deserve. But the report clearly shows that utilities of every size can find opportunities to save energy and reduce demand.

Package deal

Gridley, Healdsburg, Shasta Lake and Ukiah are primarily residential communities in Northern California. Ukiah's municipal utility, the largest, boasts about 7,500 meters, and each of the others serves less than 6,000 meters. With few employees and limited resources, the four utilities decided to team up to meet state energy-efficiency mandates. In 2006, the partners contracted with Efficiency Services Group (ESG), a consulting firm specializing in utility-run, energy-efficiency and renewables programs of the type funded by California's public benefits charge.

The utilities had all operated their own energy-efficiency programs in the past, but California recently increased the goals and reporting requirements for public benefits programs. "We needed a more comprehensive approach to managing the programs, but we just didn't have the staff to handle it," said Ukiah Electrical Distribution Engineer Liz Kirkley.

So instead of four utilities each hiring full-time, energy services employees, they "chipped in" on a consultant with the experience they needed. "It was a cost-effective way



Modesto Irrigation District's voluntary demand-response program, Shave the Energy Peak (STEP), has delivered significant load reductions for the irrigation district over nearly 25 years. (Artwork by Modesto Irrigation District)

to provide our customers with the most effective energy-saving measures, while meeting the new state reporting requirements," Kirkley said.

ESG created a package of incentive programs for the utilities based on programs that had been successful for other California power providers. "Then we added some custom features for their specific situations," said Jim Brands of ESG.

The utilities now offer a menu of residential audits and rebates for appliances, lighting, weatherization, geothermal heat pumps and air conditioning. Not included in the package but available as add-ons are a com-

See PEAK DEMAND page 2

What's inside

- New IRP rules 3**
- DSM technologies workshop 5**
- Topics from the Power Line..... 6**
- Web site of the Month 8**

Peak demand

from page 1

mercial lighting program and commercial and industrial (C&I) audits. ESG has also developed a solar power installation program in response to state legislation requiring all utilities to make them available to customers. "Our goal is to provide utilities with full-service, turn-key energy services programs," said Brands.

In the first two years the utilities offered the programs, the combined savings totaled 129 peak kilowatts (kW), 143 demand kW and 315,097 kWh annually. Not bad for little guys.

Demand response works

Modesto Irrigation District (MID) is almost 10 times the size of Ukiah but still small by California standards. The summer-peaking utility serves more than 114,000 customers, with C&I accounts representing about 55 percent of its energy sales.

In California's Central Valley, hot, dry summers and agricultural business drive the demand, and MID has a long, successful track record with demand response.

MID's voluntary "Shave the Energy Peak" (STEP) program, targeting

residential and small commercial business air conditioners, has been operating for so long, most employees don't remember exactly when it started. "STEP has been around nearly 25 years," said Energy Services Supervisor Bob Hondeville. "It's given us some hefty load reductions and prevented expensive power purchases."

The utility offers residential customers a \$5-per-month credit and commercial customers \$2-per-ton from May to December in return for fitting their air conditioners with a controller that allows MID to cycle the unit off and on during the hottest days. "About 13,000 residential customers participate in the program," said Public Affairs Specialist Kate Hora.

The program is promoted through direct mail and MID's monthly newsletter, which accompanies the electric bill. "We usually do a general announcement in March to give new customers a chance to sign up," Hora said. "We add about 500 customers to the program each year."

"A post card mailing goes to another group targeted for control unit replacement," adds Hora. This year MID should finish converting its oldest STEP control boxes from "ripple" power-line carrier communications to newer pager technology.

Industrial and larger commercial customers can opt into MID's interruptible demand reduction program. Customers can pre-select an amount of load they would be willing to curtail upon MID's request during the summer peak season. The customers receive a credit of \$3.62 per kilowatt if they curtail the agreed-upon load.

Hondeville said the irrigation district is also gearing up for the transition to automated meter infrastructure (AMI). "We are looking at a target of having AMI up and running around the end of 2008."

Industrial customers

Once completed, the AMI system will enable MID to expand rate options, automatically connect and disconnect residential and commercial services and perhaps even provide a new platform for load control.

All MID commercial accounts over 500 kW per month will soon be on a time-of-use (TOU) rate schedule. MID's industrial rates are mandatory time-of-use now, but much of its industrial load remains flat and very seasonal. "We serve a large number of food processors in the area, and they need power when the crops come in, period," explained Hondeville.

More definitive rate structures based on the detailed information an AMI system could give industrial customers greater incentive to manage their energy use. Given the nature of the food processing industry, Hondeville believes those customers may get more results from energy-efficiency measures. "We see a lot of potential for savings from upgrading lighting and compressed air systems, for example," he said. "Energy efficiency is a lot more interesting to these types of businesses than TOU rates," he added.

Where there is an interest in energy-efficiency, you can be sure that California's public utilities will come up with a program to satisfy it. And the only size that matters is the size of the energy savings. ⚡

Energy Services Bulletin

The Energy Services Bulletin is published by Western Area Power Administration for its power customers. The mailing address is Western Area Power Administration, P.O. Box 281213, Lakewood, CO 80228-8213; telephone (720) 962-7508.

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

Editor: Kevon Storie

Designer: Grant Kuhn

Want to know more?

Visit www.wapa.gov/es/pubs/esb/2008/may/may081.htm

New IRP rules streamline process, encourage sharing

In the first update of its integrated resource planning (IRP) rules since 2000, Western is implementing three proposed revisions.

Western's decision follows a public process that began with the publishing of a Federal Register Notice on Aug. 21, 2007. The changes are:

- Eliminating the requirement that members of a member-based association (MBA) unanimously approve the MBA's IRP
- Encouraging customers to cooperate on preparing regional IRPs
- Making current customer IRPs more accessible to the public by placing them on Western's or the customer's Web site

The Energy Policy Act of 1992 requires Western's firm power customers to submit an integrated resource plan to Western every five years and provide annual updates, forecasting their future electric power demand and thoroughly evaluating ways to meet it. The program is designed to extend Western's existing firm power resource commitments, and to promote energy diversity and efficient practices.

"The IRP is also a tool to help utilities determine the most cost-effective measures and resources for serving their customers," explained Energy Services Manager Ron Horstman, who led the review process. "It's important that IRP requirements reflect changes in resource options, technology, environmental issues and more that have occurred in the industry."

"Our goal was to make it easier for

our customers to address emerging trends and shifting conditions in their IRPs," said Western Administrator Tim Meeks. "We believe these revisions to the rules will help make the planning process more effective and efficient."

Dialogue with customers

Building a better planning process required input from those who will be using it. A 90-day public comment period, from Aug. 21 to Nov. 19, 2007, gave customers and other interested parties the opportunity to weigh in on the proposed changes. At a public forum Western held in Denver Sept. 6, about 20 people attended including representatives from Platte River Power Authority and the Colorado Association of Municipal Utilities who provided comments for the record.

Western also received written comments from Colorado River Energy Distributors Association, Delta-Montrose Electric Association, Irrigation & Electrical Districts Association of Arizona, Kansas Electric Power Cooperative, Platte River, Salt River Project, Tri-State Generation and Transmission Association, Utah Associated Municipal Power Systems, Utah Municipal Power Agency and Arizona Municipal Power Users' Association.

"The public participation period is not just about complying with Federal law," said Horstman, "For Western, it's about listening to our customers' concerns and looking for the best way to balance customer needs with the law requiring them to do IRPs."

Speeding up approval

Simplifying processes is a need that many an overstretched public utility employee can agree on. The first change, eliminating the need for all members of an MBA to approve the MBA's IRP, is intended to provide some relief. Under the new rule, the IRP only needs the approval of the governing body of an MBA, which represents the interests of each member. "That requirement tended to bog down the approval process for MBAs with large, diverse memberships," Horstman acknowledged. "Getting all members to agree and sign the plan could take up to a year. By that time, the issues changed."

This revision will significantly shorten the IRP approval process, ensuring that the IRP is relevant for the period it covers. "This is a valid concern as conditions change quickly in the energy industry," said Horstman.

Small customers will continue to have as strong a voice in their MBA's plan as they always have. The revision will put greater emphasis on the public participation process, observed Horstman. "That's the main forum where members can present their concerns."

Member utilities also have the option of creating their own IRPs tailored to their unique circumstances. This could reduce the workload for members that actively participate in developing their MBA's plan, because individual power providers may qualify for one of the other IRP options such as the small customer

See NEW IRP RULES page 4

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2008/may/may082.htm

New IRP rules

from page 3

plan, the minimum investment report or the energy efficiency/renewable energy report. “And the utility will have the opportunity to get a real handle on its needs,” added Horstman.

Regional planning

The second rule adds a paragraph to IRP regulations to encourage utilities, both Western customers and non-customers, to work together on regional IRPs. This is a clarification, rather than a change, to the current IRP requirements. Utilities have never had to be part of an MBA, or even a Western customer, to be included in a regional IRP submitted by Western customers. “Most IRPs have not typically considered regional issues,” Horstman said, “which is a shame because coordinated efforts can often yield greater benefits than individual, piecemeal measures achieve.”

Cooperation among regional utilities is a natural, Horstman asserted, since they often share conditions that affect demand, such as customer demographics, climate and local economy. The hope is that the new language will open the door to more utilities collaborating on regional plans that include both supply-side and demand-side activities.

Wind farm development and expanding the transmission system are examples of projects where several neighboring utilities could share the risk, work and rewards. “They could team up on the required environmental clearances, testing and permitting, and the whole region would benefit from the jobs, clean power and stable energy costs,” said Horstman.

Same rule, new media

The third change to IRP requirements allows Western to post current customer IRPs on its Web site so the plans are readily available to the public. This rule received the most comments of all the proposals; understandable since security and protecting confidential information are growing concerns in the utility industry.

Customers may request that confidential commercial and financial information not be disclosed when they file their IRPs. If Western agrees that the information is exempt from disclosure under the Freedom of Information Act (FOIA), those sections would be deleted from the plan before it is posted on the Western Web site. Horstman pointed out that, under FOIA, Western has always had the right to determine what can be deleted from IRPs. “The law requires the IRP process—and all changes to a plan—to be open to full public participation. That’s nothing new,” he said.

What is new for Western is making IRPs available to the public through the Internet. Responding to customer comments, Western modified the original proposal to give customers a choice. The customer may post its IRP on its own site, and Western’s site will link to the plan. Alternatively, if the customer chooses not to post its IRP on its own Web site, Western will post the IRP on its Web site. Interested parties may also submit a FOIA request to Western to obtain a copy of the IRP.

Western shares customer concerns about preserving confidential information in IRPs filed with the agency. “Western, consistent with existing rules, will continue to seek

our customers’ views on whether information in an IRP is exempt from disclosure under FOIA,” said Western Attorney Advisor John Kral.

More sharing

This new rule has the potential to create a valuable reference for customers developing IRPs. “Customers will be able to look up similar utilities and see what programs and measures worked for them,” said Horstman. “It could even facilitate regional collaborations or other types of partnerships.”

Sharing information: It’s how Western and Energy Services help customers manage their power resources more effectively. In return, customer input helps us shape the rules that ensure that Western continues to provide low-cost, reliable electricity. We thank everyone who contributed comments.

If you have further questions about the revisions, contact Ron Horstman at 720-962-7419. ⚡

May is National Electrical Safety Month

See our calendar
for more events

[www.wapa.gov/es/pubs/
esb/2008/may/may08coe.
htm](http://www.wapa.gov/es/pubs/esb/2008/may/may08coe.htm)

New workshop series offers in-depth look at DSM technologies

Demand-side management (DSM), a good strategy utilities used to save energy in the 1970s, can be even more effective when 21st century technology is added. Western is planning a series of workshops in the Upper Great Plains (UGP) to show customers how to incorporate the latest advances into their DSM programs.

Narrowing down topics

Western sponsored several Introduction to DSM workshops and webinars last year to help power providers revive old programs or launch new ones. The new workshops will go beyond the “how-to” basics to offer in-depth looks at specific technologies, said UGP Energy Services Representative Mike Radecki. “Energy services managers need to know what the options are so they can design DSM programs that meet their unique challenges,” Radecki said. “We want to go into some depth, instead of just glossing over everything that’s out there.”

That meant dedicating each workshop to only one or two systems. Radecki asked several wholesale cooperatives in UGP territory what topics their members would find most useful. The technologies that came up most consistently were lighting, motors, variable-frequency drives, HVAC and chillers, with lighting topping the list.

Missouri River Energy Service (MRES) recently began to offer incentives for upgrading equipment in all five areas, said MRES Energy Services Manager Joni Livingston. “And about 90 percent of our applications so

far are for lighting projects,” she noted.

“We would eventually like to do workshops on all the topics, but lighting is the easiest upgrade with the quickest return,” added Member Development Manager Corrinne Pedersen of NMPP Energy.

Easy to install, yes, but lighting is a good example of why technology-focused workshops are needed. With so many lighting products on the market and just as many applications, it can be difficult to figure out which one will yield real energy savings. “A lot of customers are asking questions that can’t be answered without doing research first,” said Livingston.

Local case studies

Commercial and industrial lighting was the unanimous choice for the first DSM technology workshop, although the agenda will conclude with a brief discussion of the other key technologies.

Basin Electric Power Cooperative agreed to cosponsor the first day-long event June 18 at the Kelly Inn in Bismarck, N.D. “Our target audience is energy services and member services managers and key account executives,” said Chad Reisenauer, Basin key accounts and energy conservation coordinator. “We encourage our members to bring along their key accounts as well.”

DSM specialists and lighting experts are among the invited



With such a wide variety of lighting technologies, utilities have a lot of questions about which would be the best choice for DSM programs and projects. (Photo by Lighting Research Center, New York)

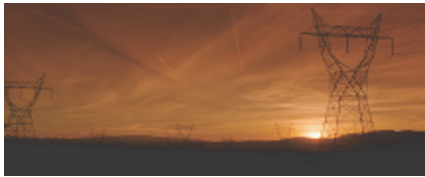
speakers, and the agenda will feature case studies of successful lighting projects in the area. That “backyard connection,” as Radecki calls it, is an important aspect of the workshops. “Energy-efficiency measures that work in Arizona are not likely to give the same results in North Dakota,” he said. “We want participants to see how measures are going to work within a context similar to their own circumstances. They may even be able to go to the facilities to look at the systems themselves.”

Western customers who would like to suggest case studies for the Bismarck workshop can submit ideas online. Ideally, case studies would involve a Western customer from the Bismarck area and include a description and overview of the technology, with examples of the utility deploying it. Lessons learned and trends emerging from projects should be covered, as well as costs and benefits and additional information resources.

Workshops are also planned later in the summer in Rapid City, S.D.; Sioux Falls, S.D., and Grand Island, Neb. Suggestions for lighting case studies in and around those cities will

See NEW WORKSHOP page 7

**Want to know more?
Visit www.wapa.gov/es/pubs/esb/2008/may/may083.htm**



TOPICS from the POWER LINE

Many choices for water districts looking to go solar

Question:

One of our customers, a large metropolitan water district, is interested in using solar energy to power some of their remote operations. Do you have any examples of such projects?

Answer:

There are several examples of water district pumping stations in California and Nevada that have installed, or are now building, photovoltaic arrays at pumping stations, water recycling plants, vehicle refueling stations and offices.

In addition to photovoltaic systems, your customer may also want to consider concentrating solar thermal and concentrating photovoltaic technologies. Power generated by non-concentrating PV arrays is more expensive than power generated by conventional power plants in most locations. On the other hand, concentrating solar power is becoming cost competitive with conventional power, depending on scale. The cost effectiveness of concentrating solar systems can be greater than that for non-concentrating system at capacities of a few kilowatts and more.

Your customer should not overlook other types of renewable generation systems. Micro- and mini-hydropower systems in fish-free distribution and drainage runs may be a viable option for a water district. Wind might

also be considered, depending on resources in your area. The Power Line can supply information on these opportunities, as well.

Facilities with PV

PV arrays offer several advantages for businesses and industrial facilities that want to build on-site generation. The systems are relatively easy to install and connect; siting PV arrays is easier than conventional power plants; and solar plants can be expanded incrementally. On the other hand, solar-generated electricity still costs more than electricity from conventional plants in most places. Concentrating photovoltaic systems use low-cost lenses or mirrors to focus sunlight on photovoltaic cells. Concentration can improve cost effectiveness because fewer high-cost PV panels are required. Nevada Power installed a concentrating photovoltaic array at their Clark PV Station, but there are no examples of concentrating PV systems at water districts.

The Las Vegas Valley Water District (LVVWD) solar project consists of photovoltaic arrays at six reservoir and pumping station sites. Built by Sunpower, the arrays range from 330 kW to 851 kW with a combined power of 3.1 MW. This is the largest photovoltaic project built by a public agency in the United States.

LVVWD also completed a solar

hydrogen refueling station for its fleet operations in April 2007.

California offers several examples of water districts that have installed solar arrays. West Basin Water Recycling Plant, just south of Los Angeles International Airport, built three solar arrays totaling 590 kW. The Semitropic Water Storage District in Kern County completed a 1-MW system, and the Idyllwild Water District recently dedicated a 42-kW solar PV system. It serves a 50-HP system that pumps water from six wells to an aeration plant that removes iron and manganese, then to a filtration plant and on to storage.

Solar thermal energy

When discussing power generation, “small-scale” generally refers to systems of a few megawatts or less. However, this would be considered large-scale for a water sector facility.

Solar parabolic troughs, parabolic dish and concentrating PV systems may be a good fit for water district projects. A nice summary of concentrating solar projects is available in A Look at the U.S. Concentrating Solar Power Market, a PowerPoint presentation by Fred Morse of Morse & Associates.

Activity in this area has picked up in recent years, after a long period of stagnation. Slide 7 gives a list of concentrating solar projects that have been completed or are in progress, as of December 2006. As an update, the 64-MW Nevada Power Solar One project was completed in 2007. Projects on this list include parabolic troughs, parabolic dish and concentrating PV projects.

See TOPICS page 7

Want to know more?
Visit www.wapa.gov/es/pubs/2008/may/may084.htm

Topics *from page 6*



Arizona Public Service Company's Saguaro Generating Station is an example of solar trough technology. (Photo by Carol Shipman, APS)

Parabolic trough

If the water district has pumping stations or other facilities of about 1 MW or more, an organic-cycle parabolic trough system may be an option. The National Renewable Energy Laboratory (NREL) report Solar Trough Organic Rankine Electricity System (STORES) Stage 1: Power Plant Optimization and Economics summarizes the advantages of small parabolic trough systems:

- A small solar trough power plant could be built quickly and provide local value.
- STORES would focus on the retail market rather than wholesale,

because local value and prices may be higher.

- Such plants could be modularized with proper optimization to achieve economies of production.
- If the market existed, the plant could be automated and scaled up or down, depending on the customer's needs.

Arizona Power Systems' Saguaro parabolic trough power plant has been in operation since December 2005. At 1 MW, this is a small plant for a power generation facility, but is the same size as some large water district pumping stations. Organic rankine turbines are more cost-effective at this scale than the steam turbines typically used in larger plants.

Organic rankine cycles use an organic fluid—in this case pentane—as a working fluid instead of steam. The solar field typically accounts for about 75 percent of the capital costs.

Parabolic trough systems are available for large commercial, industrial and institutional operations.

Manufacturers of parabolic troughs include:

- Acciona (formerly Solargenix)

- Solucar (formerly Industrial Solar Technology Corp.)
- Solitem

Parabolic dish

Facilities requiring 3 kW or more should consider installing a parabolic dish and Stirling engine system. Parabolic dish systems have been in the development phase over several decades and only recently have begun to be installed in commercial-scale operations.

Parabolic dish Stirling Energy Systems will be providing San Diego Gas & Electric with 300 MW of power generated from 12,000 dishes with Stirling engines. A 500-MW parabolic dish project will also be installed by Southern California Edison.

STM Power's SunDish system has been operating at the Salt River Landfill near Scottsdale, Ariz., for almost a decade. Each SunDish system produces 22 kW by reflecting and concentrating the sun's rays onto the receiver of a Stirling engine that operates a generator producing 480 Volt, 60 Hz, power. The landfill facilities and the SunDish support system use the resulting electricity. ⚡

New workshop

from page 5

also be needed. Customers can also submit case studies for the other four technologies.

All invited

Western customers and their key accounts can register online for the June 18 workshop. Of course, all Western customers are welcomed, but the regional focus of the material will make the workshop most

relevant to utilities in the Bismarck area.

Online registration will be available, so watch the Energy Services Web site for the link. A \$50 registration fee will include reference handouts, refreshments and lunch.

Some scholarships will be available for teachers, so they can take what they learn back to the classroom. "It's not that we expect teachers to make decisions about facility upgrades," Radecki explained. "Schools are always looking for

ways to enhance their science curriculum, and utilities are always looking for ways to increase public understanding of energy efficiency. The workshop is a good opportunity for community outreach."

For more information about the DSM lighting technology workshop in Bismarck, N.D., contact Mike Radecki at 406-247-7442, or Chad Reisenauer at 701-355-5710. Watch the Energy Services Web site for announcements about future workshops. ⚡

Web site of the month:

EPA's WaterSense program—www.epa.gov/watersense/

Treating, transporting and heating water consumes about 8 percent of the nation's energy supply, so even utilities that are not water suppliers have an interest in encouraging water conservation. The Environmental Protection Agency's WaterSense partnership program is an excellent place to find ideas for promoting water efficiency to consumers.

Working with manufacturers, retailers and distributors, irrigation professionals, certifying organizations and promotional partners, the program aims to protect the nation's water supply and enhance the market for water-efficient products. The WaterSense label on a product tells consumers that it has been independently tested and meets EPA criteria for water efficiency and performance. Programs and practices may also qualify for the WaterSense label.

Education resources

Utilities, state and local governments and other public entities may join WaterSense as promotional partners, sharing ideas with the program and promoting the WaterSense philosophy to the public. Guidelines and forms for joining are available on the Web site.

There are many good reasons for utilities to join WaterSense, starting with reducing operating costs. Saving water helps utilities meet environmental goals, and can strengthen community relations. WaterSense provides partners with a promotional tool kit to let consumers know what

their utility is doing to conserve water resources and how they can help. The kit includes sample bill stuffers, press releases and public service announcements and fact sheets on different aspects of the program.

Fact sheets cover general water efficiency and water supply, plumbing fixtures and irrigation. The irrigation fact sheets primarily target landscape, rather than agricultural, irrigation—not surprising since landscaping accounts for 30 percent of the water American households use. For consumers, there is advice on lawn watering and plant selection to help create attractive and water-wise environments. Irrigation professionals will find information on certification programs to expand their qualifications.

What You Can Do offers more targeted tips for helping consumers, businesses, communities and utilities save water and protect the environment. Utilities will find guidelines for developing water conservation plans, along with case studies and ideas for system improvements, programs and policies.

Water-saving products

The product guide is one of the most important components of WaterSense, and you don't have to be a partner to use it. Utilities can find WaterSense-labeled toilets, sink faucets and showerheads for incentives programs, promotions or



Look for the WaterSense label to choose quality, water-efficient products. Many products are available, and don't require a change in your lifestyle. (Artwork by Environmental Protection Agency)

simply to answer consumer questions. A U.S. map helps visitors locate WaterSense partners in their area, including vendors, certified professionals and promotional partners that may offer rebates for installing a product.

Information about certification criteria will be valuable to customer service representatives explaining the benefits of WaterSense products to consumers. Manufacturers can learn what steps are involved in earning certification for their products.

Conservation for kids

It's never too early to start educating the next generation of consumers, and the WaterSense Kids site can help.

WaterSense Kids explains the importance of saving water in easy-to-understand terms and offers simple tips children can put to work at home. The Test Your WaterSense game lets kids move the water-efficiency hero Flow through water pipes and answer water-efficiency questions while avoiding water-wasting monsters.

Most importantly, the interactive educational site has a link to the WaterSense product guide for parents. Introducing WaterSense Kids to teachers in the community may be just what is needed to start a rush on water-efficient products in your service area. ⚡

Want to know more?

Visit www.wapa.gov/es/pubs/esb/2008/may/may085.htm