

# BULLETIN

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

## SOLAR POWER HELPS PALO ALTO GROW GREENER EACH YEAR

**P**alo Alto, Calif., is earning recognition on its quest to become one of the greenest cities in America, most recently for its solar achievements.

### GOOD COMPANY

When the National Renewable Energy Laboratory (NREL) released its list of Top 10 Utility Green Power Leaders for 2012, the municipal utility's PaloAltoGreen program once again topped the customer participation rate category. The City of Palo Alto Utilities (CPAU) beat out the much larger Sacramento Municipal Utility District, as well as Silicon Valley Power in that category. All three Western customers also placed in the Top 10 for green power sales as a percentage of total retail electricity sales.

The Solar Electric Power Association (SEPA) placed CPAU seventh nationwide for penetration—the number of solar systems per customer—in its 2012 Utility Solar Ranking report. CPAU joins another one of Western's California municipal customers, Roseville Electric, on that list.



PaloAltoGreen, the city's voluntary green power program, supports projects like this 75-kilowatt solar array at the Palo Alto Municipal Service Center. The Environmental Protection Agency's Green Power Partnership rated the program number one in customer participation rate in the country in 2012. (Photo by 3degrees)

These distinctions are an honor, but nothing new for Palo Alto, Utilities Communications Manager Debra Katz pointed out. "Every year since 2008, we've ranked number one on the Green Power Network's list for customer participation," she said. CPAU has also made SEPA's Top Ten for cumulative installed solar watts per customer for the last five years."

### THE SECRET OF SUCCESS

California's policies have helped

state utilities increase solar deployment, but there are other reasons behind Palo Alto's solar leadership.

An educated, environmentally-conscious and relatively prosperous community is a great starting point. "Palo Alto's customers care about clean energy and many have the resources to promote technologies like solar electricity," explained Katz.

A utility that has the wisdom to offer customers a variety of ways to invest

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in renewables helps too. Through PaloAltoGREEN, residential customers could pay an extra \$0.015 per kilowatt-hour (kWh), or about \$9.75 per month on average, for renewable energy equal to 100 percent of their electric use. Businesses could buy renewable energy in 1000-kWh blocks for \$15. The PV [photovoltaics] Partners Program offers incentives to those who want to install individual systems. Council members who vote for carbon-neutral electric supplies and solar power purchase agreements represent a cost-free way for citizens to support renewable energy development.

The city also has the advantage of decades of experience with solar programs. "Not only have we had time to fine-tune our offerings, but our customers have been hearing about the programs for years and years," Katz said. "In public outreach, as in advertising promotion, people need to hear about a product or program multiple times before they take action. Our PV Partners Program has benefited

from what I call the 'snowball effect.' The more people see and hear about the technology, the more they feel familiar with it and willing to install and support it, which means even more people see and hear about it—and so it grows."

### DON'T STOP NOW

Not about to rest on its kudos from the solar industry, Palo Alto continues to expand and improve its solar program. Helping customers to connect with high-quality solar contractors and supporting the local solar industry continue to be a priority for the city. One highly successful initiative involved reducing the "ordeal factor" of installing solar systems. After streamlining the solar PV system permitting process, the city issued 50 permits in less than three months—more than had been issued in the previous year!

The Palo Alto CLEAN feed-in-tariff program is another relatively new initiative designed to encourage solar installations on commercial rooftops—the most open space available in the built-out town. No takers have come forward yet, however, due in part to the successful PV Partners program, Katz acknowledged. "So far, building owners seem to prefer getting a rebate to generate electricity for their own businesses, rather than installing a system to sell power to the city," she said. The utility is expanding its outreach efforts to find the right match between customers, solar system installers and third-party investors, Katz added.

As part of its carbon-neutral electric supply plan, Palo Alto will continue to pursue long-term solar power purchase agreements. "Currently, we still have to purchase some market

power each year and then 'scrub' it by buying an equivalent amount of RECs [renewable energy certificates]," said Katz. "The long-term solar agreements will make 100 percent of our electric supply carbon neutral without our needing to purchase RECs to 'green up' market power."

### KEEPING UP

Now that all Palo Alto customers receive carbon-neutral electricity, PaloAltoGreen will be undergoing some changes in the near future. The city is in the process of redesigning the program, with the goal of raising the bar even higher for customers who are willing to invest in a more sustainable future.

In September the city council reviewed several recommendations from the utility advisory committee to modify the program. The staff is investigating new options for residents, while continuing to offer businesses the chance to support the growth of solar power in Palo Alto and California, and the accompanying economic benefits. "We will have a revised residential program available in 2014. We want to maintain the momentum created by the past 10 years of enthusiastic customer participation in this award-winning program," Katz stated.

No doubt Palo Alto, with its enthusiastic, committed citizens and visionary city leaders, will come up with new and innovative ways to reduce their community's environmental impact. And the recognition will keep on coming. ⚡

## ENERGY SERVICES BULLETIN

The Energy Services Bulletin is published by Western Area Power Administration for its power customers.

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

## ENERGY-EFFICIENCY PROGRAM COOLS PEAK DEMAND IN NEEDLES, CALIF.

With its air conditioner rebate program, the desert city of Needles, Calif., is proving that even a small municipal utility can benefit from the right energy-efficiency program.

The City of Needles Public Utilities Department is a relatively young municipal utility (established in 1982) serving a 130-year-old railroad community of about 5,000. It has a significant population of retirees, old housing stock, an annual load factor of less than 37 percent and an extreme summer peak. Those would be enough reasons to launch an air conditioner rebate program, even if the utility wasn't in a state that mandated a 10-percent reduction in forecasted electricity consumption within 10 years.

Fortunately, the state's public benefit fund provides Needles PUD with the resources to make that happen. The California Public Utility Commission (CPUC) authorized utilities to collect a 2.85 percent surcharge on electricity bills. Electric utilities use this money to implement energy-efficiency and low-income assistance programs—both of which apply to the Needles air conditioner rebate.

### PARTNERS IN SAVINGS

With a budget of \$150,000 annually, the utility provides seniors and low-income customers with free air conditioners that have a seasonal energy-efficiency ratio (SEER) of 14 or higher—on one condition. Customers must get their homes weatherized to be eligible for a new unit. "The goal of the program is to reduce our demand by 2 percent each year," said Needles City Manager David Brownlee. "We won't hit that target by installing high-efficiency air conditioners in 'Swiss cheeses'—130-year-old houses."

The annual enrollment cycle starts on July 1. Ratepayers must

apply for weatherization through the Community Action Partnership of San Bernardino County (CAPSBC). Since the program began, it has always been fully subscribed by the end of August.

The agency compiles a waiting list of applicants, and sends out contractors when the list is full. "Needles is 200 miles from the county seat, so they are not going to come out for one home," Brownlee explained.

CAPSBC performs the weatherizations over the fall and winter, and customers present proof of weatherization to the utility. Brownlee contacts River Valley Air Conditioning, the local vendor that supplies all the units for the program. River Valley presents a proposal for installation of the units—32 to 33 each year, said Brownlee. "We are lucky that River Valley cut a good deal with the manufacturer," he observed.

River Valley starts installing units in May and the process is completed with payout the following July. Sometimes, the utility makes an exception, though, for special cases. "An 80-year-old woman came in to ask about the rebate, and we learned she had been without air conditioning for two years," recalled Brownlee. "We got a unit into her house the next day. In this climate, air conditioning is literally a lifesaver for seniors."

### HELP FOR RENTAL UNITS

In a city where nearly half the population rents rather than owns housing, a program that aims to reduce demand must find a way to reach that historically hard-to-reach market. Needles PUD did not shrink from the challenge. If a customer applying for the program doesn't own the home, Brownlee tries to engage the landlord. The utility asks the property owners to pay 25 percent of the equipment cost. Also, for the property to qualify for the rebate, the tenant must stay for two years.

Lower electric bills and greater



A technician from River Valley Air Conditioning installs a new high-efficiency unit for a Needles homeowner. River Valley, a local business, provides the air conditioners for the city's rebate program. (Photo by River Valley Air Conditioning.)

comfort can help landlords retain tenants in such an active rental market, and provide valuable selling points when the property is vacant. Nevertheless, energy efficiency continues to be a hard sell for multifamily units, and Brownlee said that the program will be focusing more on this demographic in the future.

With a demand reduction target of 0.2 megawatts for Fiscal Year 2012-2013, the city of Needles will be on the lookout for more opportunities like multifamily properties to expand its successful air conditioner program. But the ambitious goal seems within reach—the program helped the utility reduce its peak demand by 178 kilowatts and 177,814 kilowatt-hours in 2011, and by another 3 percent last year.

As important as numbers are for measuring the effectiveness of a program, however, the greatest satisfaction can come from those moments in the field. "It feels great to replace a pre-SEER air conditioner with a high-efficiency model," observed Brownlee. "And sometimes, we get lucky and switch out a three-phase unit." ⚡

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

# BUILD PROGRAM AROUND DISHWASHERS TO CLEAN UP ON ENERGY, WATER SAVINGS

**D**ishwashers are an extremely popular household appliance with both conservation-minded consumers and utilities with load-management goals because they offer opportunities to save energy and water. Whether you are thinking about starting a rebate program, revamping your current offerings or just looking for a good bill stuffer, don't forget to consider this workhorse.

## STANDARDS GOING UP

The recent increase in energy-efficiency standards for dishwashers make upgrading an old model even more attractive. The Department of Energy gathered input from manufacturers, consumer groups and environmental advocates to craft strong regulations that will save consumers an estimated \$20 billion in energy and water costs.

The amended standards apply to all standard and compact dishwashers manufactured in, or imported to the United States as of May 30, 2013. Standard models—designed to hold eight or more place settings plus six serving pieces—must use no more than 307 kilowatt-hours (kWh) per year, and 5 gallons of water per cycle. For smaller, compact dishwashers, the maximum annual energy use is 222 kWh per year, and 3.5 gallons per cycle. The changes improve energy use by 15 percent and water use by 20 percent over the prior standard of 355 kWh/year and 6.5 gallons/cycle for standard dishwashers and 260 kWh/year and 4.5 gallons/cycle.

## PICKING, CHOOSING

Setting up an incentive program for high-efficiency dishwashers may require utilities to do some demographic research or number crunching, but at least Energy Star makes it easy to decide on eligible models. If your territory is far from a major metro area, the Top Ten USA listing can be helpful, too, with its dealer search function.

Water utilities may need to dig a little deeper for recommendations if they have water savings goals. Some ENERGY STAR models use half as much water as others, saving hundreds of gallons of water each year. Here again, Top Ten USA may be useful for building relationships with dealers who can help you locate the best models to meet your customers' needs—and yours.

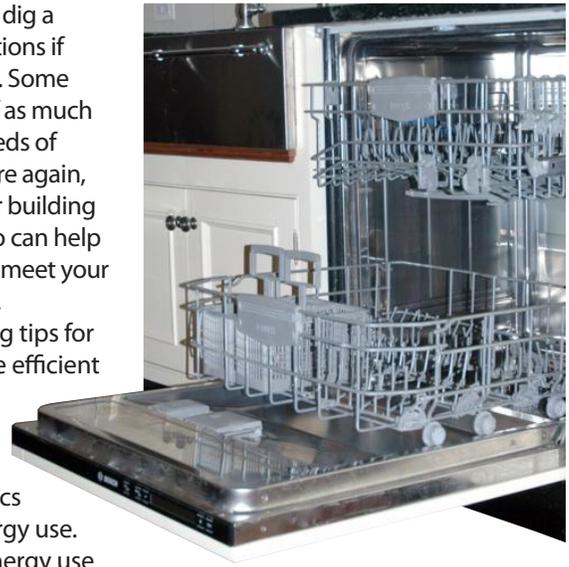
Here are a few more buying tips for consumers looking for a more efficient dishwasher:

- Check the yellow EnergyGuide label on each product for specifics about that model's energy use. Aim for an estimated energy use of 295 kWh/year.
- Read the manufacturer's literature to find out about water use (utilities: educate your member services representatives about the most water-efficient models).
- Look for different wash-cycle selections. More options make it easier to tailor the energy and water use needed for a particular load.
- Choose a dishwasher with an energy-saving no-heat drying feature. This feature circulates room air through the dishwasher by fans, rather than using an electric heating element that can consume about 7 percent of dishwasher energy use.

## USE IT WISELY

As with any other appliance, operator behavior affects performance, so share these tips for efficient operation with new dishwasher owners:

- Don't pre-rinse dishes before washing; just scrape leftover food off without using any water. New, efficient dishwashers should be able to handle a little food residue. On the other hand, pre-rinsing pays off with



This Bosch dishwasher uses approximately 2.01 gallons per cycle, while most water-efficient dishwashers use twice as much water. Older dishwashers can use up to 15 gallons of water per cycle. (Photo courtesy of EcoHouse Walk)

models that have built in "soil-detectors." These sensors for both food residue and water level can detect a small load, and choose a cycle that uses less energy to handle it.

- Lower your hot water tank temperature. Your new dishwasher also has a heating element that heats the water to 140F, the optimum temperature for breaking down soap. Lowering your water heater temperature to 120F saves a lot of energy on hot water.
- Don't use too much soap, especially if your water is soft. The dishwasher doesn't need a lot of detergent to get the job done.
- Avoid heated drying. As mentioned before, those electric heating elements use a lot of electricity even on new dishwashers. Either use the fan-dry feature, or just open the dishwasher, turn dishes with

See *DISHWASHERS*, page 7



## TECHNOLOGY SPOTLIGHT:

# HIGH-VOLUME, LOW-SPEED FAN TECHNOLOGY

If you have gone into a warehouse such as Costco, heard a faint “whooshing” sound and looked up to see something that looked like a helicopter rotor, you have just encountered a high-volume, low-speed (HVLS) fan.

An HVLS fan is a large-diameter mechanical fan that works much like the ceiling fan in your home. In environments ranging from restaurants and shopping malls to warehouses and dairy barns, HVLS fans maintain comfort without the noise or energy consumption of a conventional, propeller-type fan.

### WHAT IS AN HVLS FAN?

Available since the late 1990s, HVLS fans are designed to provide a large amount of airflow at a lower speed than conventional fan technology. One of the first innovators of the HVLS technology was MacroAir, which developed this type of fan to solve ongoing problems in large dairy barns. Generally, these facilities used dozens or hundreds of two-foot diameter constant speed fans, which consume a lot of energy and are a maintenance headache. MacroAir’s solution was to design larger fans, up to 24 feet in diameter, that could run at lower speed with variable frequency drive (VFD) control, providing more airflow with fewer fans on a fraction of the energy. Since then, many companies have developed and marketed products based on this technology for a variety of applications.

Size is not the only thing that sets HVLS fans apart from conventional equipment. The HVLS airfoil is engineered according to MacroAir’s standards to maximize airflow at a lower speed. The fan must meet the following design criteria:

- The volume of air passing through the fan in a single



The HVLS AirVolution fan from MacroAir generates a large column of air that flows down to the ground and outward 360 degrees. The large, slow-moving air mass moves throughout the space, mixing and circulating air more efficiently than a conventional fan. (Photo by MacroAir)

revolution must be no less than 500 cubic feet

- The tip speed of the fan’s blades must not be greater than 60 MPH

With these features, the fan is able to provide more airflow at a relatively low motor speed using VFD control.

### NON-ENERGY BENEFITS

With any fan, the slower the speed, the more energy savings you get, so HVLS systems deliver energy savings by providing the required airflow at a reduced motor speed.

Fans with control setups increase savings by allowing the building manager to vary the system’s operation based on circumstances like outdoor temperature or business operating hours. Most heating and cooling systems are designed for the worst-case scenario. For a conventional cooling fan, that often means sizing and installing it to deliver the maximum airflow needed when the temperature hits triple digits. This is good for the few days of extreme heat per year, but the fan continues to operate at that level the other 360 days when less airflow is needed.

HVLS fans can solve this problem with control settings that adjust the speed (varying airflow) depending on the conditions. In a warehouse or barn, for instance, HVLS fans could be

programmed to turn on at 50-percent speed when the outside air temperature reaches 70 degrees Fahrenheit, instead of running at full speed all the time. As the air temperature increases, the fan speed can also be increased as needed.

Depending on the application, manufacturers of HVLS fans estimate that their cooling systems could save 30 to 70 percent of the energy used by a conventional fan. HVLS fans can also reduce space-heating requirements in large spaces by improving the de-stratification of warm air. Especially in buildings with high ceilings, warm air can rise and leave the air at floor level up to 30°F colder. Once an HVLS system is installed, the thermostat could be lowered 6 to 8 degrees, while maintaining the same level of comfort.

The many non-energy benefits of HVLS fan technology include improved air quality and comfort, and quieter operation. The reduced noise level of HVLS fans, compared to conventional fan types, is good for industrial facilities and public spaces alike. As an energy-efficient and cost-effective alternative to conventional fans, an HVLS system may also qualify for utility incentives or grants on a retrofit or new construction project.

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WEBSITE OF THE MONTH:  
**INCIWEB**

In the drought-ravaged West, wildfires are increasingly a year-round problem, rather than a seasonal event, and dealing with their impact on utility service is becoming an all-too-familiar challenge to power providers. Utilities serving territory that includes wildland urban interface—the zones where human development mingles with areas of undeveloped vegetation—should bookmark InciWeb.

InciWeb is an incident information management system developed to give the general public and the public affairs community a single, standardized source for obtaining information about wildfires. Several federal agencies involved in firefighting and prevention and wildland management contribute to the site.

The home page of this no-frills website displays a searchable database of current fire-related incidents with the most recently updated information listed first. The table is organized by incident or name of the fire, type (wildfire, prescribed fire, etc.), unit or geographic location, state, status (active, inactive), acres involved and the time of the latest update. By clicking on the header of each column, the user can change the sorting order from ascending to descending.

### **CONFUSING NAVIGATION**

The search function in the upper right corner of the page allows users to select a specific fire incident by name or sort incidents by state. A second data filter directly to the right of the table sorts incidents by maximum age, activity status and type of incident. These critical functions could be better placed on the page for visibility, and could be hard to find for first-time visitors.

# InciWeb

## Incident Information System

Beneath the gray banner located above the table are tabs that provide additional details about fires: Incidents, Announcements, Closures, News, Photographs and Maps. “Incidents” is basically the same as a “Home” button to return users to the home page table. As the title suggests, Closures lists areas that are closed to the public due to firefighting efforts, along with changes in closure status. This information may also appear on Announcements and News.

The News page contains the latest updates on active incidents, which makes its position as the fourth option on the tab bar after announcements and closures seem odd. In addition to closure information, Announcements covers final updates on fires, public meeting announcements and related news about weather and affected communities.

Searching a state from Announcements, Closures or News will take users back to the Incident page for a list of all incidents in that state. The user must then select one of the subsequent tabs to get state-specific information.

### **WORTH A THOUSAND WORDS**

The Photo library may be more useful to the news media, but utilities might want to post pictures of incidents on their websites to remind customers of fire dangers

in their service territory. Make sure your webmaster credits the photo to InciWeb.

Even more valuable from a safety standpoint is the Maps page. Field crews can download maps showing fire perimeters, topography, search and rescue areas and more critical information that can be lifesaving during a wildfire.

### **KNOW YOUR ENEMY**

In the footer of InciWeb pages are two more links to help further your education about wildfires. Links connects users to agencies that can provide more information before, during and after an incident. These resources include reports and statistics, mapping tools, fire prevention, firefighters’ organizations and national and regional fire information centers.

The second link, Terminology, can help you understand what dispatchers and firefighters are talking about when they are describing an incident. When a fire is burning in your service territory, arming yourself with knowledge is the best way to keep the power on, restore power quickly and keep your crew safe while they work. ⚡

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

## Technology Spotlight *from page 5*

### MANY APPLICATIONS

Commercial HVLS fan technology has benefitted many types of operations including:

- Livestock barns
- Warehouses
- Distribution centers
- Shopping malls
- Skating rinks
- Heath clubs
- Swimming pools

If your customers are interested in ventilation or de-stratification in a large open area, encourage them to consider HVLS fans and consult the resources below. HVLS fan manufacturers and vendors also offer calculators and tools to determine sizing and potential savings. Western customers can contact the Energy Experts hotline at 800-769-3756 for technical assistance.

### VENDORS:

- AirMotion Sciences
- Big Ass Fans
- Kelley Entrematic
- Rite Hite

### ARTICLES:

- *Efficient, Effective Air Movement: How to Justify HVLS Fan Systems*  
Cisco-Eagle
- *H.T. Lyons Reduces AC Tonnage by 25% with MacroAir HVLS Fans*
- *Design of High Volume Low Speed (HVLS) Fan Supplemental Cooling System in Dairy Free Stall Barns*  
Kammel, Raabe & Kappelman
- *Large Ceiling Fans Offer Energy-Saving Way to Reduce Dairy Cow Heat Stress*  
Ontario Ministry of Agriculture, Food and Rural Affairs

- *Energy-Efficient Facts – High Volume Low Speed Fans*  
Wisconsin Focus on Energy
- *Cooling Effectiveness of High-Volume Low-Speed Fans versus Conventional Fans in a Free-Stall Dairy Barn in Hot, Humid Conditions*  
Worley & Bernard, University of Georgia
- *Ventilation Resources*  
University of Wisconsin – Biological Systems Engineering
- *Electric Power Saving Fan Options for Cow Cooling*  
Shultz & Williams
- *Comparison of High Volume Low Speed (HVLS) vs. Conventional Fans in a Free Stall Dairy Barn in a Hot Humid Climate*  
Worley & Bernard, University of Georgia ⚡

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

## Dishwashers *from page 4*

water pooled on their bottoms right side up to let the water drain, and let them air dry.

- Use the lightest wash setting possible. You'll save an entire wash cycle, and all the hot water that cycle would use.
- Only run the dishwasher when full. It's better to wash a few forks or plates by hand, if you're running short, and wait for the dishwasher to be full after the next meal, than to run it before it's full.

- Use the delayed start feature to run the dishwasher overnight. This can save the customer money if your utility offers time-of-use rates (utilities: consider incorporating this feature into a load-shifting program).

Finally, don't forget about your customers who haven't upgraded yet. Some of the above suggestions apply to older models, too, like not using too much soap and running the dishwasher only when it is full. Be careful, though, not to overcrowd it or the dishes may not get clean.

Turning the dishwasher on at bedtime takes advantage of off-peak electricity, and the water heater doesn't have to supply hot water for showers or laundry at the same time.

Conservation programs that combine old-fashioned customer education with high-efficiency equipment and technology have the best chance for success. With dishwashers, utilities can work both sides of the equation for maximum savings. ⚡

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