

Energy EFFICIENCY

July 2003 Volume 7, Issue 3

From Around the Region

New Technology & Programs

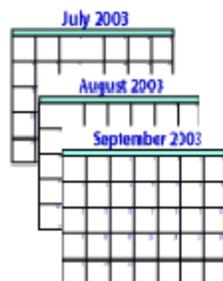
People

Traveling Exhibits

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Calendar



Click on a month to view calendar

New on the EE Web . . .

•[Energy Efficiency Expanded Standard Offer](#)

•[Energy Efficiency Residential Loan Program](#)

Other Links

•[Energy Trust of Oregon](#)

← *For more articles, please click on the sections to the left.*

Grower's Coop Saves Energy \$\$\$



BPA worked with Okanogan County PUD to help Magi, Inc., save energy and dollars. From Left: Garry Thompson, BPA Eastern Power Business Area Manager; Jim Divis, President of MAGI; and Harlan Warner, General Manager of the PUD. (Photo courtesy of *The Chronicle, Omak, Washington.*)

In August 2002, BPA and Okanogan PUD (Okanogan, Washington) signed contracts under BPA's Conservation Augmentation Program to provide energy conservation improvements at MAGI, Inc.'s facilities in Brewster, Pateros, and Okanogan.

Click [here](#) to read the rest of the story.

Non-Construction Tx Alternatives

The Bonneville Power Administration launched a new initiative to ensure it is providing the most cost-effective solutions for the region's transmission needs. BPA's Transmission Business Line (TBL) is investigating how to fully and effectively integrate non-construction alternatives into its transmission planning process. The initiative has four elements, a roundtable of regional experts and interests, a set of studies to explore specific opportunities, development of screening criteria, and pilot activities.

Click [here](#) to read the complete story.

The next issue of this newsletter will be published in mid-October.

The BPA Energy Efficiency Newsletter is published quarterly in January, April, July, and October. Please submit news items to [Newsletter](#). Or call (503) 230-5861.

Bandon Tests Microturbine

As part of the City of Bandon's (Oregon) continuing effort to investigate ways of reducing utility costs, the City is testing a propane-fired microturbine, which is on loan from BPA. The City will use the 60-kilowatt generator for the next few months to provide base data regarding the feasibility and cost effectiveness of generating electricity using microturbine technology.

The microturbine is currently running at about two-thirds of capacity, feeding about 40 kilowatts into the City's electric grid.

Click [here](#) to read the complete story.

Sustainability Photo Exhibit

A new [photo exhibit](#) soon to be available for borrowing states, "BPA is in the Sustainability Business." Pictures show numerous BPA practices and partnerships that support sustainability. We strive to continuously improve our normal operating procedures to make them more sustainable.

How have you incorporated sustainable practices into your business? *Send us your [stories](#) and we'll print them!*

Click [here](#) for complete story.



Energy EFFICIENCY

News from Around the Region

Approaching the Residential Loan Program

Click [here](#) to see examples of approaches customers are taking when signing up for or when integrating BPA's Residential Loan Program into their operations. The examples illustrate ways customers are adding the program into their conservation program portfolio and ways vendors are being approached to gain interest.

Photovoltaics for Schools

Keller School, Keller, Washington, participated in BPA's Photovoltaics for Schools Initiative in partnership with Ferry County PUD. From left to right: Chris Gregory; Keller students; Rosalie Nourse, BPA Energy Efficiency Representative; and John Friederichs, Conservation Director, Ferry County PUD.



... Grower's Coop continued from front page

MAGI is a grower-owned cooperative that packages around 3.5 million boxes of fruit each year. Under the ConAug contracts, MAGI agreed to invest over \$1 million in energy efficiency. Measures installed included motors, computer controls, fast-acting doors, heat recovery systems, and evaporative condensers. The installed measures will save MAGI

Demonstration Trailer

Chelan, Grant, and Clark County PUDs (Washington) joined to build a miniature energy-efficient model home on a 16-foot trailer (see *photo below*) that can be moved for display at fairs, home shows, and other events. The home features energy-efficient windows and

an average of about 500 kilowatts -- 20 percent of their total load -- enough energy to supply more than 200 average homes.

At the April 2003 PUD commissioners' meeting, Jim Divis, MAGI president, thanked the PUD and BPA for participating in the project.

Debra Peters of the PUD said the project is an example of the PUD's desire to help customers use energy wisely. She thanked those who participated in the project, especially BPA employees Rosalie Nourse, Energy Efficiency Representative, and Michael Huber, Mechanical Engineer.

-- Submitted by Debra Peters, Okanogan County PUD

appliances, solar roof panels, and has a fiber-optic link.

-- Jim White, jamesa@chelanpud.org



The homey appeal of the demonstration trailer draws customers in, where they can see Energy Star qualified appliances and get information on various PUD conservation programs. (Chelan County PUD photo)

Energy Trust of Oregon

The [Energy Trust of Oregon Inc.](#) is a new nonprofit organization promoting clean energy. The Trust invests in efficient technologies and renewable resources that save dollars, create jobs and protect the

environment.

[Click here for more](#)

Tacoma Power Cool Rebates

Tacoma Power is one of the first utilities in the country to offer its commercial customers rebates when they purchase Energy Star™ and SuperSaver commercial refrigerators and freezers. The rebates program began in late June.

“The most efficient commercial refrigerators and freezers use less than half the energy of standard units, but you have to know which ones to buy. Through our program we provide rebates for the most efficient refrigerators and freezers,” said Mark Aalfs of Tacoma Power.

[Click here for more](#)



Energy EFFICIENCY

New Technology

BPA is in the Sustainability Business

BPA is serious about doing business in a sustainable way. Living sustainably means we each use natural resources no faster than they can be restored. Sustainability is the practical balance between the short-term human needs of humanity and the long-term needs of the planet. Future generations will benefit from sustainable choices we make today.

[Click here for complete story](#)

Wave Energy

Generating technologies for deriving electrical power from the ocean include tidal power, wave power, ocean thermal energy conversion, ocean currents, ocean winds and salinity gradients.

[Click here for the complete story](#)

PTCS – Acronyms Everywhere We Look

Performance Tested Comfort Systems (PTCS) is only the latest of the energy efficiency acronyms. Even though it doesn't have a real marketing zing to it, it is a label that we will see a lot more of in the Northwest. Tom Eckman of the Power Planning Council has said that as much as 60 percent of the residential energy efficiency in the region over the next 20 years will depend on this complex acronym and what it stands for.

[Click here for the complete story](#)



Energy EFFICIENCY

People

Grant County Employees Win APPA Award



The Wanapum Indian employees of Grant County PUD, Ephrata, Washington, earned the American Public Power Association 2003 Community Service Award in June. The award was presented by Mark Crisson, Director of Utilities, Tacoma, Washington, Public Utilities and Immediate Past Chair of APPA's

Board of Directors. Grant Wyena, Wanapum Elder (center) and Rex Buck, Jr., Project Specialist, Wanapum Elder (far right), represented Grant County PUD. (Photo courtesy of APPA.)

The Wanapum Indian employees of Grant County PUD, Ephrata, Washington, earned the American Public Power Association 2003 Community Service Award in June.

The Wanapum employees took the lead in the design, development, and assembly of a 38 by 8 feet motor home modified to serve as a traveling exhibit depicting early Native American life in Central Washington State. Three Wanapum Native American specialists travel in the Wanapum Native American Discovery Unit (WNADU) to fairs, rodeos, schools, and

community events in Washington, Oregon, Idaho, and Montana.

The unit features a 10-foot village diorama of the old Priest Rapids Indian Village, complete in every respect, including running water in the riverside setting.

"We want to teach people that we're here and we're people," said Martha Tahmalwash, a Wanapum cultural resource specialist with Grant County PUD. "We want to teach non-Indians that we have a culture and still practice our ways and try not to let them die out."

-- Gary Garnant, Public Affairs Officer, Grant County PUD

(509) 754-5027

(From an article written by Gary Garnant and first published in the Spring 2003 issue of the APPA Quarterly Communicator.)

Mira -- Energy Efficiency Mechanical Engineer & Fuel Cell Program Manager

Mira Vowles, Energy Efficiency's Fuel Cell Program Manager, is featured in a new recruiting segment of BPA's web site. Mira's helping to generate interest in BPA by explaining what she does during a "typical" day at BPA. This was a natural activity for Mira who does a lot of volunteer work with students.

Read more [here](#).

Cowlitz Compliments Engineers

Jim Wellcome, Conservation Manager, Cowlitz County PUD, recently complimented three BPA Mechanical Engineers.

"Chris Milan and Todd Amundson have provided us with technical support on

Industrial Projects that has been invaluable. Had it not been for their assistance on a number of projects we would not have been able to achieve the savings we did at such a low cost. They have also been very helpful in assisting with the training of our new Conservation Engineer, Corey Corbett. They have assisted us with the metering for measurement and verification of savings on a number of projects and have been able to include Corey in that process over the last few months, showing him the ropes. Consequently, Corey has gained a lot of valuable experience and received guidance from competent people such as Chris, Todd and Jack Callahan and others at BPA."

-- Submitted by Elly Adelman (503) 230-5052



BPA Search: Keywords - People - Organizations | BPA Kids



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Energy Education

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[Kid's Games](#)

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[Solar Water Heater Training - Installer](#)

Updated 3/18/03

Exhibit Request

Available to Northwest utilities served by Bonneville Power Administration

Below is a list of Energy Efficiency exhibits that are available reserve for energy-related events.

- Click on the exhibit desired and a request form will open.
- Fill out the form and click "submit".
- Someone will contact you within a business day regarding the availability of the desired exhibit.

Name/Description	Exhibi Photo
Solar Model Home -- Solar Model Home Exhibit with Lrg 3'x4' explanatory poster.	
Crank Power -- 4 to 5 pieces (requires minor assembly). Pedal power has been modified into Crank Power which allows short and tall people to volunteer to generate power required to light a bulb.	
Fuel Cell Videos or CD-ROM -- (3 or 8 minute) VHS or CD-ROM.	
Storyboard & Posters -- Fairchild AFB; Education Offerings; Lighting Materials; EE Programs & Initiatives. Requires either Velcro-friendly background or easels.	
Energy Efficiency Tips Brochure -- Tri-Fold brochure in English (green) or Spanish (yellow)	
Lighting Exhibits -- Energy usage and quality comparisons.	
Mr. Zippy -- Inflatable CFL, requires power outlet for motor and something to tie it down with.	
Save a Watt Marketing Materials -- Costume, banner, face masks, half-page flyer.	
Energy Web Diagram -- Poster	
Sustainability Photo Story -- Over 20 pictures of BPA achievements in sustainability including partnerships with customers. Photos need velcro-friendly display board.	

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Send feedback about the BPA EE web site to [EE Webmaster](#)

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July 2003

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Click on links below for more information, contact the person or group listed, or send an e-mail with your questions to [Calendar](#). Please send calendar items to that same address.

- 4 -- **Independence Day**
- 20-24 -- [APPA Economic Development & Utility Marketing Conference](#), San Francisco, CA. Contact: Heidi Lambert at (202) 467-2976.
- 25-27 -- [SolWest Renewable Energy Fair, John Day, OR](#)

August 2003

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

Click on links below for more information, contact the person or group listed, or send an e-mail with your questions to [Calendar](#). Please send calendar items to that same address.

- 20-22 -- [International Energy Program Evaluation Conference](#), Seattle, Washington.
- 23 -- Solar Power in the Northwest, Everett, WA.
Contact: Chris Fate, Snohomish County PUD (425) 783-8274
or send at e-mail to cdfate@snopud.com

September 2003

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

Click on links below for more information, contact the person or group listed, or send an e-mail with your questions to [Calendar](#). Please send calendar items to that same address.

- 1 -- **Labor Day**
- 14-17 -- Northwest Innovations and Communication Conference, Post Falls, ID. Information and Registration at www.nwppa.org/nic.html
- 18-21 -- [Northwest Renewable Energy Festival Link](#), Walla Walla, Washington



Non-Construction Alternatives – NCA

The Bonneville Power Administration launched a new initiative to ensure it is providing the most cost-effective solutions for the region's transmission needs. BPA's Transmission Business Line (TBL) is investigating how to fully and effectively integrate non-construction alternatives into its transmission planning process. The initiative has four elements, a roundtable of regional experts and interests, a set of studies to explore specific opportunities, development of screening criteria, and pilot activities.

This initiative expands on a 2001 study commissioned by TBL and prepared by the firm Energy and Environmental Economics, Tom Foley, and Eric Hirst. The report, *Expansion of BPA Transmission Planning Capabilities: A Report on Non-Transmission Alternatives*, recommended specific enhancements to BPA's transmission planning. Suggested enhancements included revisions to the planning process time horizon, specific and earlier consideration of NCA, and appropriate allocation of costs and benefits.

For more information on TBL's Non-Construction Alternatives initiative, go to the following link: www2.transmission.bpa.gov/Projects/NonWire/roundtable.cfm

BPA's Power Business Line Energy Efficiency (EE) group is providing technical and analytical support to TBL to examine the possibility of using energy efficiency programs, demand reduction initiatives, pricing strategies, and distributed generation to defer or avoid transmission system reinforcements/expansion. EE's expertise in conservation, demand management, and the EnergyWeb concept will be brought to bear on TBL's NCA challenge.

EE and TBL have jointly identified and selected three projects for preliminary screening during the next few months. If the preliminary screenings are positive, then a more detailed analysis will be performed to explore the logistics, effectiveness, and reliability of NCA as a potential non-wires solution. The three projects are: the Olympic Peninsula Reinforcement, southern Idaho transfers, and Lower Valley Energy Inc. service. These projects were carefully selected to explore solutions in winter and summer peaking situations, and a reasonable probability that NCA could work.

Pilot projects are currently being planned for fiscal year 2004 to be implemented, initially, on the Olympic Peninsula. The projects will gauge the effectiveness, institutional issues, and reliability of the various measures. The pilots will examine the use of load-control, peak load targeted efficiency, market based demand response initiatives, and distributed generation.

For questions or further information, contact David Le at 503-230-5298 or e-mail David at ntle@bpa.gov.



Energy EFFICIENCY

Bandon Tests Microturbine

As part of the City of Bandon's (Oregon) continuing effort to investigate ways of reducing utility costs, the City is testing a propane-fired microturbine, which is on loan from BPA. The City will use the 60-kilowatt generator for the next few months to provide base data regarding the feasibility and cost effectiveness of generating electricity using microturbine technology.

The microturbine is currently running at about two-thirds of capacity, feeding about 40 kilowatts into the City's electric grid. The unit is fueled with propane, since natural gas is not yet available. A natural gas main line will run to the City limits within the next two years, and could be a potential fuel source for meeting part of the City's future electrical power needs.



The City of Bandon tests BPA's Capstone microturbine at Oregon Overseas Timber. (Photo by Tammy Smith)

According to BPA mechanical engineer Todd Amundson, "The microturbine has run over 200 hours, providing approximately 8,000 kilowatt hours/year of electrical energy to the grid in little over a month of demonstration time." The microturbine is now located near Oregon Overseas Timber

BPA staff worked with City Manager Matt Winkel, electrician Dennis Bork, and conservation specialist Tammy Smith on the project.

-- Todd Amundson (503) 230-5491



Energy EFFICIENCY

BPA is in the Sustainability Business

BPA is serious about doing business in a sustainable way. Living sustainably means we each use natural resources no faster than they can be restored. Sustainability is the practical balance between the short-term human needs of humanity and the long-term needs of the planet. Future generations will benefit from sustainable choices we make today.

At BPA, we've always been proud of the clean hydropower that we market, but more and more, we're looking at the big picture (and the little details) of sustainable practices. Here are a few examples:

- BPA set up a comprehensive recycling program several years ago, and now we're going a step further by setting printer defaults to automatically print two-sided, reducing our paper usage substantially.
- When vegetation needs to be cleared under BPA transmission lines or along access roads, our maintenance crews carefully evaluate each line to minimize environmental impacts.
- BPA headquarters in Portland buys 5 percent of its electrical power from Pacific Power's Blue Sky wind power program, and we increased the energy efficiency of the building by 10 percent.
- BPA spends hundreds of millions of dollars each year on innovative fish and wildlife projects to mitigate the impacts of the hydro system.
- BPA renovated its Ampere Building in Vancouver, Washington, to Leadership in Energy and Environmental Design standards.





Approaching the Residential Loan Program

Bonneville Power Administration developed the Residential Loan Program in order to secure a stable source of funds for residential conservation that is not subject to volatile wholesale power market prices nor swings in regional load resource balance. Below are examples of approaches customers are taking when signing up or when integrating the loan program into their operations. The first set of examples illustrate ways customers are adding the program into their conservation program portfolio. The second example describes ways vendors are being approached to gain their interest in the program.

How Customer Utilities blend the Loan Program into their Operations

Optimizing limited utility funds – A cost-effectiveness approach

- Tacoma recently revised their overall programs and decided to use limited City funds (including City loans) for measure combinations that provide the most energy savings for their money.
- Tacoma adopted the loan program as a way to introduce third party funding for measures homeowners request that Tacoma no longer funds, such as replacement windows. The addition of the First Mutual loan to Tacoma's program provides vendors with a source of funds for efficiency measures to help them maintain their sales as part of the Tacoma program.
- Because First Mutual is fuel blind, the Loan Program also enables Tacoma to resolve a long-term customer service issue of not being able to provide conservation program services to customers with gas heat. While Tacoma can't give incentives to homes that are heated with gas, they can provide referrals to vendors who now have a competitive loan to offer homeowners.

More choices for vendors and homeowners

- Gray's Harbor adopted the Loan Program to give vendors and homeowners more choices for selling and installing energy efficient equipment.
- Gray's Harbor currently offers their customers a low-interest loan **or** an incentive for heat pumps. The First Mutual Loan is offered as an alternative source of funds in support of their program so homeowners can have both the First Mutual loan **and** the Utility incentive, if they choose.

Enhancing relationships with neighboring utilities and vendors

- Pacific County has been in the process of redesigning their conservation programs. Their close proximity to Gray's Harbor necessitates that they operate in the same vendor pool. After Gray's Harbor's vendor meeting, a vendor called Pacific to ask if they were participating in the Residential Loan Program. When BPA followed up with Pacific, they signed up for the program, making it easier for both Utilities and their local vendors to offer similar programs in neighboring service areas.

How Vendors are being Recruited into the Loan Program

BPA and First Mutual Assistance

- Orcas signed up for the program hoping to have the offering available for the summer remodeling season and home remodeling shows.
- They requested assistance with building the vendor list. BPA and First Mutual developed a draft list and sent it to Orcas for their review. Working with Orcas, First Mutual sent letters to vendors to see if they want to sign up. The next step is to follow up with one-on-one calls.

The Customer Takes the Lead

- Kootenai wanted to expand their conservation program offering.
- Kootenai developed the list of weatherization vendors and requested packets so they can mail invitations to vendors to sign up with First Mutual.

-- Mike Rose (503) 230-3601



WELCOME TO THE ENERGY TRUST!

The Energy Trust of Oregon, Inc., is a new nonprofit organization promoting clean energy. We invest in efficient technologies and renewable resources that save dollars, create jobs and protect the environment. We officially opened our doors on March 1, 2002, the day Oregon's electric energy restructuring law took effect. A provision of this law requires Oregon's two largest electric companies to collect a 3 percent public purpose charge from their customers. Under an agreement with the Public Utility Commission, the Energy Trust will receive most of these funds to invest in energy conservation and green power.

What purpose does the Energy Trust of Oregon fulfill?

We are here to fulfill the State of Oregon's vision to meet future energy needs through environmentally sound, clean energy sources. The Energy Trust's goals are, by 2012, to save 300 average megawatts through energy efficiency investments and to help meet 10 percent of Oregon's energy requirements through renewable energy sources. Our mission statement is:

"The Energy Trust changes how Oregonians produce and use energy by investing in efficient technologies and renewable resources that save dollars and protect the environment."

How was the Energy Trust created?

During the 1999 Oregon legislative session, utility companies, Oregon businesses and industries, and over one hundred community service organizations united in their interest to provide stable, consistent and reliable funding for energy efficiency and renewable power. Together they supported the passage of Senate Bill 1149, the electric industry restructuring bill of 1999. The law sets aside 3 percent of electric utility bills from Portland General Electric (PGE) and Pacific Power for "public purposes," including investments in energy efficiency and renewable energy projects. The Oregon Public Utility Commission authorized the Energy Trust to administer these programs.

What is the 3 percent public purpose charge?

As required by SB 1149, Portland General Electric and Pacific Power began collecting a 3 percent public purpose charge from their customers starting March 1, 2002. Nearly three-quarters of the public purpose funds go to the Energy Trust to be invested in energy conservation and renewable

energy. The remaining public purpose funds are managed outside the Energy Trust and directed to energy efficiency in schools (10%), low-income weatherization (11.7%), and low-income housing (4.5%).

How does the Energy Trust operate?

The nonprofit Energy Trust is run efficiently with a small staff and streamlined operations. We conduct business largely through contracts with service providers. We are open and accessible to the public.

How is the Energy Trust different?

The Energy Trust brings predictability and stability to energy conservation and renewable energy programs. In the past, funding levels for conservation, mainly offered through utilities, have varied. The added certainty about the availability of programs will help consumers and energy-related businesses plan wisely.

What are the benefits of energy efficiency and renewable energy?

Investments in energy conservation and renewable power give businesses a competitive edge and boost local economies, and help customers save on their electric bills and choose clean energy sources. By using energy efficient equipment and processes, Oregon commercial, industrial and agricultural enterprises can save energy and increase productivity – creating more jobs and keeping dollars circulating in local economies.

When will programs begin operating?

The Efficient Buildings Program for existing commercial and industrial facilities began on February 1, 2003. The Efficient Homes Program launches March 1, 2003. Programs for new commercial buildings and industrial processes will begin on May 1, 2003. The New Homes Efficiency Program will begin September 1, 2003. Renewable energy production, such as solar water heaters for homes, will be offered to customers through our efficiency programs. Large-scale renewable generation projects are already underway.

What will happen to PGE and Pacific Power conservation programs?

During a period of transition through the middle of 2003, the utilities will continue conservation programs with Energy Trust support. During the spring and summer of 2003, the Energy Trust will launch its own programs. The utility programs will phase out as Energy Trust programs are launched.

How do I participate in Energy Trust programs?

Customers interested in receiving services should call our toll-free number at 866-ENTRUST, or visit our website at www.energytrust.org for more information. Trade allies interested in providing services and businesses interested in large-scale renewable energy projects should contact the Energy Office directly at 503-493-8888.

What programs are available for large electricity users?

Current law permits industrial customers using at least one average megawatt of electricity to invest their public purpose charge in energy efficiency and renewables resources for their facilities. Large businesses can also choose to contribute to the public purpose fund and receive Energy Trust services. Businesses interested in self-direction need to be certified by the Oregon Office of Energy (www.energy.state.or.us/sb1149/Business/self-direct.htm).

Will the Trust encourage innovation?

The Energy Trust seeks to encourage new and innovative approaches that assure high levels of cost-effective energy savings for utility customers. Above-market costs of renewable energy projects are eligible for support and will stimulate long-term market growth for renewable energy. The Energy Trust does not invest directly in bringing new technologies to market or in research and demonstration projects.

Where do I find more information?

The Energy Trust web site www.energytrust.org is updated several times each week. Program information is posted there, along with public meeting schedules and other information about our activities. Our strategic plan, action plan, and other documents are also available. As the Energy Trust moves forward, we will create more links from our web site to energy-saving programs throughout the state. Because of our small staff, we encourage you to communicate with us by e-mail at info@energytrust.org or call our toll-free number at 1-866-ENTRUST.

The Energy Trust of Oregon is helping to build our energy future.

The Energy Trust is a promise to Oregonians that we will meet our energy needs in innovative, safe, clean and efficient ways. Our success will be measured in kilowatt-hours saved and in renewable energy produced by programs that match our values and commitment to sustain our natural resources. As an independent nonprofit overseen by a citizen board the Energy Trust will help create the energy-independent and environmentally sound future Oregonians desire.

February 7, 2003

Tacoma Power Cool Rebates

Tacoma Power is one of the first utilities in the country to offer its commercial customers rebates when they purchase Energy Star™ and SuperSaver commercial refrigerators and freezers. The rebates program began in late June.

“The most efficient commercial refrigerators and freezers use less than half the energy of standard units, but you have to know which ones to buy. Through our program we provide rebates for the most efficient refrigerators and freezers,” said Mark Aalfs of Tacoma Power.

Rebates are available to customers who purchase reach-in solid-door refrigerators and freezers that meet federal Energy Star energy performance criteria or better. Rebates range from \$30 to \$200 depending on the size of the unit and its efficiency. The largest rebates are offered for the most efficient units, which are designated as SuperSavers. The equipment must be installed and used in Tacoma Power’s service area. Glass-door units, vending machines, ice makers, beverage merchandisers, and walk-in refrigerators and freezers are not eligible.

Additional information about the Cool Rebates program is available from Tacoma Power at 253-502-8619, by e-mail to power@cityoftacoma.org and on the Web at www.tacomapower.com.



What is PTCS?

Performance Tested Comfort Systems (PTCS) is a trade-marked quality assurance brand developed by the Northwest Energy Efficiency Alliance (Alliance), technically supported by the Regional Technical Forum, and non-exclusively licensed to Climate Crafters, Inc.

The label, provided by a trained and certified installer, is a homeowner's assurance that the HVAC system has been optimized and actually tested to provide energy efficiency and comfort. That certification is registered with an independent third party to allow for follow-up quality control checking on a sampling basis. Actual performance field testing, combined with independent oversight, documentation verification, and on-site quality control is a powerful program model that has been evaluated and is the basis of EPA's decision to allow a Northwest Builder Option Package, based on this system for ducts, house tightening, and heat pump installation and commissioning. Fully 60 percent of the Power Planning Council's identified residential energy savings over the next 20 years depends on a PTCS testing and independent certification model.

How it works.

1. The Alliance grants license to Climate Crafters (CC) or others.
2. CC provides training for a fee to HVAC installers, Weatherization contractors or others, such as utilities, which want to be authorized to perform the work and carry out testing. There is currently only one type of training given and one type of graduate certificate.
3. Trained and certified installers do a pre-test, improve the systems, and test actual results -- often looping back to more improvements and final testing.
4. PTCS training graduates ("Certified Installers") installer/utility gives the homeowner the PTCS certificate and sends a copy to CC with a \$25 registration fee.
5. CC performs site visits and re-testing of a sub-sample of registered systems to provide quality control, identify remedial training opportunities, and work with contractors to constantly improve.
6. CC's quality control "inspectors" are actually the PTCS trainers -- Manclark, Hales, etc.
7. The sampled QC inspections by CC do not affect any prior BPA payments or credits; their purpose is to follow-up to make sure the training is being fully applied in the field and the customer is getting a service with long-lasting value.
8. As with any certifying program, consistent failure to properly achieve the PTCS quality can result in the entity that submits substandard jobs to lose its authority to certify.

PTCS currently involves two services: *duct sealing* and *heat pump installation*.

Ducts: In the situations where any utility has taken the PTCS training and purchased the same duct testing equipment as the traditional HVAC service providers, they can provide a PTCS certificate and register the completed system with CC for the same \$25 fee. This allows them to operate programs where there are insufficient certified installers by working interactively with the best available installers to test the duct systems (although usually not before the service is provided). Although the utilities have taken the hands-on training, they usually do not compete with their local contractors in providing the PTCS duct tightening work themselves.

Heat pump installation: PTCS heat pump installations require equipment commissioning by PTCS trained HVAC contractors as well as duct sealing. This requires additional special testing equipment and training. There are currently so few contractors or utilities with the specialized equipment and training that PTCS heat pump installation is a service, currently listed in the RTF measures list, that can best be seen as a “stretch” measure at the current time.

Roles:

Alliance – owns and manages trademarked PTCS services.

Regional Technical Forum – manages technical support and research; determines changes to the specifications and determines “equivalency” to the PTCS specifications. (Independent third-party quality control is a PTCS specification.) RTF establishes energy savings values for PTCS and recommends credit levels to BPA for the Conservation & Renewables Discount program.

Climate Crafters – trains and certifies HVAC installers and others to perform the PTCS services and ensures quality control through independent spot checking of registered systems, using the CC PTCS trainers.

BPA – approves, modifies, or rejects recommendations from the RTF. BPA does not control PTCS specifications.

Utilities – provide Conservation Augmentation rebates, their own utility reimbursement, or C&RD incentives to homeowners who establish that they have a PTCS certified system. Some trained and equipped utilities may choose to perform quality control and send in the PTCS registration forms themselves, as noted above.

-- Ken Keating (503) 230-5857



Wave Energy

Technology

Generating technologies for deriving electrical power from the ocean include tidal power, wave power, ocean thermal energy conversion, ocean currents, ocean winds and salinity gradients. Of these, the three most well-developed technologies are tidal power, wave power and ocean thermal energy conversion. Tidal power requires large tidal differences, which in the U.S., occur only in Maine and Alaska. Ocean thermal energy conversion is limited to tropical regions, such as Hawaii, and to a portion of the Atlantic coast. Wave energy has a more general application, with potential along the California coast. The western coastline has the highest wave potential in the U.S.; in California, the greatest potential is along the northern coast.

Wave energy conversion takes advantage of the ocean waves caused primarily by interaction of winds with the ocean surface. Wave energy is an irregular and oscillating low-frequency energy source that must be converted to a 60-Hertz frequency before it can be added to the electric utility grid.

Although many wave energy devices have been invented, only a small proportion have been tested and evaluated. Furthermore, only a few have been tested at sea, in ocean waves, rather than in artificial wave tanks.

As of the mid-1990s, there were more than 12 generic types of wave energy systems. Some systems extract energy from surface waves. Others extract energy from pressure fluctuations below the water surface or from the full wave. Some systems are fixed in position and let waves pass by them, while others follow the waves and move with them. Some systems concentrate and focus waves, which increases their height and their potential for conversion to electrical energy.

A wave energy converter may be placed in the ocean in various possible situations and locations. It may be floating or submerged completely in the sea offshore or it may be located on the shore or on the sea bed in relatively shallow water. A converter on the sea bed may be completely submerged, it may extend above the sea surface, or it may be a converter system placed on an offshore platform. Apart from wave-powered navigation buoys, however, most of the prototypes have been placed at or near the shore.

The visual impact of a wave energy conversion facility depends on the type of device as well as its distance from shore. In general, a floating buoy system or an offshore platform placed many kilometers from land is not likely to have much visual impact (nor will a submerged system). Onshore facilities and offshore platforms in shallow water could, however, change the visual landscape from one of natural scenery to industrial.

The incidence of wave power at deep ocean sites is three to eight times the wave power at adjacent coastal sites. The cost,



however, of electricity transmission from deep ocean sites is prohibitively high. Wave power densities in California's coastal waters are sufficient to produce between seven and 17 megawatts (MW) per mile of coastline.

As of 1995, 685 kilowatts (kW) of grid-connected wave generating capacity is operating worldwide. This capacity comes from eight demonstration plants ranging in size from 350 kW to 20 kW. None of these plants are located in California, although economic feasibility studies have been performed for a 30 MW wave converter to be located at Half Moon Bay. Additional smaller projects have been discussed at Fort Bragg, San Francisco and Avila Beach. There are currently no firm plans to deploy any of these projects.

Q. What are anticipated costs of ocean wave energy?

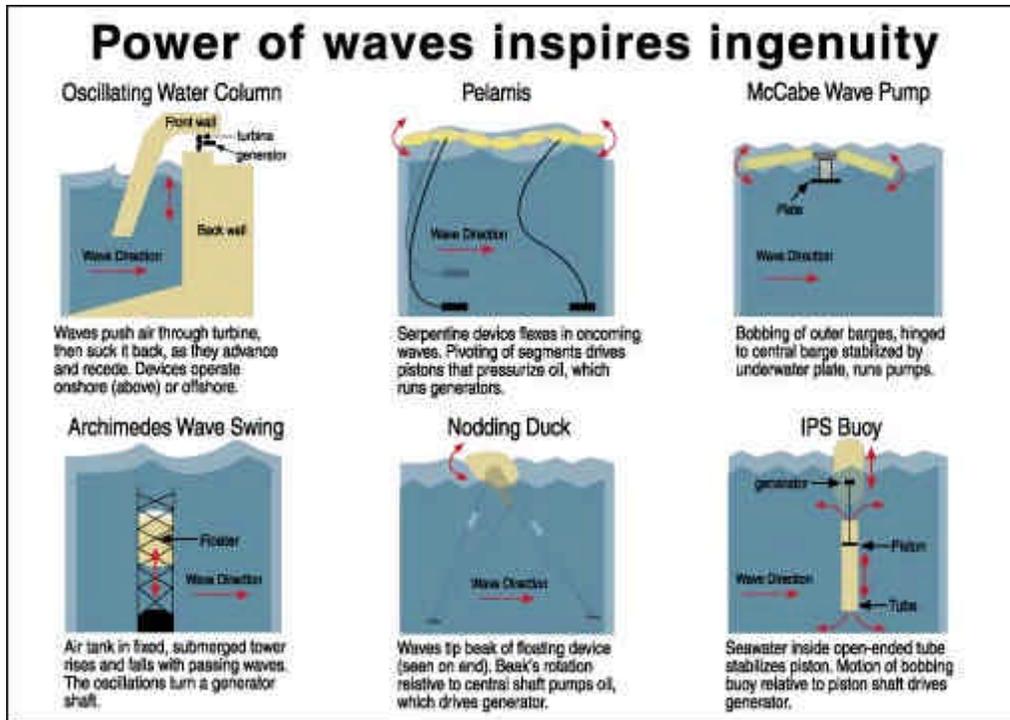
A. It has been estimated that improving technology and economies of scale will allow wave generators to produce electricity at a cost comparable to wind-driven turbines, which produce energy at about 4.5 cents kWh.

Q. What are some of the devices for ocean energy conversion?

A. There are three basic methods for converting wave energy to electricity:

Float or buoy systems that use the rise and fall of ocean swells to drive hydraulic pumps. The object can be mounted to a floating raft or to a device fixed on the ocean floor. A series of anchored buoys rise and fall with the wave. The movement

"strokes" an electrical generator and makes electricity that is then shipped ashore by underwater power cable



Oscillating water column devices in which the in-and-out motion of waves at the shore enter a column and force air to turn a turbine.

The column fills with water as the wave rises and empties as it descends. In the process, air inside the column is compressed and heats up, creating energy the way a piston does. That energy is then harnessed and sent to shore by electrical cable.

"Tapered channel" or "tapchan" systems, rely on a shore-mounted structure to channel and concentrate the waves, driving them into an elevated reservoir. Water flow out of this reservoir is used to generate electricity, using standard hydropower technologies.

Q. *Why ocean wave energy?*

A. With acknowledgement to [Capital Technology, Inc.](#) "While lagging behind wind and solar in commercial development, ocean wave power is a more promising resource than either:

1. Because waves originate from storms far out to sea and can travel long distances without significant energy loss, power produced from them is much steadier and more predictable, both day to day and season to season. This reduces project risk;
2. Wave energy contains roughly 1000 times the kinetic energy of wind, allowing much smaller and less conspicuous devices to produce the same amount of power in a fraction of the space;
3. Unlike wind and solar power, power from ocean waves continues to be produced around the clock, whereas wind velocity tends to die in the morning and at night, and solar is only available during the day in areas with relatively little cloud cover;
4. Wave power production is much smoother and more consistent than wind or solar, resulting in higher overall capacity factors;
5. Wave energy varies as the square of wave height, whereas wind power varies with the cube of air speed. Water being 850 times as dense as air, this results in much higher power production from waves averaged over time;
6. Estimating the potential resource is much easier than with wind, an important factor in attracting project lenders;
7. Because wave energy needs only 1/200 the land area of wind and requires no access roads, infrastructure costs are less;
8. Wave energy devices are quieter and much less visually obtrusive than wind devices, which typically run 40-60 meters in height and usually requiring remote siting with attendant high transmission costs. In contrast, 10 meter high wave energy devices can be integrated into breakwaters in busy port areas, producing power exactly where it is needed;
9. When constructed with materials developed for use on off-shore oil platforms, ocean wave power devices (which contain few moving parts) should cost less to maintain than those powered by wind.

Even though wave energy is at the very beginning of the manufacturing learning curve, capital costs per net kw are already down in the range of wind energy devices, and below solar. In areas of higher power costs, such as diesel-based communities not connected to the grid, investment returns from wave energy projects are potentially very attractive. In 1909, ocean wave power was used to

light lamps on the Huntington Beach Wharf until a storm carried the apparatus out to sea. Long-term reliability of the OWC technology has now been demonstrated, with one device in India still going strong after 10 years of continuous operation."

Wave energy power plant located offshore. The energy converters consist of floating buoys moored in water 150 to 200 feet deep, several miles off shore. The wave action moves the buoy up and down, which in turn creates a pumping action, producing pressurized seawater that then is directed into a turbine driving a conventional electrical generator.

Feasibility

Clallam County PUD and the Makah Nation have initiated a 1 megawatt demonstration project. The offshore power plant will consist of several buoys contained within a surface area of 260 x 130 feet and generate a yearly output of 1.6 gigawatt-hours. The cost of the Makah demonstration power plant is projected to be \$1.5 to \$2 million.

Once developed on a commercial scale, large offshore power plants (over 100 megawatts) installation costs are projected to be competitive to the co-generation plants, with operational costs on par with the hydroelectric power production.

-- Kevin O'Sullivan (503) 230-3693

<http://www.jobs.bpa.gov/mira.htm>



Mira Mechanical Engineer & Fuel Cell Program Manager

As BPA's Fuel Cell Program Manager, I have the opportunity to affect our grandchildren's future. Because fuel cells generate efficient, environmentally friendly electricity, they have the potential for making the world more sustainable. Fuel cells generate electricity through an electrochemical reaction between hydrogen and oxygen, creating water vapor as the only pollutant.



I work on BPA's Energy Efficiency Team where our goal is to promote energy conservation and renewable resources. The team I work with tests fuel cell prototypes to identify ways to make them more practical, reliable and affordable. As a mechanical engineer and project manager, on any given day I might be in my office in Portland evaluating energy conservation proposals for businesses and industries, managing a contract or approving invoices; I might be out in the field inspecting a photovoltaic system, commissioning a building's chiller or metering electricity use, or I may be out talking about fuel cells at conferences, schools and with people who have questions

about fuel cells.

Most people don't imagine a Federal project manager on a roof wearing a hard hat, but that's where I was today. Most days though, I'm in my office in northeast Portland, Oregon. I may spend a lot of time on the phone and computer, but what I like best is the variety.