SOLAR RISING

July 2000 **Volume 3, Issue 3**

Quarterly Newsletter of the Oregon Solar Energy Industries Association (OSEIA)

Bringing you tomorrow's sustainable energy technologies today!

Pacific Northwest Governors Proclaim July as Solar Awareness Month

Governor Kitzhaber Proclaims July as Solar Awareness Month

Governors of Oregon, Idaho, Washington, and Montana Agree – Solar development makes good economic and environmental sense. The governors of the four northwestern states have announced that July 2000 is solar awareness month to show support for the companies and consumers who invest in clean solar energy.

World markets for clean energy and technological advances have spurred annual increases in solar electric power (photovoltaics) by more than 25% per year over the last 6 years.

The World Bank estimates that over the next 35 years global demand for new electric energy resources will more than double. Regions that develop the skills and local markets for solar energy will best be able to capitalize on this market. Providing electric power for the world represents a market tens of times larger than the computer industry. One third of the world's population, equal to six and a half times the population of the USA, lives without electricity. We can choose to be the providers of clean renewable energy technologies or wait for someone else.

Solar awareness month was brought about by the efforts of the Northwest Solar Alliance (NSA) to educate the public on the value, uses, and future of solar electricity. In 1999, Idaho held a solar awareness week. Building on Idaho's initial effort, NSA members in Oregon, Washington, and Montana have joined with Idaho to create a regional solar awareness month. The NSA newsletter on solar awareness month is available from the Oregon Office of Energy or a pdf copy can be downloaded at http://solardata.uoregon.edu/html/pdf.html.

Grants Pass Solar Bicycle Charging Station

by Ray Ogden

Energy Outfitters of Cave Junction and The Solar Man Company of Grants Pass donated this rack and charging station to the city of Grants Pass, Oregon. The idea is to encourage the use of alternative forms of transportation. If we provide an incentive by supplying free fuel for their electric bicycles and scooters maybe we can get some people to leave their cars at home when visiting downtown Grant Pass. So, we have incorporated a 100 watt solar panel into

(Continued on page 8)

Solar Bicycle Charging Station—Grants Pass, Oregon

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SOLAR RISING is the newsletter of the Oregon Solar Energy Industries Association (OSEIA). OSEIA is Oregon's local chapter of the Solar Energy Industries Association. The information presented in this newsletter reflects the opinions of the authors and not necessarily those of OSEIA.

The success of the newsletter depends upon your contributions. This is an opportunity to tell the OSEIA members about your activities and to express your opinions. Photographs or figures to accompany articles are most appreciated. Articles of current and timely interest will be given highest priority. Otherwise, articles will be published on a first come basis as room allows.

Send your contributions to:

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Eugene, Oregon 97403-1274
Phone: (541) 346-4745
Fax: (541) 346-5861
Email: fev@darkwing.uoregon.edu

Recognition should be given to Jennifer Barker, Christopher Dymond of OOE, Chris Eames of Energy Service Company, Ray Ogden of Energy Outfitters, and Tom Ullmann City of Portland for their contributions to the newsletter.

OSEIA Meeting Agenda

Senior Center
John Day, Oregon
Friday, July 28th, 2000

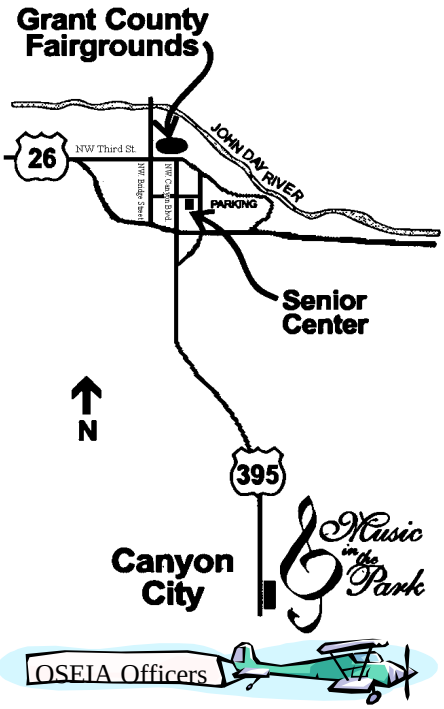
OSEIA Meeting
3:00 pm—6:00 pm

1. Welcome and Introductions: F Vignola
2. Approval of Minutes: Chris Eames
3. Treasurer's Report: Ray Pokorny
4. OSEIA Corporate Status: Ray Pokorny
5. OSEIA Bylaws: Ray Pokorny
6. Solar Licensing David Parker
7. OSEIA Brochure: Ray Pokorny
8. OOE Programs: Christopher Dymond
9. Solar Tax Credit: John Patterson
10. New business:

There will be a networking dinner Friday Evening July 28th at 6:30 pm at the Senior Center. The price of the dinner is $8 for those who are not making presentation or holding workshops. For more information, contact SolWest/EORenew at (541) 542-2525.

The Senior Center is on NE First Street (See MAP). NW Third Street goes to the Fair Grounds from HWY. 26. N. Canyon Blvd. runs north from 395.

Directions to John Day Senior Center



OSEIA Officers

President: Frank Vignola
Univ. of Oregon Solar Energy Center
Ph: (541) 346-4745

Vice President: Doug Boleyn
Cascade Solar Consulting
Ph: (503) 655-1617

Secretary: Chris Eames – Energy Service Company, Ph: (541) 302-6808

Treasurer: Ray Pokorny – Solar Interior Design, Ph: (503) 224-2322

OSEIA Member	Contact	Phone Number	OSEIA Member	Contact	Phone Number
Heliodyne, Inc	Bieri	(510) 237-9614	Oregon Conservancy Foundation	Marbett	(503) 637-6130
Cascade Solar Consulting	Boleyn	(503) 655-1617	Energy Outfitters	Maynard	(541) 592-6903
Solar Design & Construction	Bortz	(541) 753-8725	Solar Depot	Mizani	(916) 381-0235
Bobcat and Sun Construction	Claridge	(541) 389-7365	Read Goods Trading Company	Musser	(541) 334-6962
Mainline Electric	Cordeiro	(541) 535-9862	Mr. Sun Solar	Patterson	(503) 245-3722
Solar Collection, Inc.	Dawson	(541) 535-5364	Home Power	Perez	(530) 475-3179
Oregon Department of Energy	Dymond	(800) 221-8035	Solar Interior Design	Pokorny	(503) 224-2322
Energy Service Co., The	Eames	(541) 302-6808	Sun Earth, Inc	Reed	(909) 605-5610
SolarTech	Elliot	(541) 545-3201	Stellar Processes	Robison	(503) 827-8336
Gen-Con, Inc.	Gunderson	(503) 245-7657	Emerald PUD	Savage	(541) 744-7448
Sunlight Solar Systems	Israel	(888) 787-6527	Eastern Oregon Solar Electric	Slater	(541) 576-2478
Oregon Solar and Water	Johnson	(541) 344-1594	EWEB	Spiek	(541) 484-1125
Solar Energy Solutions	Koyaanisqatsi	(503) 238-4502	Summers Solar Systems	Summers	(541) 683-4014
Renewable Energy, Inc.	Larson	(503) 287-4777	U. of O. Solar Monitoring Lab.	Vignola	(541) 346-4745
Solar Assist	Loken	(541) 338-4957	City of Ashland	Wanderscheid	(541) 552-2061

Calendar of Events

For an up to date listing of events check the following website:

http://www.energy.state.or.us/solaware/solaware.htm

July 4-7th	Solar Library Tour—Eastern Oregon
July 7-8th	Energy Village Oregon Country Fair
July 7-8th	Idaho Renewable Energy Fair—Coeur D'Alene
July 8th	Solar in Seattle Conference
July 12th	Solar Library Event—Salem
July 14-15	PV installation workshop GSA bldg.—Auburn WA
July 14th	Photovoltaics High School Saturday Academy Class—Newberg
July 15-16th	Oregon Zoo—Remote Solar Display /w kids toys
July 20th	Solar Library Event—Ashland
July 21st	Solar Library Event—Klamath Falls
July 20-22nd	Solar Days @ WA PUD Annual Meeting
July 23rd	Solar Home Energy Workshop—Bend, Central OR Environmental Center
July 24th	Solar Hot Water Workshop for Homeowners and Builders—Hillsboro
July 24th	Portland Lunchtime Solar Event—Pioneer Square
July 26-28th	Grid-tied PV Systems Workshop—John Day
July 26th	Solar Buildings Presentation—Central Multnomah County Library
July 28th	Ashland Solar Utility Ribbon Cutting
July 28th	OSEIA quarterly meeting—John Day Senior Center
July 29-30th	SolWest Renewable Energy Fair—John Day
Aug 2nd	Photovoltaics Interconnection Workshop—Portland
Aug 3-4th	BPA Electric Revolution Conference—Portland
Aug 14-17	Remote PV Design Workshop—Eugene
Sept 11-15th	Solar Utility Tour—Umatilla, Redmond, Eugene, Portland, Tillamook
Sept 12th	MSR Financing Workshop—Seattle
Sept 28th-29th	Northwest Green Summit—Seattle
Oct. 14th	Oregon Solar Home Tour—Portland, Bend, Eugene
Oct 17-20th	Utility Solar Summit III—Winthrop Washington

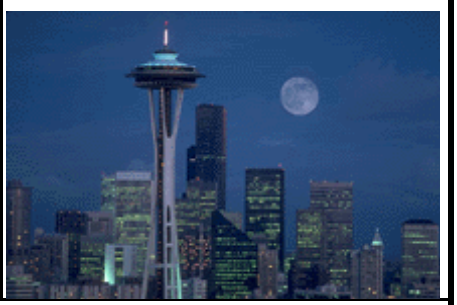
Northwest Green Power Summit

September 28th & 29th
Sea-Tac, WA

The Northwest Green Power Summit is scheduled for the end of September in Seattle, Washington. The purpose of this meeting is to bring together key members of the renewable energy and green power industry with government agencies to launch new federal renewable energy initiatives and develop partnerships and opportunities for facilitating green power purchases and renewable energy projects in the region.

Those in attendance will represent federal, state and local government agencies, green power marketers and developers, electric utilities, and green power advocates in the Pacific Northwest from Alaska to Washington.

The first day of the conference will be devoted to DOE renewable energy initiatives and regional strategies, green power marketing including wind, geothermal, solar and biomass, and utility green power programs. The second day of the conference will concentrate on Renewable and Green Power Government Procurement Strategies.



Electric Revolution: The Energy Web with Trade Show August 2-4, 2000 at the Portland Convention Center

For more information contact:

Sharon Doggett of BPA
Phone: (503) 230 5478
Email: sldoggett@bpa.gov

OSEIA Meeting, Tuesday April 11, 2000
Oregon Office of Energy, Salem, OR

by Doug Boleyn

Members Present: Frank Vignola, Ray Pokorney, Andy Bortz, Joe Savage, Don Spiek, Jon Biemer, Elly Adelman, Andrew K., Kelley Dancer, Wendy (Johnson) McCullough

Meeting was called to order by President Frank Vignola.

Treasurer's Report: was accepted.

Corporate Status: Ray Pokorney volunteered to assist Doug Boleyn in getting OSEIA Corporate Status and Bylaws done. No progress had been reported to date.

Budget: Is not determinable until Corporate status has been settled.

Newsletter: Frank reported that he is sending copies of the OSEIA newsletter to all legislators. He also reported that the newsletter cost $258.45 for the last printing. Joe Savage volunteered to assist Frank to mail OSEIA newsletters from now on. Don S. moved, and it was seconded, that $50 be provided per quarter to pay for labor to stamp, seal, and send newsletters. Frank can decide how best to spend the funds. This motion was passed unanimously.

Brochure: No progress to date. Ray will bring layout of brochure at next meeting.

Doug Boleyn gave a short report on the Ashland 25kW solar project.

Christopher Dymond reported that three calls per week are coming in for solar information - this is up from one call per month.

Christopher reported that OOE is offering $50 credits to OSEIA-sponsored trainees for the Ashland training sessions on June 5-6-7. The total cost is $250 for attendees. Christopher will Email and mail brochures to all OSEIA members and electrical contractors. Training will be given by Bill Brooks, of PVUSA.

Solar Tax Credit Committee: Frank asked for volunteers to serve as committee chair and personnel. They will: 1) work with RNP; 2) get together with legislators; 3) help get right persons informed. Tax credits phase out at end of 2002. Discussion on how to lobby and key issues in solar tax credit ensued. Easier pass-through of tax credits to schools and other public buildings was discussed. Discussion on whether to hire a professional lobbyist. Tom Novick's name as potential lobbyist was mentioned. The idea to solicit committee members by Email after this meeting was agreed to. John Patterson as potential name. Andy Bortz was assigned to talk to David Parker, John Patterson, and Richard Perez regarding leadership for lobbying effort this year.

At this point, John Patterson came in the room to the group's cheers, and accepted leadership of the lobbying effort for year 2000 and 2001. Andrew K., Andy B., David Parker, Kelley D. all volunteered to help John.

Frank announced that he has accepted the position as Chapter's Representative of SEIA National Board. He also announced that John Patterson will officially represent OSEIA at the Soltech Conference in Washington DC in April 20.

Other Announcements: Frank passed out SolWest Fair brochures for the Fair July 28-30 in John Day. He also mentioned that Montana is forming up a Solar Alliance.

Christopher Dymond/OOE Report:

- is putting together pictures for the State - has 100 MB of pictures and is compiling solar photos.
- reported that the 1-800 number for OSEIA goes to the OOE office. He responds with SDHW packet or soon-to-be-produced PV info packet.
- OOE will sponsor 10 OSEIA-sponsored @ $100 per head for the Ashland PV workshop
- OOE has issued first remote PV system buydown @ $1300 in Prineville
- announced that July, 2000 will be declared Solar Awareness Month.
- reported that SB 1149 (the Restructuring Bill) created System Benefit Charges, the renewables portion of which will be about $7 million per year to use for above-market costs of green energy. OOE will set up a non-profit office that will buy and sell green power credits, and is applicable to new renewables.
- discussed different options for SB1149 Restructuring funds for distributed renewables.

Next meeting: John Day Senior Center at SolWest Fair, July 28 at 3-6pm

Ready to power up. Photo ESCO

Million Solar Roofs Seattle Region Workshop on Solar Finance

Million Solar Roofs Seattle Region Workshops on Solar Finance will be held September 12th, from 9:00 a.m. to 4:00 p.m. at the DOE Seattle Regional Office, Puget Sound Room #3950 in Seattle, Washington. To register or for more information contact Curtis Framel by phone at (206) 553-7841

Lane County Passes July Solar Awareness Month Resolution

On July 5, 2000, the Lane County Board of Commissioners unanimously passes a resolution supporting July as Solar Awareness Month. While regional efforts are very important, local support for educating the public about solar opportunities is essential.

Think globally, act locally.

New DOE/Seattle MSRI contact

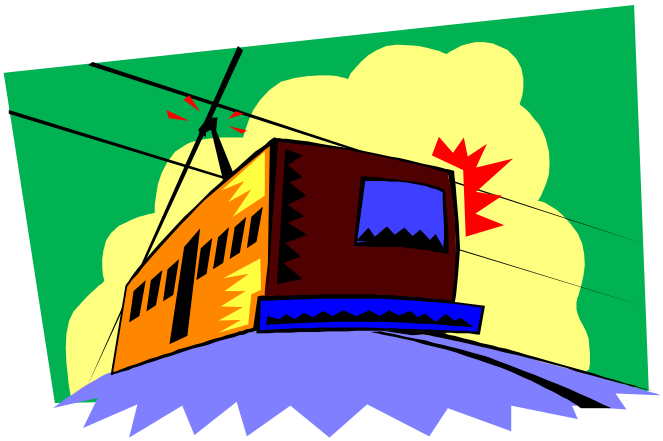
Heather Mulligan, who has published the MSRI email newsletter and coordinated the MSRI registry is now working out of the Seattle regional office and will be the MSRI coordinator for the western region. We look forward to the new energy and expertise that Heather Mulligan brings to the job.

David Douglas H.S. "DDX" Hybrid Solar Powered Light Rail Train Project Seeks Donations to Meet PGE Challenge Grant

Contact:
Tom M. Ullmann, City of Portland/ Bureau of Maintenance, 823-1755
Jeanne Yerkovich, David Douglas High School, 261-8339

Portland, March 31, 2000 -- The David Douglas Express (DDX) Hybrid Solar Powered Lightrail Train Project, that will transport physically challenged students across the campus, has been awarded a challenge grant of up to $5,000 from Portland General Electric (PGE). The $5,000 will match money donated from City of Portland employees, David Douglas High School students and parents and the general public.

The City of Portland/Bureau of Maintenance is partnering with David Douglas High School to provide assistance in development of solar and wind generated power for the DDX. Since 1996, David Douglas High School has partnered with community members, local businesses and organizations on the project, believed to be the only light rail system in the United States designed and built by high school students. The DDX has been funded by donations of cash, equipment and materials, including $ 1,000 from the League of Oregon Cities, awarded in July 1999 which supports a "Livable Oregon Community Project."



The David Douglas Express train, track and station are in the final stages of completion. When completed, the DDX will transport students in a safe and timely manner between the high school's two main buildings, more than twice the length of a football field one way. The last phase for the student-run project is to power the train with renewable energy. Students in the Industrial and Engineering Systems Certificate of Advanced Mastery Program (CAM) are learning the newest technology and real life skills as they learn to power the train with wind generators (60%) and photovoltaic panels (40%).

Project funding must be through donations, as negotiated by the students in an agreement with the David Douglas School Board. Tax deductible donations are being sought to support this educational, environmentally friendly and handicapped accessible project. On your donation check, please write "DDX PROJECT" / Acct.# 276820.

Mail donation checks to:

David Douglas High School, 1001 SE 135th Ave., Portland, OR 97233, Attn: Jeanne Yerkovich

or, PACE Credit Union, 3010 SE Belmont, Portland, OR 97214, Attn: DDX Project Account

SolWest Renewable Energy Fair—2000

SolWest Fair for 2000: July 29-30 at the Grant County Fairgrounds, John Day, Oregon

Workshops

This year, SolWest presents a good lineup of workshops on practical topics and issues. For details, call the office at 541-575-3633, and we will send you the printed schedule with workshop descriptions.

Power Production, Storage, and Monitoring

1. How to Design Your Power System: Rick Nuessle. Saturday 11:00
2. Fundamentals of Photovoltaics: Tom Bishop. Sunday 11:00
3. Batteries for home power systems: Richard Perez. Sunday 2:00
4. Solar charge controllers: Rick Cullen. Sunday 9:30
5. Installing PVs on a Trailer: Ray Ogden. Saturday 9:30
6. Inverters 101 (Basic): Sam Vanderhoof, Von Kalanquin and Tobin Booth. Saturday 3:30
7. Inverters 102 (Advanced): Sam Vanderhoof, Von Kalanquin and Tobin Booth. Sunday 3:30
8. Steve Willey is "Mister Fixit": Steve Willey. Saturday 2:00
9. Tour of a Wood-fired Commercial Generating Plant: Noelle Colby-Rotell. Saturday 10:30
10. Wind Power: David Sears. Sunday 11:00
11. Fuel Cells: Larry Elliott. Saturday 3:30

Land and Water

12. Solar Water Pumping: Windy Dankoff. Saturday 2:00, Sunday 2:00
13. Pump Water with Sun, Flowing Water, and Livestock as Power Source: Phil Glass. Sunday 9:30

Shelter and Heating

14. Simple Solar Water Heating: Anthony Stoppiello. Saturday 11:00
15. Basics of Passive Solar Building Design: Anthony Stoppiello. Sunday 9:30
16. A Golden Thread: 2500 Years of Solar Architecture and Technology: John Perlin. Saturday 9:30
17. Solar in the Northwest: John Patterson. Saturday 2:00
18. Energy Efficiency: Only About Dollars? Mike O'Brien. Sunday 2:00

Living Skills and Finances

19. Design and Construction of Food Producing Greenhouses: Tom Wykes. Sunday 3:30
20. "Living with Solar" Panel Discussion: Jerry Igo, Jennifer Barker, John Philip, Kay Firor. Saturday 5:00
21. Solar Cookery: Jennifer Barker. Sunday 11:00
22. Passive Solar Design tax credits: Christopher Dymond. Sunday 3:30
23. State Energy Programs: Christopher Dymond. Saturday 3:30
24. Remote PV Rebate program: Christopher Dymond. Saturday 9:30

Travel and Transportation

25. A Practical Example of a Biodiesel Powered Vehicle: Jon Kenneke. Saturday 5:00
26. RV Solar Camping: How to outfit your RV with solar. Never plug in again! Phil Wilcox. Saturday 11:00

Issues, and Technology

27. Alternative Energy: Expectations and Reality: Charles Woodward. Saturday 2:00
28. 'Turning Your Utility Meter Backwards - Oregon's Net Metering Legislation' and Utility restructuring: Frank Vignola, Peter West. Saturday 9:30
29. Designing for Remote Sites: Dennis Ramsey. Saturday 11:00
30. The Energy Web; Distributed Generation and a Vision of the Future: Elly Adelman. Saturday 11:00
31. Jobs in Renewables: Michael Hackleman. Saturday 5:00
32. Computers and Alternative Power: Jon Kenneke. Sunday 2:00
33. In the Trenches with Your Web Site: James M. Houser. Saturday 5:00

Solar array and solar cooker at SolWest 99. Photo courtesy of Christopher Dymond of the Oregon Office of Energy.

Camping at the Fair

Camping is available right on the fairgrounds for both tents and RVs! If you don't need a hookup, camp in "the Orchard" for $10 per tent, van or small trailer, payable to EORenew (reservations strongly recommended at 541-575-3633). If you would like to camp in the RV park with full hookups, call John Day/Canyon City Parks and Rec. at 541-575-0110. RV slots go fast, so call early! Unplugged RVs are also allowed free around the edges of our 30 acre parking field, 1 block east of the fairgrounds on Third Street.

For information on SolWest and the Grid-Intertie Installation Workshop, contact: SolWest/EORenew, PO Box 485, Canyon City, OR 97820, 541-575-3633, <solwest@eoni.com>.

SolWest Pre- and Post-Fair Workshops

In addition to workshops during SolWest weekend, two tuition-fee workshops will be offered to students who wish to learn a subject in more depth. Richard Perez, owner and publisher of Home Power Magazine, and Chief Wrench Joe Schwartz will teach a workshop July 26th through the 28th on grid-intertied photovoltaic systems. Participants will be walked through the permitting process, electricity basics, hardware, site review, and installation. The workshop will include an actual hands-on system installation on the Grant County fairgrounds. Tuition for this workshop is $225.

On Monday July 31st, Joseph Singleton of Palouse Wind and Water will teach Utility Intertied Wind Power for Home and Ranch. Joseph lives with wind power and solar hot water, and installs both. He will show how to assess wind possibilities for a range of situations from family home to high-volume irrigation. Tuition is $45.

Late signups on a space available basis. Contact us at 541-575-3633 for information.

Special SolWest Speakers

Randy Udall, Director of C.O.R.E.

Since 1994, Udall has directed the Community Office for Resource Efficiency (CORE), a nonprofit energy organization in Colorado. CORE promotes renewable energy in partnership with Holy Cross Energy, a rural electric utility serving 40,000 people in western Colorado. Holy Cross now leads the nation in the percentage of its customers who buy wind power, and it also has more grid-connected photovoltaic systems than any of the 930 rural electric utilities in the nation.

In 1999, Udall started the nation's first solar production incentive program, which pays people who install PV systems 25 cents per kilowatt-hour for all the energy their systems produce. Udall has served on Colorado Governor Romer's Renewable Energy Task Force and the Board of Directors of Solar Energy International and the Colorado Renewable Energy Society. He has published articles in Solar Today and Home Power, and his work with CORE has been covered by the Christian Science Monitor, Rocky Mountain News and other publications. Saturday, 12:30 in the Sale Barn.

John Perlin, author of From Space to Earth: the Story of Solar Electricity

Dr. Elliot Berman, former chief scientist of ARCO Solar writes in **Science** magazine: “John Perlin's down-to-earth story of photovoltaics tells of people who took an existing space technology and used it to improve the quality of life on Earth. The book is written at a layperson's level. My mother, my aunt, and my wife - none of whom had any science education beyond junior high - all ‘loved’ the story and found it a ‘good read’.”

John’s slide presentation parallels the story in the book which charts the step-by-step development of photovoltaics. Perlin is also the author of A Golden Thread: 2500 years of Solar Architecture and Technology and A Forest Journey: The Role of Wood in the Development of Civilization. Sunday, 12:30 in the Sale Barn

Steven K. Roberts

Microship and BEHEMOTH: Solar-Powered Technomadic Adventure Machines

Technomad Steven K. Roberts will present two solar-powered platforms for extended adventure, BEHEMOTH and Microship. The 580-pound recumbent bicycle called BEHEMOTH was Roberts' home for 17,000 miles as he wandered the US throughout the 80's, living on the Network and writing full-time while on extended tour. Roberts has now retired the $1.2 million BEHEMOTH to build a pair of canoe-based amphibian pedal/solar/sail trimarans known as Microships.

SolWest is the first public showing of the canoe-scale amphibian pedal/solar/sail micro-trimaran Microship that has been in development for 7 years. Steve and his partner Natasha launch next Spring on an open-ended coastal/inland expedition aboard a networked pair of these tiny boats, Io and Europa.

Both machines will be discussed in broad detail, with close attention to the Microship solar and power management system that includes a 480-watt folding foam-core PV array managed by a custom dual-processor, 8-channel peak power tracker and a thruster controller that adapts propulsion load to the current requirements of the battery and on-board systems.... all with a browser-based graphic front end.

Oregon MSR Quarterly Meeting

April 11, 2000 10:00 am—1:00 PM

Oregon Office of Energy Salem, OR.

by Christopher Dymond

MSR Minutes for April 11, 2000

Frank Vignola has been awarded a three year contract for solar monitoring from the BPA to support regional utilities.

Committees

Marketing – No progress

Financing – 5 systems have been approved. The market has not coalesced to create a real viable financing program. What is the audience? What is the best vehicle. The Business Energy Tax Credit can potentially be used to benefit any entity regardless of tax status. This is currently handled on a case by case basis. It requires the use of non-public funds to finance the project and the use of a third party who buys the tax credit, i.e. a "pass-though". As an example a loan from a bank or SELP are non-public fund and therefore make the project eligible for a pass-though tax credit.

Training – no report

Codes - Christopher contacted the Ashland

Building Official and got a verbal approval for solar general contractors to do the PV module mounting. All electrical connections must be done by a licensed electrical contractor. Frank is trying to raise the issue of solar licensing on the National level. Possible low voltage license may exist. Code change questions – Utility accessible disconnect switch, testing, and when does the code change go into effect.

Schools – EPUD's Elmira school project is proceeding . Joe is working on setting up a billing system for customers to pay $5-10 extra a month for PV power. EPUD will donate labor and time to help set up this first pilot project.

PGE's efforts for North Salem HS (John Yoder) and Franklin HS in Portland. Donation and billing system will be set up through PGE's web site in June. Donations will go into a fund for PV hardware and administration costs. Schools will be responsible for the installation.

Utility Programs – Don Spiek has discussed the NW Solar Alliance with several utilities. EWEB and other public utilities are participating in the Pollution Solution Tour – EPUD and EWEB are involved. Elly Adelman is the new Utility Programs chair.

Discussion of MSR Organization

Quarterly meetings are needed – center meetings around specific agenda items.

Task conference calls as needed.

Conference calls will be setup by OOE on an as needed basis

Emails are used for support and filling in the middle

July as solar awareness month

Christopher is working to set up solar awareness month in Oregon.

The coalition needs to meet before July to plan some activities.

MSR Tasks

April 20th will be the award notice date for MSR Grants from US DOE

Task 1 – Building Consumer Confidence (Doug B, Tom S, Andrew K, Lisa Schwartz)

Task 2 – Fostering Utility Support (Christopher D, Mike N, Elly Adelman, Jennifer Williamson?)

Task 3 – Identifying Needs and Opportunities (Christopher, Frank)

Task 4 – Tools for Solar Schools (Frank V, Joe S)

Task 5 – Transpired Collectors (Christopher)

Next meeting date depends on if MSR proposal is successful. Will set meeting time after April 20.

Solar Charging Station

(Continued from page 1)

the bike rack for recharging electric bicycles.

The charging station includes outlets for both 12 and 24 volt electrical systems and will charge at a three amp hour rate (or 1.5 amperes when two bikes are plugged in). The rack is located on city property at the corner of 4th and F streets, adjacent to Grants Pass' Growers Market which is active from May through October.

[*There was a large write-up of the solar charging station in the business section of the Saturday July 8th issue of the Register Guard. Ed.*]

Oregon MSR Coalition Meeting Minutes

Tuesday May 30, 2000 1:00 – 4:00 PM

World Trade Center 2—River Room Portland, Or

by Chris Eames

1. Introductions

Attending were: Wayne Lei of PGE (Environmental Policy), Doug Boleyn, Elly Adelman, John Patterson, Brent Wisniewski (Dryer & Son), Tom Ullmann of P.G.E., Andrew Koyaaanisqatsi, Christopher Diamond, Jane Peters, Frank Vignola, & Chris Eames.

2. Overview of Current Programs Funded by MSRI

Christopher Dymond described the five current programs that are "on tap" for the near future. The first is photo-documentation of case studies of solar thermal and other existing solar applications on Oregon. Several system descriptions will be gathered by The Energy Service Company and Doug Boleyn for inclusion on the OOE website and will be made available to industry and utility representatives. This program is scheduled to be complete in October.

There is also a project and workshop taking place in Ashland for electricians, utility representatives, and other interested parties to learn how a PV system will be incorporated into the physical plants of various building operated by the City of Ashland. 25-30 of the Participants are licensed electricians. It is unknown at this time whether anyone from the State of Oregon Electrical Board will attend.

There is an informational tour of Solar installations in Oregon taking place in September on the 12, 13, 14, & 15th.

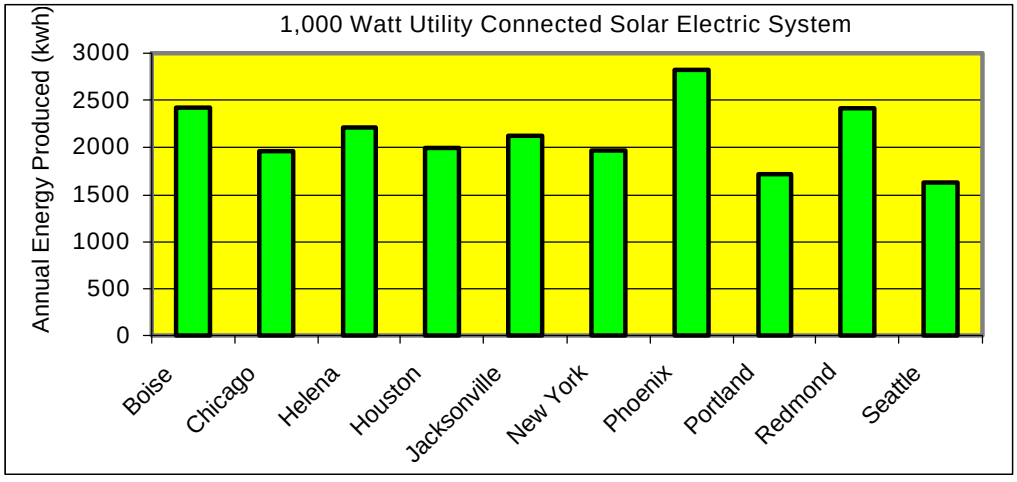
Other projects include an education program for Elmira High School in Elmira, OR being developed by Joe Savage and Frank Vignola. This "Tools for Schools" program should be ready for the beginning of fall term 2000.

The need for a specialty license for limited plumbing and electrical activities related to the installation and maintenance of Solar Systems (Thermal and Photovoltaic).

3. Solar Awareness Month - July 2000

Idaho, Montana, Washington and Oregon will be seeking opportunities to generate greater public awareness of the benefits of clean solar energy to our economy and the environment, as well as provide information about the various incentives, rebates, and/or tax credits available in each state. In Oregon, OOE will be providing books to school libraries about renewable energy. Also, in Portland at Pioneer Square on July 17th there will be a "Solar Event" where there will be music, solar ice cream, demonstrations and displays. Solar Awareness participants include WSU Cooperative Extension - Energy Program, National Center for Appropriate Technology, Idaho Department of Water Resources, Oregon Office of Energy, US Department of Energy, Bonneville Power Administration, Oregon Million Solar Roofs Coalition, Oregon Solar Energy Industries Association, and Bonneville Environmental Foundation. Christopher Dymond will have a Webpage up sometime in June. Look at: www.energy.state.or.us/SolarAware

Contact Christopher Dymond or Kathy VanHorn at Oregon Office of Energy for more information.



Comparison of two axis tracking 1 kW solar electric arrays around the country. Note how well many Pacific Northwest cities compare to those around the country.

PVWatt from NREL was used to make the comparison.

Graphic created by Christopher Dymond of the Oregon Office of Energy.

Solar Water Pumping

by Justin Klure

Cost Comparisons -- 160 Watt Solar Water Pumping System

	Line Extension	Diesel Generator	PV System
Installed Costs	$ 10,000 (1 mile)	$ 1,300	$ 3,800
Equipment Life	30 years	15 years	20 years
Annuals Costs			
Maintenance	$ 500	$ 100	$ 25
Energy Cost	$ 32 ($.045/kWh)	$ 220 (180gal x $1.20)	$ 0
Total Operating Cost	$ 532	$ 320	$ 25

PV System Savings and Payback (compared with gas)

Additional cost of PV system	$ 1,500
Oregon Office of Energy rebate	$ 100*
35% Business Energy Tax Credit	$ 490
Additional cost after rebate and tax credit	$ 910
Yearly cost savings on maintenance and fuel	$ 295
Simple payback ($910/$295)	3 years

*While funds last, a $100 state rebate is available if the PV system costs less than a power line extension

Solar pumped water tastes better. (photo Christopher Dymond)

SB 1149 Organizational Development Interim Renewables Advisory Committee Discussion Minutes—May 25, 2000

Present: Jeff King, NWPPC; Bruce True, PGE; Jason Eisdorfer, CUB; Peter West, RNP; Frank Vignola, OSEIA; John Savage, OOE; Jeff Bissonette, NWEC; Brian Hedman, Pacificorp; Dave Robinson, SEA of O; Carol Brown, PGE; Doug *, PGE; Eugene Rosalie, NWEA; Angus Duncan, BEF; Marshall Soba, ICNU; Barrett Stambler, Pacificorp.

The group reviewed the process undertaken to date to establish a new nonprofit organization to fulfill the mandate of SB 1149. The fundamental policies and direction for the new organization were outlined and the process for creating the new organization was reviewed.

The Interim Advisory Committee expanded a preliminary list of issues that need to be answered if some activity is going to take place before the new nonprofit is up and running. The following list of issues were developed:

1. *What is the role of SBC funding in green portfolio options?*
2. *What role should utilities play in renewable resource funding through the SBC?*
3. *Is there a need for an early RFP or auction to fund a central station renewable project?*
4. *What activities would be eligible for funding?*
5. *Could resources funded under an early RFP/auction (#3) be used to support a green portfolio?*
6. *What structure(s) and protocol will be used to manage money – in the short-term and long term*?

There was significant discussion about the process for working through these questions. There was general agreement that PUC input would be necessary for several of the questions above before the committee could proceed very far. Questions #1-#3 were seen as the most fundamental questions, and questions #4-#6 were seen as details that relate to the first questions.

Getting PUC input early will be critical before the Interim Advisory Committee could develop a more specific proposal for consideration. There was some disagreement about how much preparation would be appropriate prior to PUC input.

In general, the group agreed to the following process:

- *Identify questions/policies that need PUC input (issue questions #1- #3)*
- *Get PUC input to define whether to proceed, the direction to proceed and the questions that will need to be resolved in a more specific proposal*
- *Develop a detail proposal, using information from issue questions #4-#6 and others to address the options and direction for interim renewable investments.*

Net Metering— Spin Your Meter Backwards!

By John Corkett

As photovoltaic systems are increasingly used to power the electrical needs of homes, owners are looking at ways to offset their electric bills.

Net metering is a concept that allows homeowners with solar electric systems to receive the full value for the electricity that their solar energy system produces. It can also apply to other renewable energy generation systems. The actual term, *net metering*, refers to the method of accounting for the solar electric system's electricity production.

The kilowatts produced by a solar electric system are first used for any electrical appliances in the home. If more electricity is produced from the system than is needed, the extra kilowatts are fed into the utility grid. Homeowners pay one rate for the net difference between the amount of energy they use from the utility and the amount produced by the solar electric system.

With net metering, the home's electric meter will actually run backwards when the solar electric system is producing more energy than is needed to operate the home.

Montana, Oregon, and Washington require regulated utilities to offer net metering for customers with solar electric and other systems.

With net metering, the home's electric meter will actually run backwards when the solar electric system is producing more energy than is needed to operate the home. At the end of the month, if the customer has generated more electricity than is used, the utility may either credit the net kilowatt-hours produced for next month's bill or buy the excess power at wholesale rates on either a monthly or annual basis at the wholesale power rate. If customers use more electricity than they generate, they pay the difference at the regular retail rate.

With net metering, the homeowner with a solar electric system can "bank" energy selling it to the utility when it's not needed and buy it back when required. It allows homeowners who aren't home when their systems are producing electricity to still receive value for that electricity without having to install a battery storage system. The power grid acts as the customer's battery backup, which saves the customer the added expense of purchasing and maintaining a battery system.

Off Grid Solar Electric Power: Often the Least Cost Power Choice - NOW!

By Mike Nelson

While the public is most familiar with the use of PV cells for calculators and watches, many homeowners, businesses, local, state and federal agencies are already using solar technology cost effectively for an increasing number of their energy needs. Many remote solar applications are already the least cost, most environmentally friendly choice. Solar electric use has grown from only a few thousand applications in the early 1980s to hundreds of thousands today. There are many applications for which PV power can save money over the lifetime of the system. The following are but a few examples.

Remote Occupied Station and Remote Homes

PV can increase the comforts of remote ranger stations and fire lookouts. These systems are the forerunners of residential systems that can be fully independent of the grid. Over 20,000 U.S. houses are now fully powered by PV. In Montana, Idaho, Oregon and Washington there are several thousand off grid homes. These range from mountain cabins near Butte to million dollar mansions in the San Jauns. With utility line extensions often running in excess of 30 thousand dollars per mile, the solar option will only look more attractive as time passes. Remote home solar electric applications are only the tip of iceberg.

AREA LIGHTING

Cost-effective lighting systems are powered by photovoltaics operating throughout the world -- tens of thousands just in the United States

Security lighting can be powered by photovoltaics at a fraction of the cost of extending utility lines to remote areas. Timers, photocells, or sensors can control the lamps. Many firms in the United States dealing with photovoltaics sell prepackaged systems containing a photovoltaic power supply, battery, lamp and ballast, and controls.

Most photovoltaic lighting systems operate at 12 or 24 volts DC. Although incandescent and halogen bulbs that operate at 12 volts are available, fluorescent and sodium lamps are recommended for -- up to four times that of incandescent lamps.

A state-of-charge controller may be required to avoid overcharging the battery or to prevent deep discharge. Batteries and controls are usually placed in a weather-resistant enclosure. The array or module can be mounted on a pole or on the ground, or even on the structure to be illuminated. Elevating the photovoltaic module can reduce the risk of vandalism.

Ground mounted PV panels for Solar electric home. Photo curtsey Energy Service Company.

Solar panels help police keep track of motorist speed.

The principal uses of photovoltaic lighting include:

- Highway signs
- Parking lots
- Marinas
- Pathway security
- Bus stop shelters
- Streetlights
- Traffic hazard signs
- Traffic control signs
- School zone safety lights
- Billboards
- Fire station preemption
- Railroad crossings
- Disaster relief shelters

The city of Grand Junction welcomes visitors with a PV-powered road sign that displays the city's name and logo. Two of these signs are located on either side of the city on Highway I-70. Three 75-watt modules, located several feet from the sign, charge the batteries. The batteries provide energy for the lights for 8 hours each night. Thus, the lights remain on throughout the night during the summer and until 1 a. m. during the winter. The battery ca-

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pacity can maintain the lights for 5 sunless days. The cost of each PV system was $2,300 -- considerably less than a line extension. The systems have performed according to expectations since they were installed in 1988.

Additionally, the signs have been well received by the entire community, because the lighted signs provide a pleasing highlight and architectural statement that is in keeping with the city's image.

Total Cost of PV and Load Equipment: $4,600

Street Lighting

The Bent Tree Community Association installed 26 PV-powered streetlights in the summer of 1991. Two 48-watt PV modules charge two batteries. The battery capacity enables the light to operate from a full charge for 12 hours a night for 4 nights without recharging.

The community association decided to use PV instead of the local utility service for three reasons. First, the initial cost of each PV streetlight was approximately $2,000 less than the utility service, because of trenching requirements for the electrical lines. Second, the city would have had to raise community taxes to pay for these utility streetlight costs. And, third the community would have had to pay monthly utility bills for the lights.

Both community officials and residents have been satisfied with the performance of the systems despite one case of vandalism. In fact, in the aftermath of Hurricane Andrew when utility power was out for 33 hours, the only street light came from the 26 PV lights

Total Cost of PV and Load Equipment: $52,000 less than utility option

Traffic Hazard Signs

The city of Lacey, Washington, Police Department is employing PV-powered speed warning devices. Systems like this are especially effective in neighborhoods that prefer to avoid the noise and air pollution emitted from gasoline powered generators.

Total Cost of PV: $150 (not including radar equipment)

MONITORING

Monitoring is one of the largest applications for photovoltaics. Instrumentation and data communications equipment require a power supply to maintain their batteries state of charge. Photovoltaic power supplies are ideal for this application because of their simplicity and reliability. Most applications require less than 200 watts. Almost all of these systems operate at 12 volts DC. The load can vary with the activity, whether continuous or periodic, or the rate at which samples are taken or data are transmitted.

Many monitors require only one module. The data acquisition equipment and batteries are usually located in the same weather-resistant enclosure, which is sometimes buried for protection. Controls for these power systems are usually minimal, but they sometimes require a battery-charge regulator. The module is usually mounted on the ground or on a pole; it should be securely anchored to prevent theft.

Monitors are used for:

- Highway conditions
- Water level gauge stations
- Automatic traffic recorders
- Road ice detection systems
- Meteorological information

Automatic Traffic Recorders

The city of Missoula, Montana installed two permanent PV-powered automatic traffic recorders (ATRs) within the city limits. The units record information on traffic flow rates and vehicle velocities, which then can be used in the transportation planning process. The recorded data are preserved by battery power. The battery, charged by either a 5- or 10-watt PV module, maintains 15 days of reserve power. The PV addition to the ATRs cost $50 per installation. The cost to power the ATRs using a utility connection, including the meter, wiring, and regulator, would have been only $100 per installation, because utility power was available at the site. In addition to this cost, the local utility would have assessed the city a minimal monthly charge. Because the minimum monthly charge by the utility exceeded the ATR energy requirements, the city could not justify the cost of a utility connection and opted for PV power.

COMMUNICATIONS

Tens of thousands of photovoltaic-powered communication systems have been installed in the United States. These systems range in size from a few watts of photovoltaic array for call-box systems to several kilowatts for microwave repeater stations.

Applications for PV-powered communication systems include:

- Emergency call boxes
- Variable message boards
- Community warning sirens

(Continued on page 14)

The state of Idaho uses PVs to power communication systems. This installation is at Pilots Peak. (Photo courtesy of the Department of Administration)

Off Grid Solar Electric Power: Often the Least Cost Power Choice - NOW!

(Continued from page 13)

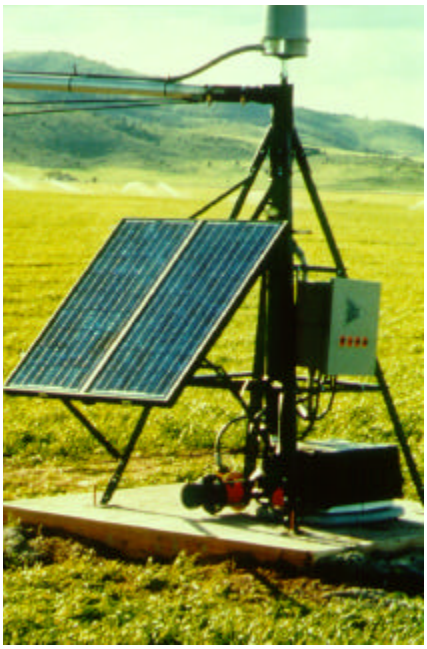
- Emergency communication
- Two-way radios
- Radio communications
- Mobile radio systems
- Cellular phone systems

Travel Advisory Radio Channel

The Washington Department of Transportation has installed radio transmitters powered by photovoltaics on I-5 to provide motorists with continuous information on weather and road conditions. The radios use a special AM radio frequency. The systems consist of a 100-milliwatt AM broadcast transmitter, 80 watts of photovoltaic power, and battery storage. The arrays cost $6,280.

Emergency Call Boxes

Washington State has installed emergency call boxes on the floating bridges in Seattle. Call boxes have several functions, including cellular phone communications, diagnostic features (e.g., battery state-of-charge, and system self-test), and providing the call box locations to a central computer. One 6.5 watt PV module charges a battery that will last through 38 sunless days when a call box is in its lowest state of readiness.



Irrigation Sales Company in Idaho Falls has designed and prefabricated a PV-operated mini-pivot called the Titan 2000. (Photo courtesy of Irrigation Sales)

There are thousands of PV-powered call boxes throughout California, and an increasing number on Washington's State Highways. Many local governments are adding 911 phones to enhance park and playground security.

WATER PUMPING

Around the world, water is pumped by a variety of methods, and no single technique is suitable for the range of existing needs. Stand-alone photovoltaic systems are increasingly being used to meet the need for small to intermediate-sized pumping applications-those between hand pumps and large generator-powered systems. More than 100,000 photovoltaic-powered water pumps are currently operating in the United States and abroad.

The advantages of using water pumps powered by photovoltaics include low maintenance, cleanliness, ease of installation, reliability, ability to operate unattended, and the capability to be matched to water usage needs. The typical range of sizes for photovoltaic-powered pumps is a few hundred watts of array to a few kilowatts of photovoltaic collectors for larger systems. Water pumping systems are used for**:**

- Median strip irrigation
- Park irrigation
- Livestock watering
- Irrigation
- Village water supplies
- Pond aeration
- Domestic use
- Water for campgrounds

WARNING SIGNALS

Over 50,000 navigation aides have been installed worldwide. PV has become the preferred source of reliable power for navigation aids and radio equipment at thousands of sites throughout the world. For example, a 425 Watt PV array powers the navigation and radio equipment aboard a natural gas distribution platform in the Gulf of Mexico. The U.S. Coast Guard and Navy maintain thousands of navigational aids, buoys and signals throughout the continent. PV systems are economic, reliable power sources for such applications.

CATHODIC PROTECTION

Each year, metal corrosion causes billions of dollars of damage to structures, pipelines -- anything made of metal and beneath the water or ground. Corrosion is a phenomenon caused when metals are exposed to electrolytes, such as in soils and water. Cathodic protection is achieved by reversing the flow of electrons. Photovoltaic systems can perform this task. The systems are quite simple in design, and most of them require less than 1 kilowatt of power. Typical applications include:

- Pipelines
- Bridges
- Buildings
- Wharves, docks, and marinas

Cathodic protection systems supply DC power to the steel pipes to prevent galvanic corrosion, which often occurs in unprotected pipes and metal structures.

OTHER COST EFFECTIVE SOLAR ELECTRIC APPLICATIONS

- Pond aeration
- Portable power
- Refrigeration during disaster relief
- Visitor centers in parks
- Campgrounds
- Highway rest stops
- Public beach facilities
- Community parks

City of Portland Labor-Management/ Service Improvement Study

Topic/Issue addressed: Cost effective way to reduce greenhouse gasses through the use of renewable solar technology

Problem: When the parking meter van and crew went out to fix the meters, the crew had to keep their engine running or fire up a gas fueled generator. This created noise pollution as well as air pollution. The crew went looking for ways to reduce the emissions from the truck and generator.

Improvement

A gas powered electrical source parking meter repair truck was converted to a solar- powered electrical-source vehicle. Eight photovoltaic modules were mounted on top of the van. The electricity that is created by each panel is converted to supply 120 volts of alternating current, which powers the vehicle's interior lights and several electrical outlets.. the new system allows workers to run power tools for on the spot repairs without running the engine or a gas -powered generator. The solar generator was developed with off-the shelf components.

"minimum dollar savings for a Mobile Solar Generator in a 10 year life cycle is $19,188.00"

Results Anticipated or Achieved

A public/private partnership with PGE

Received the Bureau of Environmental Services '1998 Pollution Prevention Recognition" Award.

The project decreases pollutants without an engine running, reduces ventilation requirements in local areas due to no emissions. Saves gasoline fuel and improves reliability with no operator starting requirements from the 24 hr 365 days a year running inverter power system and lower maintenance costs of the vans' power system by over a 95% reduction as compared to the internal combustion engine. Improved air quality for employees and citizens, reduction of refueling and special disposal of used oil and filters, increased reliability and less downtime due to preventive maintenance requirements

Electronic testing of equipment can be done in the field (due to the pure sine wave from the inverter) instead of running back and forth to the shop to test equipment.

The minimum dollar savings for a MSG Generator in a 10 year life cycle is $19,188.00 plus the health & operational friendly benefits for the operators.

Labor
Name. Tom M. Ullmann
Phone- (503) 823-1755

Management
Name: Ron W. Rupert
Phone: 503.823.1721

Start date of effort: Project #1 - 12/97 with P.G.E., Project #2 - 9/99 with B. E.S. End date of effort: Project #1 9/99 with P.G.E.

Team Leader- Tom M. Ullmann

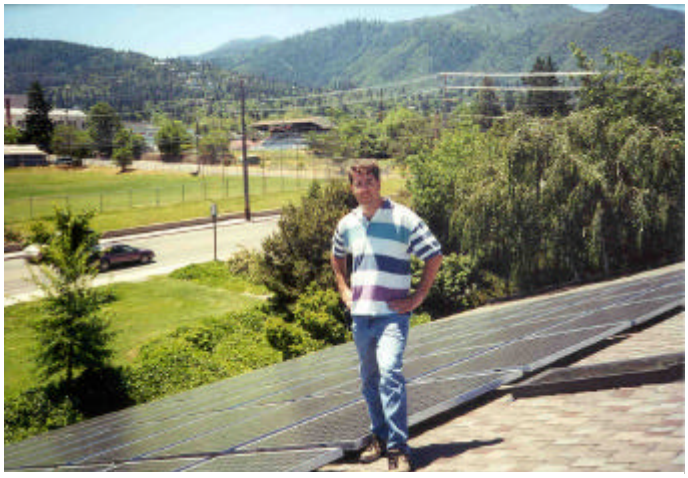
Facilitator/Resource Staff. David Tooze/Energy Office, Doug Boleyn, P.E./P.G.E.

[*For more information see SEA of O's July issue of the* ***Energizer***]

Ashland's PV Pioneer Program

The city of Ashland will soon offer solar electric power to its customers. For a $4.00 extra charge per month customers can purchase a portion of the output from one of four solar electric systems located on the SOU library, the Ashland Shakespeare Festival, the City Council Building and the City Police Station.

The city acts as a broker, buying the power from the systems and selling it to its customers at a premium. With the support of the Oregon Office of Energy, Bonneville Power Administration, Bonneville Environmental Foundation and Avista Corp., the city has made it possible for the four locations to recover their costs in about 7 years.



Tim McFail of Applied Power stands next to the 15 kW PV array installed on Ashland's police headquarters. A total of 25 kW is being installed in the first phase of the Ashland Project.

A solar monitoring station, funded by a contract with Bonneville Power Administration, has been installed next to the 15 kW array by the U of O Solar Radiation Monitoring Laboratory to monitor system performance. By the end of July, one should be able to call up a web site and view the performance of the system on the internet.

Oregon Solar Energy Industries Association
2468 Hawkins Lane
Eugene, OR 97405-1202

Printed by the Oregon Million Solar Roofs Coalition