

SOLAR RISING

January 2004

Volume 6, Issue 1

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

Bringing you tomorrow's sustainable energy technologies today!

- that directly affect the solar industry in Oregon
- Listing in Oregon Solar Directory© for voting business members
- OSEIA web site advertising for voting business members
- Newsletter published quarterly
- Membership in the national SEIA organization
- Reduced tuition fees for OSEIA sponsored training classes



OSEIA Member Benefits

Membership is open to all those who share OSEIA's mission of promoting renewable energy in Oregon, increasing the public's awareness of renewable energy applications, and building a strong renewable energy industry in Oregon.

OSEIA works with the national Solar Energy Industries Association and other state and regional chapters to develop pro-solar programs nationwide.

Your support enables OSEIA to take on projects such as the hiring of an Executive Director to keep solar energy in the forefront of discussions with state officials and work closely with the Energy Trust of Oregon to establish solar energy programs. These projects undertaken by OSEIA take time and money and benefit all of the solar businesses in Oregon.

OSEIA accomplishments include:

- Established since 1981 . one of the oldest SEIA chapters
- Sponsored legislation that extended Oregon's Energy Tax Credit indefinitely
- Developed the OSEIA hot water tank insulation standard through the Oregon Office of Energy
- Sponsored the Solar Pioneer Project that established Oregon as the first state in the nation with solar PV panels on its Capitol building . OSEIA members provided management, labor, and materials.
- Sponsored Senate Bill 932 establishing the Limited Renewable Energy Technician License and the Solar

- Plumbing license
- Established the Limited Renewable Energy Technician Apprenticeship Program

By becoming an OSEIA member:

- You increase the voice of solar advocacy in Oregon
- You gain access to a network of professionals working towards Oregon's clean energy future
- You are represented in legislative and regulatory proceedings in Oregon
- You impact national energy policy through the national SEIA organization
- You support the development of solar Apprenticeship Programs
- You are kept up to date on solar issues in Oregon through OSEIA member updates
- You support the industry that is helping to support you

Our members enjoy many other benefits including:

- The right to vote on member issues

VOTING MEMBERSHIPS+ Annual Dues

- Small Business (\$0 to \$200k gross sales*) \$300
- Medium Business (\$200k to \$750k gross sales*) \$450
- Large Business (\$750k to \$5Million gross sales*) \$600
- Manufacturer (greater than \$5Million gross sales*) \$1500
- Utility (\$300 min - \$1500 max) \$0.01/meter
- Professional Individual (Independent Designers, Architects, Engineers, etc.) \$100

NON-VOTING MEMBERSHIPS

- Manufacturer (greater than \$5Million gross sales*) \$750
- Government Agencies \$500
- Non-Profit Organization \$50
- Associate Individual . Renewable Energy Supporter \$50
- Student \$35
- Honorary \$0

†Voting Membership required for listing on website and Oregon Solar Directory©

*Gross annual renewable resource energy sales

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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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OSEIA Meeting Agenda

January 13, 2004

11:45am-3:30pm

EWEB Conference Room—Eugene

1. Pizza and soda served at 11:45
2. (15 min) Introductions and welcome new members-start at 12.
3. (5 min) Approve previous meeting minutes
4. (20-45 min) Board Elections
5. (10 min) Treasurers report
6. (45 min) Executive Directors report
 - License issues
 - Continuing Education Courses
 - Legislative issues
 - ASES 2004 Portland Conference – July 10- 14
 - 2004 dues reminder
 - ETO program update
7. (15 min) NABCEP update (Bob-O Schultze)
8. (60 min) Preparing for OSEIA's 2005 legislative agenda (John McIntosh)
 - Contacting your representatives
 - Finding legislative sponsors
 - Possible legislation items:
 - Tax Credit carry forward measure
 - Net Metering
 - Possible RPS support
 - Incentives to support 'solar ready'/ net energy home building
9. (30 min) Oregon State Tax Credit Update (Christopher Dymond)
 - Latest information on Oregon State Tax Credit
 - Maximizing business financial incentives
 - Short course on showing your customers how to maximize their solar system and minimize their costs⁹.
10. (5 min) Membership Issues
 - Set date for next meeting
11. (5min) On the horizon announcements
 - Harvesting Clean Energy Conference, Portland – Jan 20-21
 - ASES 2004 Portland Conference—July 10-14
 - SolWest Renewable Energy Fair, John Day – July 23-25

Contact Information

OSEIA Web Page

<http://www.OregonSEIA.org>

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Energy Outfitters

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Vice President: Bob-O Schultze

Electron Connection

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Secretary: John McIntosh

Cascade Solar Works

(541) 548-7887

Treasurer: Andy Bortz

Solar Design & Consulting

Ph. (541) 753-8725

OSEIA Member	Company	Phone	OSEIA Member	Company	Phone
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Burr Boutwell	Bingham Construction	(503) 224-2676	John Patterson	Mr. Sun Solar	(503) 222-2468
Bob Claridge	Bobcat and Sun Construction	(541) 389-7365	Lloyd Marbett	Oregon Conservancy Foundation	(503) 637-3549
Angus Duncan	Bonneville Environmental Foundation	(503) 248-1905	Chris Dymond	Oregon Office of Energy	(800) 221-8035
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Don Spiek	EWEB, Attn: E.M.S.	(541) 484-1125	Rick Reed	Sun Earth Inc.	(909) 605-5610
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Christel Bieri	Heliodyne, Inc	(510) 237-9614	Tim Dawson	The Solar Collection, Inc.	(541) 535-5364
Joe Schwartz	Home Power Magazine	(541) 512-9281	Frank Vignola	U of O Solar Radiation Monitoring Lab	(541) 346-4745
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Highlights of the October 14, 2003 Oregon Solar Energy Industries Association Meeting

by Jon Miller



OSEIA Members,

We had another good meeting on Oct 14th. Highlights of the meeting are below. Thanks again to EWEB and Don Spiek for all the work involved with setting up the conference room and arranging food and drinks!

1. Next meeting date scheduled
2. OSEIA dues increased for business members
3. Sunriver conference discussion
4. Peter West update of the ETO solar programs
5. OSEIA's long range vision for Oregon's solar industry
6. Your attendance is crucial if you want your views to be heard!

1. Our next meeting date is: January 13th from 11:30 - 3:30pm at EWEB. Officer elections will be held so we hope to have a large turnout!

2. OSEIA dues were increased for small, medium, and large business members (See articles on topic).

It was unanimously agreed that the current dues were not sufficient to carry out OSEIA's mission during this critical time for Oregon's solar industry. It was also stated that the increase in dues is not enough to fund OSEIA's expenses and the executive director is responsible for raising additional funds by increasing membership and seeking grants. Dues can be waived or changed for 'low-income' members as stated in our bylaws (affected businesses need to petition OSEIA Officers on this - If this applies to you please let me know, we do not want to

exclude small business members!).

The increased dues are needed to support the executive director position and our increased activity in Oregon. In October alone I will have attended 3 renewable energy forums and 2 energy fairs on behalf of OSEIA at a cost of over \$1200 (including registration fees and travel expenses). It's important that we continue to be present at these events. I can't continue to absorb these expenses on the current salary.

I believe our increased visibility at fairs and forums is having an impact. Along with the increased activity due to the ETO solar programs we are also seeing a dramatic increase in our website statistics. Website analysis indicate a 3-4x increase in website activity since May 2003. The Oregon Solar Directory has been downloaded over 800 times since June (128 times so far in October). Energy forums are scheduled all over Oregon and are 'surprised and happy' to finally see the solar industry attending.

We will have a heavy year of activity in 2004 to prepare for the 2005 legislative session, administer the LRT apprentice and solar license issues, and assist with the national ASES conference. The additional dues will help OSEIA to become a driver of solar issues in Oregon instead of reacting to issues as they arise.

3. Sunriver conference and OSEIA's primary position:

- Solar energy means jobs all throughout Oregon
- The solar industry is growing and able to assist in making solar programs a success
- The current contractor based industry (composed primarily of small businesses) is the model we support. The actions of these businesses do not have to be replicated by the utilities but instead leveraged by the utilities to create successful programs.
- OSEIA is in position to make it easy for utilities to provide input to the industry and to provide feedback to the utilities from the industry.

4. Peter West gave an update of the ETO solar program:

- This was important information for those interested in ETO programs and for providing input directly to Peter West, the ETO Director of Renewable Energy.
- The solar electric program has been a huge success! Over 90 PV systems have been reserved for ETO funding. Average size is about 2.6kw. That is 3x the number of normal system installs in Oregon.
- The solar thermal program is rolling out. Incentives are available at this time. Please check ETO website for more information on exact incentive amounts. There will be different incentive levels for gas vs. electric water heaters.
- OSEIA is formulating recommended changes to ETO programs to make them more efficient for 2004. Please email any issues you would like to see addressed.

5. OSEIA needs to develop a long range vision for the solar industry in Oregon.

- If we don't do this someone else will.
- We must become a driver of ideas and conferences rather than simply reacting to issues as they arise.
- OSEIA should be organizing more communication between manufacturers, distributors, and contractors.

6. OSEIA meeting attendance

- Attendance during the middle of the year is difficult for contractors who are very busy. That's great news that you are busy - but we need your input and regular attendance at member meetings! A huge part of your membership benefits is providing OSEIA with information on what you're seeing in the marketplace. OSEIA's actions are guided by your input so please try to attend future meetings.
- Please be sure to attend our next Annual Meeting on January 13th from 11:30 - 3:30pm at EWEB in Eugene.

Monitoring PV Systems

by Frank Vignola

The UO Solar Radiation Monitoring Laboratory (SRML) is under contract with the Energy Trust of Oregon to monitor 6 photovoltaic systems in Oregon and to improve estimates of PV system performance.

The systems range in size from 1 to 5 kW peak DC and are located in diverse areas from Cannon Beach to Klamath Falls. A variety of modules and inverters are included in the study from Shell CIS thin film to Sharp multi-crystalline modules. A more comprehensive report will be filed with the Energy Trust after the monitoring systems installations are completed.

The incident solar radiation, ambient temperature, wind speed, and module temperature will be measured along with DC current and voltage and kilowatt hours (kWhrs) AC produced. The goal of this project is to enable better estimates of the kWhrs produced. In addition, these data can be used to verify that modules and inverters perform up to specifications in the field.

The Energy Trust has inspectors who go out and see how a system is performing. The data collected through this monitoring program will help the inspectors know how much power systems should be generating when they inspect the systems.

Two examples are given to show some of the information that can be deduced from the data being gathered. In Fig. 1, the DC output of an approximately 1 kW peak DC array is compared with estimated DC power output using a modified version of PVWATTS software developed for the National Renewable Energy Laboratory. The data points are 5 minute average values of DC power output obtained by multiplying the DC times the DC current. For example, the value of 0.5 kWhr/hr is the average production over 5 minutes multiplied by 12 to give an hourly output assuming the rate in those 5 minutes is the same over the hour. This way, 5, 10, 15, 30, and 60 minute data can be compared on the

(Continued on page 5)

% difference verses measured DC output
Grants Pass December 2003 South Facing Array
Assuming a 0.85 kW AC array

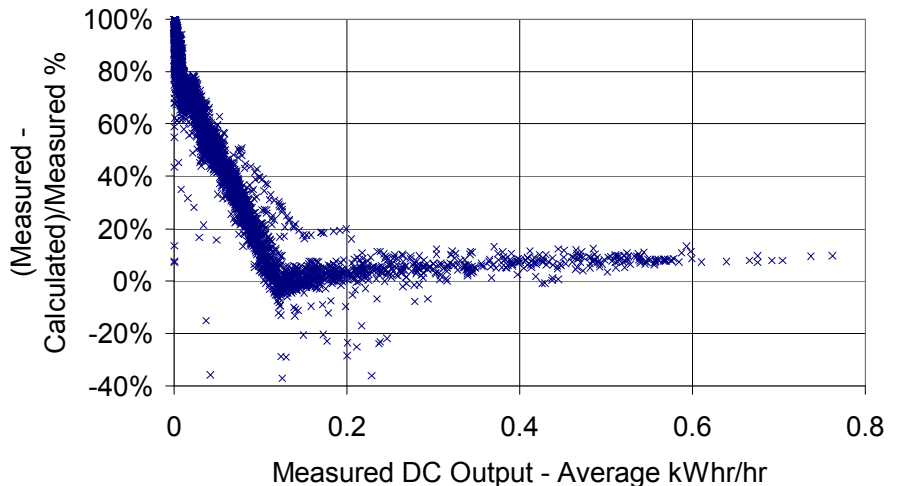


Fig. 1: Measured DC output verses calculated DC output of the south facing 1 kW DC peak array on Bob Maynard's house in Grants Pass. The system uses Sharp panels and a Sharp Sunvista inverter. Note that at low power, the model underestimates the power produced and the difference approaches 100%. The uncertainty at these low values is large. The high values can either result from offsets in the data or the fact that the model was developed using an earlier generation of inverter that did not perform as well under low power conditions. Further tests at this and other locations will help clarify the reason for the sudden change in the difference between predicted and actual performance.

Inverter Efficiency verses AC output November 2003

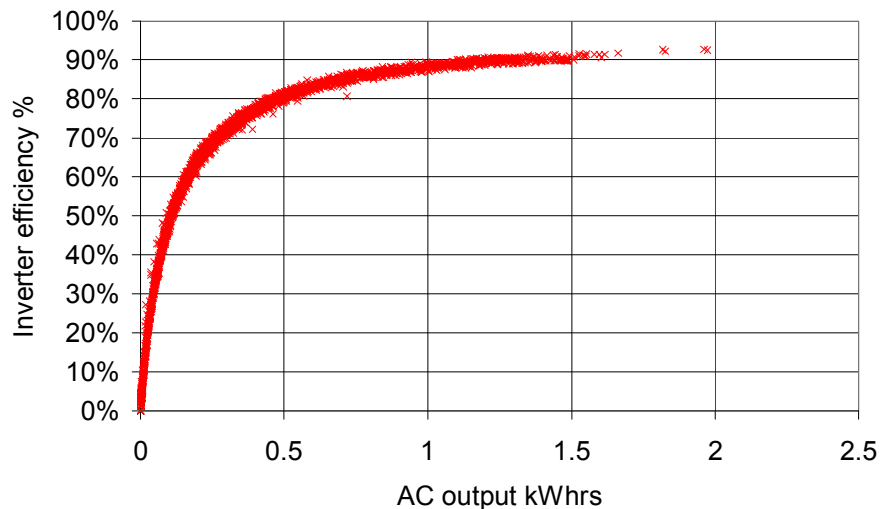


Fig. 2: Plot of inverter efficiency verses AC output. November 2003 data from a Sharp Sunvista inverter connected to 3 arrays on the roof of Bob Maynard's house. The arrays are facing approximately east, south and west. This plot shows how well the inverter converts DC electricity from the modules to AC output power. This plot does not show how well the inverter tracks the max power point.

Solar Data Now Available at Your Location

By Frank Vignola

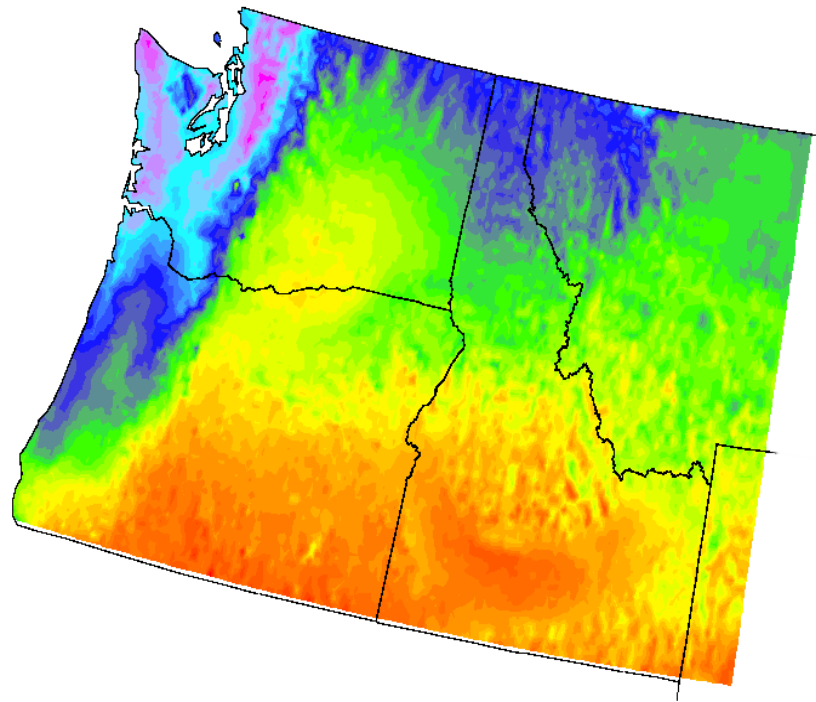
The University of Oregon Solar Radiation Monitoring Laboratory (UO SRML) has just finished a 3 year project funded by the Department of Energy, Bonneville Power Administration, Eugene Water and Electric Board, and the Northwest Power Planning Council to produce an hourly solar radiation database for the Pacific Northwest.

Richard Perez of the State University of New York at Albany modeled satellite data to generate a solar radiation database on a 0.1° grid (about 6 by 6 miles) for Idaho, Oregon, Washington. Solar irradiance data collected by the UO SRML was used for ground truthing the modeled values.

Hourly global (total on a horizontal surface), direct normal beam, and diffuse irradiance values were generated for 1998 through 2002.

This project was discussed at the Solar Summit in Bend at the end of October and a final report is being generated. Data from the project will be given to the Idaho, Oregon, and Washington energy offices along with information on how to use the data in estimating photovoltaic system performance.

A series of resource maps will be generated and made available on the UO SRML Website at <http://solardata.uoregon.edu>. A software tool is being tested that facilitates the use of this data in estimating the performance of solar electric systems. Now one can estimate solar system performance anywhere in the region.



Annual Average Global Irradiance from 1998-2002. This is a preliminary figure using an extreme color range. The range runs from about 3 kWhrs/meter² per day to a maximum of about 5 kWhrs/meter² per day. So even the rain forests in the Olympic Peninsula receive about 60% of the incident solar energy as the sunniest regions of the state. 2/3rds of Oregon gets as much or more direct solar radiation as Florida and the whole region gets more incident solar radiation than Germany, the country with the most installed solar electric systems.

Monitoring PV Systems

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same scale.

The modeled and measured values do not agree very well when the power production is less than 0.15 kWhr/hr. At higher production rates, the DC power output appears higher than predicted. These are preliminary results and the study has to be refined. However, This does show that the system performance

and model estimates are with 10%.

Inverter efficiency is shown in Fig. 2 on page 4. This inverter is connected to 3 arrays, facing approximately east, south, and west. The inverter appears to accommodate the production from the three arrays fairly well, even though each array produces different amounts of electricity over the day.

Work is proceeding to evaluate how well

the PVWatts based analysis program predicts the overall output of the system. It is much too early in the process to provide a detailed analysis of the modeling with any certainty, the preliminary results show that the PVWatts program does produce reasonable results.

Solar Survey of the Presidential Candidates

The following information on the views of presidential candidates on renewables was gathered from the SEIA e-newsletter. A more complete survey is on the SEIA Web page at www.SEIA.org.

The Sustainable Energy Coalition this week released the results of their 2004 Presidential Candidates Survey. Eight of the nine major Democratic candidates replied, with both the Rev. Al Sharpton and President Bush absent despite repeated contact with their offices.

All candidates support increasing DOE's renewable energy and energy efficiency budget, with several citing national security and economic development rationales in addition to environmental concerns.

- All candidates support increased Federal tax incentives and budget outlays for the encouragement of solar technologies.

Clark cites "incentiviz[ing] the public

and private sectors to work together on an aggressive research and development effort."

Dean proposes to expand the production tax credit to solar, institute the residential solar tax credit, and support Federal procurement.

Gephardt would increase the Federal investment tax credit to 30%, double the production tax credit "for renewables," and double Federal renewables spending over 4 years.

Lieberman cites nanotechnology investment as key to solar power, as well as the residential tax credits and expanding the PTC to solar.

- All candidates support using renewables as the primary driving force behind hydrogen development. Some are more specific: Kerry cites 80% from renewables, 10% for conventional power, and 10% nuclear, while Kucinich advocates renewables exclusively and Lieberman proposes a

50/25/25 split.

- All support an RPS, though none mention solar-specific proposals. Clark, Dean, Lieberman and Gephardt support 20% by 2020 specifically, with Kucinich calling for 20% by 2010.
- All would increase Federal purchase of renewable energy equipment; Lieberman specifically mentions the \$300 million PV program proposed during the Energy Bill debates.
- All support standardized national interconnection rules, with Clark, Dean, Gephardt, Kerry and Lieberman demonstrating an impressive grasp of the situation.
- All support national action to address CO2 emissions and climate change, though individual positions (esp. vis-à-vis the Kyoto protocol) are subtly differentiated.
- Positions are similarly subtle with regards to the continuation, size, and variety of tax incentives for nonrenewable energy.



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