SOLAR RISING

June 2003 **Volume 5, Issue 1**

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

Bringing you tomorrow's sustainable energy technologies today!

Grid-Tie Rises in Oregon

by Ian Williams

West facing array installed on the roof of Bob Maynard's garage. The top of the east facing array can be seen along the roof line. The south facing array is not shown in this picture. Since each array group receives peak power at different times, the inverter needs to handle three different strings.

OSEIA President Bob Maynard recently had one of the first residential grid interactive photovoltaic systems installed under the new Energy Trust incentive program. The System was installed on his 1500 sq. ft. home in a Grants Pass subdivision.

Bob's system will likely receive the maximum $7000 ETO incentive for residential systems; he can also look forward to an additional $1500 state tax credit next April 15th.

Bobs PV system is one of the first ten pilot Sharp systems to use the new SunVista inverter in the United States. The 3.3kw system is currently producing about 18-19 kWh per day. The system consists of 3 strings of 6 185W monocrystaline Sharp Modules that feed into the SunVista 3.5kW "Power Conditioner". Each string covers one point on the compass from east to west on different roof slopes.

Under an Energy Trust contract, Frank Vignola and Rich Kessler of the U of Oregon Solar Radiation Monitoring Lab are in the process of assembling a monitoring system. Once the monitoring

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Letter from Executive Director

by Jon Miller

OSEIA Members,

Today's economy presents all businesses with significant challenges. To survive in this environment the solar industry must take advantage of available resources – renewable energy incentive programs are one of those resources.

We must be aware of, and maximize, all incentives available to Oregon consumers that support the solar industry. If renewable energy incentive programs are cumbersome, or worse, prohibiting sales, then as an industry, we should find ways of improving them.

An array of incentives are available to Oregon consumers for solar installations. From the Oregon Tax Credits (up to $1500), to the Energy Trust of Oregon (up to $7000 for PGE and PacifiCorp residential customers, $20,000 commercial), to the BPA Bright Way program (up to $600 in some areas), to Green Tags (about $1000 on a 2kW system over five years), incentives are available.

Consumer protection standards are built in to most of these Oregon incentive programs. That is a good thing. However, if programs become so cumbersome that contractors avoid them, the program becomes self-defeating and the solar industry has lost a valuable resource.

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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

August 5,2003
11:00am-3:00pm
EWEB Conference Room—Eugene

The following is a generic agenda. Issues are constantly changing and a more detailed agenda will be mailed to OSEIA members when it is developed.

1. Introductions (11:00am)
2. Welcome new members
3. Approve previous meeting notes
4. Treasurers report
5. Executive Directors report
6. Membership Issues
7. Announcements

Contact Information

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Vincent McClellan	Energy Design	(541) 937-8284	Larry Elliot	Solar Tech	(541) 545-3201
Bob Maynard	Energy Outfitters	(541) 476-4200	Pat Stapleton	Stapleton Electric of Oregon	(503) 970-2976
Tom Scott	Energy Service Co., The	(541) 302-6808	Dave Robison	Stellar Processes	(503) 827-8336
Brian Bowman	Energy Smart Systems LLC	(503) 885-9571	Ron Summers	Summers Solar Systems	(541) 683-4014
Don Spiek	EWEB, Attn: E.M.S.	(541) 484-1125	Rick Reed	Sun Earth Inc.	(909) 605-5610
Gary Higbee	Windstream Solar	(541) 607-1818	Paul Israel	Sunlight Solar Energy	(541) 322-1910
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Christel Bieri	Heliodyne, Inc	(510) 237-9614	Frank Vignola	U of O Solar Radiation Monitoring Lab	(541) 346-4745
Joe Schwartz	Home Power Magazine	(541) 512-9281	Leonard O'Donovan	West Linn Electrical, Inc.	(503) 656-4375
Bob Klecha	Idaho County Solar	(208) 983-0820	Kerry Whitehead		(541) 592-3958
Dave Reuter		(541) 343-3257			

OSEI A Minutes

Tuesday, April 8, 2003

Prepared by John McIntosh, Reviewed by Jon Miller

The meeting was called to order on April 8, 2003 at 11 p.m.

The meeting was held at 500 E. 4th Ave., Eugene OR

The notice for the meeting was given more than seven days in advance by email, in person at the previous meeting, and by phone.

The members present for the meeting were:

John Patterson
Bob-O Schultze
Bob Maynard
Len O'Donovan
Gary Higbee
Christopher Dymond
Steve Musser
Joe Savage
David Parker
John McIntosh
Don Spiek
Sidney Clouston
Philip Tussing
Scott Crawford
Steve Still
Andrew Koyaanisqatsi
Doug Boleyn
Frank Vignola

A quorum was present because there are currently 30 voting members and 15 were present at this meeting.

I. REPORTS AND DISCUSSIONS

1. Executive Directors Report on Programs and Activities: A report was given and discussed regarding the Corporation's programs and activities.
2. A report was given on the Oregon State Carbon Tax proposal.
3. A discussion was held on membership classes.
4. Several comments were made concerning the layout of the treasures report. The report should include a more detailed and typical 'current balance' = 'money in' minus 'money out' spreadsheet with all expenses accounted for.
   a. Also, OSEIA should have a finance committee to look into fund raising and expenses.
5. Possible legislative items for 2005 legislative cycle were discussed.
   a. The consensus was to begin developing input for new legislation in 2004 for the 2005 session.
   b. Changing the net metering law to require more equitable pay for excess kwh
6. The OSEIA newsletter was discussed. It was agreed that it was beneficial and much thanks goes out to Frank Vignola for taking this effort on. In general the members agreed that most of the newsletter distribution would be electronic to keep the costs down. A suggestion was made to include advertising to offset costs of any printing and mailouts.
7. It was noted that, according to OSEIA bylaws, only 10% of voting members are required to be present to constitute a quorum. That means that of 30 voting members, we only need 3 present to vote on items! The bylaws should be changed to require a higher number of members present.
8. Agenda items for the next meeting were suggested:
   a. ETO Arbitration
   b. ETO Thermal program
   c. OSEIA Fund raising / spending
   d. Solar Plumbing license
9. The next meeting date was set for August 5th 11am at the same place – Eugene EWEB conference area.

II. ACTIONS

1. Prior Meeting Minutes: The following motion was made, seconded and passed:

   RESOLVED to accept the minutes of the prior meeting as written.

2. Treasurer's Report: The following motion was made, seconded and passed:

   RESOLVED to accept the treasurer's report as written.

3. Election of Board Members: The following motion was made, seconded, and passed:

   RESOLVED to elect the following members of the Board of Directors of the organization:

   Tom Scott, Dave Parker, John McIntosh, Bob-O Schultze.

4. Election of Alternate Board Members: The following motion was made, seconded, and passed:

   RESOLVED to elect the following members as alternates to the Board of Directors of the organization:

   Andrew Koyaanisqatsi, Doug Boleyn, Don Spiek.

   Alternate Directors have indicated their willingness in advance to be elected to the Board of Directors should there be a vacancy. They are to be included in all discussions and correspondence. They are not voting members of the Board of Directors.

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Grid-Tie Rises in Oregon

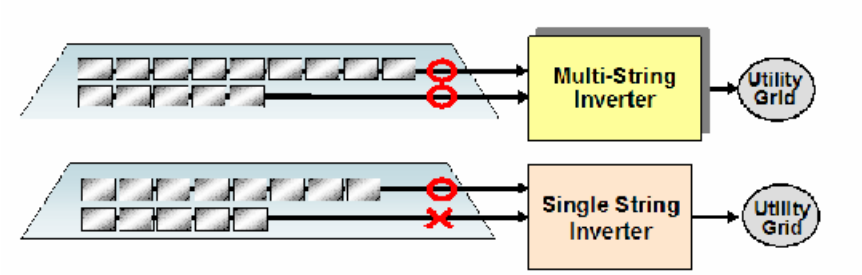

Fig. 1: Schematic for a SunVista multi-string inverter compared with a single string inverter.

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equipment is operational it should supply valuable performance information on photovoltaics in a grid tied setting for our industry.

According to Arthur Rudin, Director of Engineering for Sharp Solar Division, the SunVista is a mature design with over 60,000 installations worldwide over the last eight years.

The main advantage of the SunVista is that it allows 3 separate strings of differing orientations and sizes to feed into the same inverter with a large voltage "window". Each input has its own maximum power point tracking circuit. In many cases this allows the sizing of a larger system using multiple roof orientations, strings of different modules or different size strings.

Previous technology required the costly use of multiple small inverters dedicated to each orientation. With the other dedicated grid-tie inverters having arrays on different tilts and orientations would reduce system output as the array receiving less sunlight would degrade the output of the fully energized array below what it would produce if the shaded array were omitted. This is according to Gord Petroski, SunVista product manager for Energy Outfitters and former Western Regional VP for Xantrex (See *Fig. 1).*

SunVista inverter along with disconnect and meters

According to Bob the system should produce 20kWh on a clear summer day once the dust from construction next door subsides; as the Maynard household only consumes 15kWh on a typical day a surplus is expected. As PacifiCorp gives unfavorable treatment to net excess generation at the end of the month an electric hot tub may be in cards!

Recently the PacifiCorp meter reader came by and was perplexed. There were **two** meters, one belonging to the utility and the second required for the energy trust. Even worse the PacifiCorp was a Digital Bi-directional Meter. He was not trained to read the meter installed days earlier. The meter reader started talking with Barb Maynard who explained the system and bragged about how it would eliminate her bill. He stated that "Systems like this will put us out of business". Barb replied "systems like this will keep you busy"

As PV matures the scene that played out at the Maynard household is likely to occur many times all across Oregon and the entire US. Long term the trend is quite clear as PV continues to get cheaper at 3-5% of year while the cost of grid electricity increases 1-3% annually. Another quality product such as the SunVista entering the marketplace should ensure healthy competition in the grid-tied inverter market.

SunVista monitor / solar power conditioner display

Energy Trust Shade Evaluation Form

by Frank Vignola

Energy Trust Shade Effect Evaluation Form

Job Name: _____
Contractor: _____
Date: _____
Array Tilt: _____
Array Orientation: _____
Zip Code of Site: _____

The sun path chart to the right is for a solar electric system located in Portland, Oregon tilted 22.5 degrees with a 180 degree azimuthal orientation. The annual AC output for a 1 kW peak DC system with these characteristics is about 1103 kWhr/yr.

For comparison, a system with near optimum tilt and orientation (32 degree tilt and 180 degree azimuth) will produce approximately 1119 kWhr/yr.

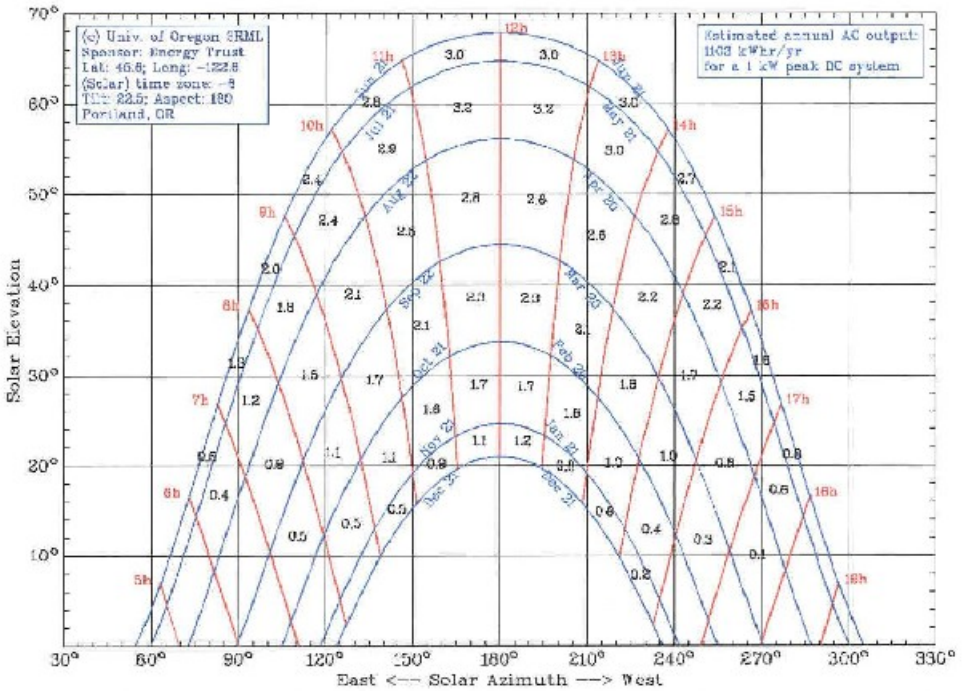
At Portland, a system oriented as in the sun path chart to the right will produce 98% of the annual electricity produced by an optimally oriented system.

Draw the horizon on the sun path chart and shade obstructed areas. To calculate the percent reduction due to shading, enter the percentage of system power output shown on the sun path chart for areas shaded by obstructions into the table on the right.

For example, assume the percentage of system power output from 7:00 to 8:00 between September 22 and October 21 is 0.4%, and 50% of that period is shaded. Enter 0.2% in the column under 7-8 and the row labeled Feb-Mar on one side and Sep-Oct on the other. Enter zero for each box where there is no shading. Note that hours are in solar time.

Sum the shading values in each column and enter the total in the bottom row. Sum the bottom row to determine the percent annual shading.

Pct Annual Shading: _____



Period/Hr	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	Period/Hr
May-Jun															Jun-Jul
Apr-May															Jul-Aug
Mar-Apr															Aug-Sep
Feb-Mar															Sep-Oct
Jan-Feb															Oct-Nov
Dec-Jan															Nov-Dec
Sum of Hourly Shading															Sum of Hourly Shading

The University of Oregon Solar Radiation Monitoring Laboratory (UO SRML) has produced shade evaluation forms for the Energy Trust of Oregon photovoltaic program. These forms contain sun path charts with hourly intervals and show the % of the total energy production during each hour for monthly periods. For example in the form shown able, the period between September 22 and October 21 from 10 am to 11 am, will typically produce 2.1% of the total electricity generated over the year by a south facing solar electric system tilted at 22.5° (a 5/12 roof pitch).

By drawing the site's horizon line on the sun path chart and lightly shading the area under the horizon line, one can calculate the effect of shading on the annual production of the system.

A sun path chart plots the path of the sun across the sky. The vertical axis is the elevation of the sun in the sky and the horizontal axis is the azimuthal angle of the sun. An azimuthal angle of 90° is east, 180° is south, and 270° is west. For Portland, Or. on December 21, the sun is lowest in the sky and rises at an azimuthal angle of about 125°, reaches a solar elvation of 21° at noon and sets at an azimuthal angle of 235°. On June 21, the sun is highest in the sky and rises at an azimuthal angle of 75°, reaches a solar elevation of 67° at noon and sets with an azimuthal angle of 305°. Sun path charts can be created on the UO SRML Web site at http:/ / solardata.uoregon.edu/ SunChartProgram.html.

Any object that shades the array from direct sunlight will significantly reduce the amount of electricity produced by the system. These shade evaluation forms help determine when this shading will occur and roughly the amount of electrical production that will be lost when the array is shaded.

These shade evaluation forms are incorporated into the Energy Trust solar electric site evaluation process and will soon be available on the Energy Trust web site as PDF files. Initially the forms are produced for four locations, Medford, Pendleton, Portland, and Redmond, Oregon for tilt ranging from 0°, 22.5°, 45°, 75°, and 90° and azmuthal angles from 90°, 120°, 180°, 240°, and 270°. Forms for other locations such as Astoria and North Bend may be produced if there is a demand. The shade evaluation forms will soon be downloaded from the Energy Trust Website at: http://energytrust.org.

The "Bright Way" program for solar water heating systems developed simlar forms for shade evaluation. Therefore one should also be able to use these forms for solar thermal system

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OSEI A Minutes

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5. Student Membership: The following motion was made, seconded and passed:

   RESOLVED to adjust the "Student Membership" class dues to $35.00 annually.

6. Manufacturer Membership Class: The following motion was made, seconded and passed:

   RESOLVED to change the by-laws of the corporation to create a new membership class – Manufacturer. The by-laws shall be changed to include the following:

   Article III, Section 1, Item "f" shall read:

   "Manufacturer Membership" shall consist of any person, organization, company or corporation with gross annual renewable resource energy product manufacturing and sales of $5,000,000 or greater.

   Article II, Section 3, Item "f" shall read:

   "Manufacturer Membership" shall consist of any person, organization, company or corporation with gross annual renewable resource energy product manufacturing and sales of $5,000,000 or greater.

7. Manufacturer Membership Class Dues: The following motion was made, seconded and passed:

   RESOLVED to establish the annual dues for the Non-Voting Manufacturer Membership class at $750 and for the Voting Manufacturer Membership class at $1,500.

8. Utility Membership Class Dues: The following motion was made, seconded and passed:

   RESOLVED to change the annual dues for the Utility Membership class to $0.01 per installed electric meter. Each Utility membership class member shall pay no less than $300 per year and no more than $1,500 per year regardless of number of installed electric meters.

9. Finance Sub-Committee: The following motion was made, seconded and passed:

   RESOLVED to create a finance sub-committee consisting of the following members: Sidney Clouston, Andrew Bortz, Lynn O'Donovan, Frank Vignola.

10. New Members: The following motion was made, seconded and passed:

    RESOLVED to accept as new Associate Members the following individuals:

    David Reuter, Larry Elliot, Burr Boutwell.

11. Carbon Tax: The following motion was made, seconded and passed:

    RESOLVED that OSEIA is officially supporting the proposed "Carbon Tax" legislation.

12. Membership in EORENW: The following motion was made, seconded and passed:

    RESOLVED that OSEIA would become a member of EORENEW.

Adjournment: There being no further business, the meeting was adjourned.

50th Anniversary of the Silicon Solar Cell

2003 – 2004 will be celebrations for the 50th anniversary of the silicon solar cell. Oregon should be celebrating because one of the inventors (Gerald Pearson) of the silicon solar cell was born and grew up in the Oregon and two others (Pearson and Daryl Chapin) went to school at Willamette University.

This information comes from John Perlin, author of From Space to Earth, the story of solar electricity, and were part of the display he helped put together for the World Photovoltaic Energy Conversion Conference in Osaka, Japan. A picture of John and the display are to the right.

SEIA UPDATE

By Glenn Hamer

It appears that a Federal Energy Bill will become law this year – the first bill of its kind since 1992. SEIA is vigorously championing the following provisions:

- A 15 percent residential solar energy tax credit for both solar water heating and photovoltaic equipment. The credit is currently capped at $2,000, though we're seeking to double this - OSEIA's quick and comprehensive letter on this score earlier in the session was extremely helpful on this front.
- A renewable portfolio standard (RPS) that includes all solar technologies, allocates some compensatory resources to wind-poor areas provides additional incentives for distributed renewables, and protects states that adopt standards with solar set-asides (i.e., Arizona and Nevada). We're supporting a provision in the Federal RPS which would provide consumer rebates to consumers interested in solar thermal systems.
- The Oberstar amendment to the House bill, which would authorize $1.25 billion over 5 years to deploy PV on Federal buildings.
- The Woolsey provision to the House bill, which would authorize $120 million to assist states and localities to deploy on-site renewables (including both SWH and PV.)
- Standardized net metering and interconnection language. Both the House and Senate bills include "model" language, but neither requires state compliance. We have developed an amendment which should soon be offered in the Senate to set an enforceable national standard. States would have to adopt this standard unless they affirmatively opted out. The language also increases the commercial system limit from 500 kW to 1 MW.
- Language to allow higher mortgage insurance caps from the Federal government for homes which install solar equipment.
- Federal procurement standard that provides additional incentives for on-site renewables. The Senate Bill provides double credits for electricity generated on-site; it is important for this language to also cover SWH.

On the appropriations front, we're working to secure the highest possible number for the solar program, with the fewest possible unhelpful earmarks. There's a renewed interest at the US Department of Energy to freshen up what is now known as the solar lighting and heating sub account. We also continue to push for a SWH and PV focus to the Administration's Zero Energy Building program.

Energy Star Water Heating Criteria

from Peter Lowenthal

Dear Water Heater Stakeholder,

On June 11, 2003, notice was sent that the Department of Energy had scheduled a stakeholder meeting for August 12, 2003, to discuss extending the ENERGY STAR program to include water heaters. The Department has decided to give further consideration to the development of ENERGY STAR water heater criteria and is retracting the June 11 notice and is canceling the August 12 meeting. We regret any inconvenience this retraction may cause.

The Department intends to evaluate a range of voluntary approaches to promote energy efficient water heating technologies, including the ENERGY STAR program. Before the Department proceeds with a specific approach, it will seek public input.

We will continue to keep you notified of further developments. If you have any questions, you can contact Richard Karney at (202) 586-9449 or richard.karney@ee.doe.gov.

[*Ed. Note: This is from an email from Peter Lowenthal.*]

Natural Gas Prices Increase

The United States has finally reached a level of natural gas consumption that roughly equals its production capacity. Since 1998, almost all new electrical generation has resulted from gas fired plants and more such plants are being planned. As a result, natural gas prices have doubled from $3.50 a million BTU to around $6.00 a million BTU.

Imports of natural gas require liquefication. The cost of liquefication and the construction of terminals to safely handle the gas is expensive. Therefore we may be entering a new period where the economics of renewable look even more promising. The era of cheap fossil fuels may be drawing to a close.

Energy Trust Shade Evaluation Form

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evaluations. These forms would especially be useful when deciding where to locate the solar collector if shading is a problem.

Shortly these forms and information on how to use these forms will be available on the Energy Trust Web site.

Letter from Executive Director

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We need to work with utility, government, and program personnel to increase the effectiveness of these incentives for both the consumer and the contractor. Only when both the consumer and contractor benefit will the incentive be successful. The consumer benefits by saving money, the contractor benefits by increasing sales, and Oregon benefits by increasing its clean energy supply.

If you have a local program in your area that is not being used, for any reason, please let me know. Using incentives as an effective marketing tool to increase Oregon's clean energy supply should be one of our highest priorities.

Random Notes

The Renewable Advisory Committee of the Energy Trust of Oregon approved funding for a 112 kW system. The proposal now goes before the Energy Trust Board.

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The American Solar Energy Society's is June 21-26, 2003 in Austin, Texas. Several OSEIA members will be attending this meeting and advertising the 2004 ASES conference that will be help in Portland, Oregon July 11-14, 2004.

……...

The Oregon Million Solar Roofs Coalition just put together another proposal that includes funds for organizing limited renewable energy technician education.

OSEIA

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