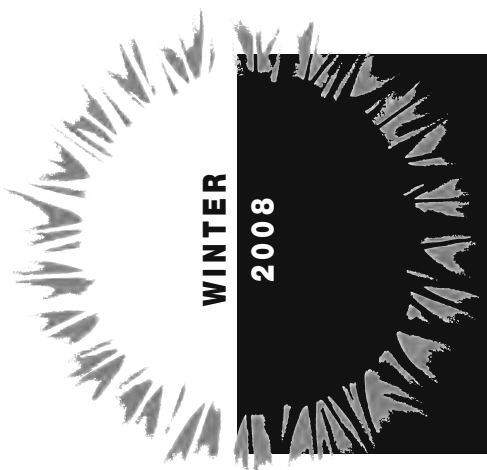


REFLECTOR

promoting the wise use of sustainable and non-polluting resources



SOLAR The SO S

"We don't believe anyone should have to choose between food or medicine and paying their utility bills," says Rays of Hope Founder, Effie Brunson.

The National Low Income Home Energy Assistance Program (LIHEAP) provided \$2.1 billion in heating and cooling assistance in 2005 to more than 4.9 million low-income households. A survey of those households found that during the prior five years, due to their energy bills, 57% of non-elderly owners went without medical or dental care; 25% could not make their rent or mortgage payment; 24% went without food for at least one day.

Rays of Hope is a project that was started in Austin, TX to provide electricity via solar PV to the city's most vulnerable

which will give the public and members of the community the chance to see how this technology works.

Rays of Hope is developing relationships with local affordable-housing providers and charitable organizations such as American YouthWorks Casa Verde Builders, 1 House at a Time, Meals on Wheels and More and others. By teaching participants how to install their own solar systems



The crew from Casa Verde Builders

Follow the link below to help Rays of Hope install solar panels for a needy local family. Each \$25 donated will purchase approximately 17 watts of the 3kW solar array planned for installation in March.

For more information about the project, and to sign up for future workshops, go to www.raysofhopeaustin.com

Casa Verde Builders (CVB) is an award-winning, project-based education program, at American YouthWorks (AYW), providing participants with hands-on construction skills and applied academics. To learn more go to: www.americanyouthworks.org



populations free of charge. Through fundraising and partnering with other non-profits and solar providers, Rays of Hope will provide the equipment for weekend hands-on installation workshops

while installing the PV panels for a low-income family, Rays of Hope is working to raise the awareness of this technology, particularly in the populations where it is needed the most.



Board elections and TXSES Annual Meeting report



TXSES members gathered around the fire as the afternoon temperature dropped unexpectedly



TXSES Chair, Carol Harwell, and Executive Director, Natalie Marquis applaud the many volunteers who keep TXSES alive

Newsletter Staff

Editors: Carol Harwell
Heidi Schrab

Columnists: Carol Harwell
Chuck Wright

Contributing Authors: Natalie Marquis
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Board of Directors

Officers:

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Jackie O'Keefe, Secretary
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Heidi Schrab, Treasurer
Heidi@GreenMountain.com

Members:

Richard Amato
Jim Duncan (North Texas Renewable Energy Group)
Robert Foster (El Paso Solar Energy Assoc.)
John Gardner (Houston Renewable Energy Group)
Garland Scott (Solar San Antonio)
Brigid Shea
Lucy Stolzenburg
Gary C. Vliet (Ex-Officio)
Fred Yebra

The nominees for the TXSES Board of Directors were confirmed in a ballot count at the end of December. With a total ballot count of 79 each candidate received either 32 or 33 votes, a virtual tie across the board, the results were as follows:

2008 /2009 Term : Jackie O'Keefe and Heidi Schrab

Both Heidi and Jackie have served previous terms on the Board. Jackie, employed by The Natural Gardner, has been a superb recorder of meetings as our Secretary. Heidi, who works for Green Mountain Energy, has officiated with all things financial as Treasurer. She is also coordinator/editor of the Solar Reflector.

2008 Term (filling vacancies): Brigid Shea and Lucy Stolzenburg

Brigid is president of Brigid Shea & Associates, an environmental and public policy consulting firm. Lucy is a veteran of the local real estate industry.

The TXSES Annual Meeting was held December 9th at the home of our Executive Director Natalie Marquis. There was a good turnout of members who enjoyed refreshments and some time to reconnect before getting down to business. The central fireplace was very popular as we experienced a sudden 40 degree drop in temperature.

Many dedicate volunteers were thanked with token gifts of fine chocolate and energy efficient/solar gadgets and widgeits.

Another busy year is planned for '08 and as always we need your assistance in making all of our events a success. Go to TXSES.org to see how you can help!

Chairman's Corner

with Carol A. Harwell



Spring Check-in

Spring is in the air and the Texas sun is shining brightly. TXSES is experiencing a period of new growth, too. With the help of a volunteer, Bill Glass, we are now able to automate and go paperless for our renewal process. For those of you, my own husband included, who don't have email, or just prefer the

trusted hard copy mailing method—worry not. We are keeping that dual track of renewing an option. What we are doing is giving you, our members, a choice about how you communicate with us and we invite you to join us in our effort to conserve paper, ink, the fossil fuels of mail delivery, etc. If you haven't received an email from us in the past six months we do not have your

correct information. Please take this time to email us at info@txses.org and we'll get you into our system for announcements about all that we are doing and how you can get involved or get your questions answered. And we take suggestions at the above email address, too. So, if you would like us to be doing something we are not, or if you feel we are doing something we shouldn't be, please speak up! This is your organization. We are here to make sure the mission of outreach and education is successful, but we need your talent and expertise to guide us.

Last year Earth Share of Texas raised almost seven thousand dollars on behalf of TXSES. Roughly two thousand of those dollars were raised in the month of April during the HEB tear-pad campaign in central Texas HEB and Central Market stores. Beginning April 1st, and

throughout the month of April, Earth Share will again be running this fundraising campaign, much expanded. It will now include the four Central Markets in the DFW area, Houston and Galveston HEBs, Central Market coastal stores from Corpus Christi to El Paso, and all of the stores that participated last year. It's a simple easy way to give back every time you checkout at the grocery store. It helps more than just TXSES, it helps all environmental organizations. (See related article right.)

Join us in making 2008 our best year ever!

See you on the trails,

Carol Harwell

Carol Harwell is the GreenChoice® Manager at Austin Energy

Member Profile - John Gardner

Outstanding Efficiency

John sits on the TXSES Board of Directors as the Houston Renewable Energy Group representative. John's home was featured a few years ago in the Solar Reflector, however he has continued to increase the size of the system and recently completed an energy audit with impressive results.

In this day and age of many people simply giving lip service to energy efficiency, I was pleased to see that one of our long time members of TXSES and HREG actually lives by what he preaches. Tony W. DeRamus of Beacon Energy Solutions had an opportunity to visit John Gardner's house recently to perform an energy rating/audit. This was an unusual case because John simply wanted to verify how well his house performed against an Energy Star certified home versus many of the existing homes we visit who could really use an energy efficiency makeover.

A few of the highlights on John's home:

- The site selection and directional orientation were chosen to minimize the exposure to the afternoon sun and maximize the clean collection area for the rainwater.
- The continuous porch, window awnings, placement of the carport and breezeway provide further protection. To the south are the hot water collectors and the PV arrays.
- A white standing seam metal roof was chosen to provide maximum heat reflection and a clean surface for the rainwater collection.
- The metal roofing was laid down over a plywood deck with radiant barrier.
- Continuous ridge and soffit vents were installed to keep the attic temperature as close as possible to the outside ambient temperature.
- The steep roof pitch resulted in a tall attic space to keep hot air off the ceiling.
- R-30 fiberglass insulation was used in the attic. The A/C and heating system used rigid air ducts insulated with two inches of fiberglass. R-13 fiberglass insulation was used in the walls. Formaldehyde-free fiberglass insulation was used in the attic and walls.
- Skin vent construction was utilized for all external walls, this provided a 3/4 inch air space between the sheathing and the siding.
- Tyvek housewrap was used as a moisture barrier over the sheathing.
- Low "E" double pane vinyl frame windows were used on all side of the house. Green building materials were

used in the construction of the home based on a compromise of cost and availability. Ferro-cement siding, fascia, soffit and trim were used for its rot-proof nature and excellent fire rating.

- Zero VOC paint was used for the interior walls and low VOC paint was used on the external siding and trim.
- Energy Star appliances were used where available. These included: 14 SEER A/C, dish washer and front loading washing machine.

John's house not only beat a typical Energy Star home by 30%, he is producing his own energy with both wind and solar. He is also conserving water with a rain water collection system. If people could see his electric and gas bills, they would probably think he is living in a shoe box! Thanks John. This is awesome.

John's Hybrid Solar Wind system:

The hybrid solar and wind energy system is composed of the following components:

- 1kW XL-1 Bergey 24 VDC wind turbine and control box
- Trace SW4024 inverter/charger (24VDC input/120 VAC output)
- Trace C-60 Charge controller
- 750 Watt solar PV array (24 VDC)
- (8)Trojan T-105 6 VDC storage batteries (450 Ah)



Control Central with the inverters, charge controllers and disconnects



John's house with the solar thermal panels on the right and wind turbine out back

VIEW FROM THE STATES

Texas gets a Clean Energy Park, and works toward a renewable energy policy

Everything's bigger in Texas. The sun shines more than 200 days a year here; on about 64 percent more land area than even California. So with all the sun exposure and all the potential for solar energy production, what is the current state of our state?

The answer is depressing but not defeating. While the state leads the nation in wind power development, we still don't have a state-wide solar policy and Austin Energy remains the only utility in the state offering aggressive rebates for photovoltaic installations for both commercial and residential customers. Despite a grassroots effort to kill 11 proposed coal-fired power plants, the coal plants are not yet dead. On the other hand, at the end of January, Gov. Rick Perry assigned \$600,000 for the development of a Clean Energy Park in southeast Austin. The 140-acre park, to be completed by 2010, will be the first of its kind in Texas and will be a hub for research, business and training.

What does the park mean for Texas? B.J. Stanbery, CEO of Austin-based solar energy company Helio Volt Corp., has been a key force behind getting the park off the ground. Stanbery said Helio Volt "expects to be joined by a collaborative community of academic and industrial partners in developing the future of smart, sustainable solar-powered architecture." And there's a familial influence at work in the park's development, too. Stanbery's father, real estate developer Bill Stanbery (yes, they spell their last names differently), began work on the park idea three years ago, while sitting on a planning committee for the Greater Austin Chamber of Commerce. Over a year of study, the committee selected the clean energy park as the most significant component toward securing a solar future for Texas.

Solar Policy Needed

Now, says Tom "Smitty" Smith of Public Citizen, an award-winning environmental advocacy organization, in order to catch up to the world in solar energy production and manufacturing, Texas needs a coherent energy policy. To that end, Smitty and others have joined forces to develop a roadmap for a solar policy for the state. The Texas Solar Futures Committee was formed for this specific purpose and is comprised of members from several non-profit groups, including Public Citizen, the Texas Solar Energy Society (TXSES, an ASES chapter) and other local environmental advocates. Together with the Texas Renewable Energy Industries Association (TREIA) and Texas Business for Clean Air (TBCA), the group hosted the first Texas Solar Forum on April 24 and 25 at the Capitol in Austin (www.texassolarforum.org). At the invitation of Governor Rick Perry, Texas business execs, policymakers and legislators heard success stories from governors in other states who have successfully implemented statewide solar policies. From jobs in research and development, to manufacturing, sales and installation, there is a great deal of money to be made and carbon emissions to be reduced by endorsing a strong policy. While policy is the goal, it is by making the business case sound that we know such a policy can be adopted. With the right momentum, we hope it will be on the floor when the legislative session convenes in 2009.

Austin Gets Solar Cities Grant

On another front, Austin was awarded one of 13 Department of Energy Solar Cities Grants. There are four main parts of the grant, which will be administered by

continued next page

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Earth Share of Texas

H-E-B and its Central Texas customers contributed \$25,000 to Earth Share of Texas to support program work of 28 Central Texas environmental and conservation organizations.

Earth Share of Texas was the first environmental organization to be the beneficiary of H-E-B's check-out stand tear pad program. Customers made \$1, \$3 or \$5 contributions as they paid for their groceries during April, in celebration of Earth Day.

Earth Share of Texas supports the work of 70 environmental and conservation organizations, primarily through payroll contribution programs at workplaces throughout Texas.

Edie Muehlberger, Director of Earth Share of Texas, said that among the many

environmental projects to be supported by the H-E-B program are Bat Conservation International's construction of human-made roosts for beneficial bats, Austin Parks Foundation's Shoal Creek Greenbelt improvement project, and several organizations' purchases of conservation easements.

Other Earth Share of Texas organizations to benefit include The Nature Conservancy of Texas, the Hill Country Conservancy, TreeFolks, the **Texas Solar Energy Society**, the Children's Environmental Health Institute, the San Marcos River Foundation and the Texas Bicycle Coalition Education Fund.

For more on Earth Share go to: www.earthshare-texas.org



Business Profile - Lighthouse Solar

Lighthouse Solar's beliefs are prominently displayed on the website (www.LighthouseSolar.us/) and probably ring true for a lot of folks. Lighthouse Solar believes there is nothing more important than making the world a better place for our children. They are an American company that believes in the American dream of liberty, justice and the pursuit of happiness for all, with particular emphasis on "for all". The commitment to innovation and quality combined with highlighting support of local businesses and fair business practices.

Lighthouse Solar is a full service solar services company offering Solar Electric and Solar Thermal solutions for residential and commercial customers; current operations are in Colorado and Texas but there are big plans for expanding. The Lighthouse Solar team of professional installers' goal is to exceed expectations, they guarantee all aspects of your system will be designed and installed to the highest standards of quality and precision. Their mission is to facilitate the use of clean, free and renewable solar energy and help everyone be part of a sustainable solution to America's energy needs.

The professional team is standing by ready to educate us:

- How much does it cost to install a Solar system? What is the payback on a Solar system?

- Will a Solar system increase the resale value of my home?
- Can I get financing for a Solar system?



PV Panels serve a dual purpose, generating electricity and providing shade on the porch

- Can Solar panels stand up to the wind and severe weather?
- What kind of maintenance is there with a Solar system?
- Can a Solar system lower or eliminate my electric and/or gas bill?

(The FAQ page includes some great calculator/estimator tools and informative links www.lighthouse-solar.us/faq.html)



Connecting the panels on an array which illustrates the scale of the project

Clean Energy con't

Austin Energy and subcontracted to TXSES and Clean Energy Associates, Inc. In the first two parts of the grant, the focus is on education and outreach.

- TXSES, in conjunction with area teachers, will develop curricula for K-3, elementary, middle and high school students pertaining to renewable energy, its sources and technologies and the need for energy conservation.
- Austin Energy will contribute \$180,000 towards installing solar PV systems on six schools. These demonstration sites will allow students to learn first-hand how the technology works. Data loggers will make it possible for all schools to monitor the solar production of the others so that comparisons can be made based on weather conditions and siting.

- The second phase of the grant deals with proactive marketing of Austin Energy's numerous energy efficiency, green building, waste reduction and water conservation programs. TXSES will make 50 presentations to neighborhood groups, churches, and community centers.
- The third phase of the grant will assess the rooftop solar potential in Austin.
- In the final phase, Clean Energy Associates will study the viability of dual transmission lines - transmitting solar energy during the day and wind energy at night. With the favorable wind and sun conditions prevalent throughout west Texas, this study hopes to show how lucrative and efficient renewable energy transmission can be.

GEEK SPEAK

with **Chuck Wright**

Energy Appreciation

Occasionally I converse with others about energy, and when I do, I am usually impressed with how much they take for granted its low cost and instant availability, and how unaware they are of their extreme reliance on it. This seems like a good time to do some numbers...

A few years ago I walked out of the Grand Canyon. It was a long, tiring trek, raising my body weight by about 5000 feet in about 5 hours. A few days later I thought it would be fun (or at least interesting) to calculate how much energy I had used. This was not very hard. I just multiplied my weight, 140 pounds (at the time), by 5000 feet, and the answer was 700,000 foot pounds, or about 0.26 kilowatt hours.

I currently pay around 14 cents per kilowatt hour of electricity, meaning that my 5 hours of hard, hot, sweaty labor were only equivalent to 4 cents worth of electricity!! Granted, the true situation is more complex, with various efficiency factors to be considered, and the fact that I also hiked 9 miles in addition to the vertical climb, but the point is that we can and do replace enormous amounts of human labor for very little money, almost for free in fact.

Over this 5 hours, I felt like I had worked pretty hard. Yet, when I calculated the power that I was generating (0.26 kWh / 5 hours ~ = 50 watts), it was only enough to light a 50 watt light bulb. How disappointing! Let's compare this to the power required to drive a car down the road. A highly efficient electric car might move 5 miles on a kilowatt hour of electricity. If it is moving at 50 miles per hour, we can divide the speed by the first number to determine that the car is using about 10,000 watts (if you like horsepower, divide by 746 to get 13.4) to cruise down the road. The answer is that if the car had peddles, and I could peddle 200 times as hard as I really can, I could make that car go down the road at 50 MPH for a few hours.

In an effort to convey the value of our artificial energy sources, some people use the concept of "energy slaves". When they add up all of the energy that we use to heat and cool our buildings, grow food, move ourselves, and manufacture products that we use, and put this in terms of human labor, they conclude that each of us in the U.S. has at our personal service as much energy as we could get from around 200 human slaves.

TXSES would like to thank the following members for their generous donations which funded lunch for teachers attending the SECO grant education workshops:

James Lampasona, ProcessVantage
John Gardner, Houston Renewable Energy Group's representative to TXSES
Peter Pfeiffer, Barley & Pfeiffer Architects

The SECO grant allowed TXSES to further its goal of education and community outreach by sending experts across the state, providing curriculum training and hands on activities in renewable energy to K-12 teachers. It was not uncommon for these educators to travel long distances and to provide lunch on site was a considerable benefit. Thank you gentlemen for your generosity.



We could go on and on calculating the value of this or that use of artificial energy sources. The answer is always similar, and always extreme. Point made. What shall we do with this? Well, public discussion is more and more focussed on energy, whether it has to do with the price of gasoline or the need to address climate change, or energy independence for the sake of national security. In order to have a meaningful discussion about energy, one needs to have some perspective.

Perhaps \$3 a gallon seems expensive for gasoline. Does it still seem expensive if we realize that the 35 kilowatt hours of heat energy in this gallon of gasoline is converted (at 10 percent efficiency) to 3.5 kilowatt hours of mechanical energy in a car, more than we would produce doing hard manual labor for a week? How much is this amount of energy really worth to you (ignoring the fact that it is currently almost free)? We really need to talk about energy not just in terms of its price, but in terms of its value.

After value, we should then talk about cost. Its cost is different from its price, and includes the environmental effects of generating it, such as air pollution and water pollution and their attendant health effects, and the cost of dealing with those, and the possibly catastrophic effects of climate change. It includes the military costs of protecting energy supply far from home, and the personal costs to those doing the protecting and their families, and the long term cost to our national security of doing that. The cost adds up, and it is high, far more than \$3 a gallon for gasoline.

Renewable energy sources generally come at a higher monetary price than "conventional" sources. They lack most of the hidden costs listed above, so they are more honest as energy sources. And of course, they work just fine at displacing our human energy.

Do you appreciate the value of the energy that you use? How about its cost? Think about it.

Resources:

Energy conversions:
chuck-wright.com/calculators/watts.html

Fun energy conversions:
wattsonschoools.com/calculator.htm

Energy Slave discussion:
www.manicore.com/anglais/documentation_a/slaves.html



TXSES Chapter News:

Chapter contacts:

El Paso Solar Energy Society (EPSEA)
Robert Foster, Board Representative
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rfoster@nmsu.edu

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Jim Duncan, Board Representative
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www.txses.org/ntreg

Solar San Antonio
Bill Sinkin, Chairman
210-354-0236
www.solarsanantonio.org



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Membership Form

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Annual Dues

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_____ Chapter
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ASES Membership

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Business Membership:

- (Includes hot link to business web site)
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*recognized in quarterly newsletter
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School Fund:

- \$25 Check here to contribute an additional \$25 to the TXSES school fund.
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You can pay by credit card on line at the "Join TXSES" link on www.txses.org

Texas Solar Energy Society wishes to thank the following members who have contributed to us with \$100 or more level memberships:

Robert Foster, Tom Fitzpatrick, Teresa Hershey, Carol Harwell, Natalie Marquis, Jane Pulaski, Heidi Schrab, Chuck Wright & Judy Pearson-Wright

The following companies have chosen to support the Texas Solar Energy Society's educational mission by joining at the business level:

Michelle Courter, William Hollis Fitch III, Janet Hughes, Milton Odom, Gary Gene Olp, William Parker, James Roemer, Ken Starcher, Alternative Energy Institute, Beacon Energy Solutions, Big Grass Bamboo Co., Kirksey, Lighthouse Solar, Suntricity Solar Electric, TodaysWater.Com, Venti Energy, Z Works Design/Build

And special thanks and kudos to the following business for joining at the higher Business levels of support:

Alternative Power Solutions/Ralph Parrott ralph.parrott@apowersolutions.com www.apowersolutions.com
Barley Pfeiffer Architects/Peter Pfeiffer greenarch@aol.com www.barleypfeiffer.com
City of Austin/ Carol Harwell carol.harwell@austinenergy.com www.austinenergy.com
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NewPoint Energy Solutions /Jaclynn Richardson jrichardson@newpointenergy.com www.newpointenergy.com
Solarplex of Texas/ Gary Trainer gary@solarplexoftexas.com www.solarplexoftexas.com
Texas Solar Power Company/Craig Overmiller info@txspc.com www.txspc.com

Randalls/Tom Thumb Good Neighbor Program - 11394

At the service desk of your Randalls or Tom Thumb supermarket, request the number 11394 be the designated charity for your Randalls/Tom Thumb card. Texas Solar Energy Society automatically receives a donation from the Randalls/Tom Thumb Good Neighbor Program for 1% of your total grocery bill.

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The Texas Solar Energy Society (TXSES) was founded in 1976 and is a non-profit educational organization formed to increase the awareness of the potential of solar and other renewable energy applications and to promote the wise use of these sustainable and non-polluting resources.

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Visit our web site at:
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