



Solar Washington Newsletter

AUTUMN EQUINOX 2006

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100 MPG Car?

That is the goal set by a for-profit charity fund, created by Google. It was announced this summer that Google is starting a research effort into a hybrid of ethanol, plug-in electric & gas, car. (Post Intelligencer)

New Type of Battery

MIT has announced a new type of lithium nickel manganese oxide battery that could become a cheaper alternative to the batteries that now power hybrid electric cars. It also charges & discharges ten times faster.

Home Depot

Home Depot is selling solar attic fans. Can solar panels be far behind?

Colorado Consumers Will Save

A new study says that energy consumers in Colorado will save more than \$251 million over the next 20 years because of the utility's current fleet of wind plants. (Renewable Energy Access)

Birth of a Solar Washington Chapter in Bellingham

It has been two years since the Solar Washington board challenged itself to grow subchapters (Colorado ASES state chapter CRES has done this successfully). The board has traveled the state, participating in public events and meeting with local folks. Bellingham is the second community (we also have a Southwest Chapter) to meet the challenge of organizing and formalize their relationship with the state chapter. See

[\[http://www.solarwashington.org/newsletters/0609/B-Ham.pdf\]](http://www.solarwashington.org/newsletters/0609/B-Ham.pdf)



Community Renewable Energy

For decades, the conventional wisdom about developing energy projects in the U.S. has been that "big" always meant cheaper, and therefore better, projects. This produced what has become our modern centralized electric power system, fueled primarily by coal, natural gas and nuclear power. See [\[http://www.solarwashington.org/newsletters/0609/CommRE.pdf\]](http://www.solarwashington.org/newsletters/0609/CommRE.pdf)

2nd Annual Solar Drag Race on 6/24/2006



Unlike other races that you may be familiar with, solar drag racing is different. Using no batteries or other pre-charged energy devices solar drag racing uses only sunlight that can be captured by the vehicle while it is running. Shown at left is an attempt to cool PV panels to increase efficiency just before the race. See [\[http://www.solarwashington.org/newsletters/0609/Drag.pdf\]](http://www.solarwashington.org/newsletters/0609/Drag.pdf)

Boehm Home: Not Just a House

A popular home building trend in our state seems to be homeowners buying property with acreage and then planning (over a period of years) for the design and construction of a home that they will live in for many years (many say planning for retirement). The Boehm home, an example of this strategy, will be featured on the Clark/Cowlitz Solar Tour. See

[\[http://www.solarwashington.org/newsletters/0609/Boehm.pdf\]](http://www.solarwashington.org/newsletters/0609/Boehm.pdf)

California Enacts Landmark Global Warming Measure

In California, Governor Arnold Schwarzenegger has signed a landmark measure to curb global warming. The law commits California to the goal of cutting greenhouse gas emissions 25 percent by 2020. It also mandates that California establish emission controls on large industrial sectors including utilities, oil refineries and cement manufacturing. The legislation is widely considered the country's most ambitious effort so far to combat global warming. (DemocracyNow.org)

Energy Report Released

The Worldwatch Institute and the Center for American Progress released a report on 9/18/2006 titled, "American Energy: The Renewable Path to Energy Security." Go to <http://americanenergynow.org>

We're Solar Washington

Solar Washington is a chapter of the American Solar Energy Society. We're a private, not-for-profit association for people and organizations interested in solar power, energy efficiency and renewable energy.

Website and email:

www.solarwashington.org

info@solarwashington.org

Phone: (206) 222-7113

Next meeting: Please watch our website for the next meeting. We hope to see you then.

Our President's Column

Energy Answers, Celebrating and Tour

Read about renewable energy's answer to the challenge of global warming, climate change and shortage of fossil fuels. Pamela Burton is celebrating the first year living with a 6 kilowatt roof that produced 6261kWh and earned \$616.45 during just 9 months of the first year from the state incentive program. The annual Washington State ASES solar tour has grown tremendously in six years from four sites in King County to over 165 sites in 22 regions. Hope you can take the tour. See

[\[http://www.solarwashington.org/newsletters/0609/Prez.pdf\]](http://www.solarwashington.org/newsletters/0609/Prez.pdf)

Biodiesel: A Solar Fuel!



This year's solar tour will feature sites with alternatively fueled vehicles including Dr. Dan's Biodiesel station in Ballard. There's also Lyle Rudensey, M.Ed., aka "BioLyle" in Seattle who consults, and gives classes, workshops, and school assemblies about biodiesel. He will be showing his PV, solar water heater, and

biodiesel systems as part of the Solar Tour. See

[\[http://www.solarwashington.org/newsletters/0609/BioD.pdf\]](http://www.solarwashington.org/newsletters/0609/BioD.pdf)

Solar Power Case Study: An Old Idea with New Economics

John Watts has represented the third ward on the Bellingham City Council since 1999. His main topic of interest – as growth occurs – is determining how to preserve our quality of life, including the natural environment. The Watts/Casey Home is one of the homes featured on this year's Bellingham Solar Tour. See

[\[http://www.solarwashington.org/newsletters/0609/Watts.pdf\]](http://www.solarwashington.org/newsletters/0609/Watts.pdf)

Future of Message Board In Question

Webmaster George Meyer talks about what's happening with our Message Board. See

[\[http://www.solarwashington.org/newsletters/0609/Web.pdf\]](http://www.solarwashington.org/newsletters/0609/Web.pdf)

Last minute addition - Sad News

Dr. Iris Ovshinsky, co-founder, Vice President, and director of Energy Conversion Devices, Inc., died at her Michigan home August 16. She and her husband Stan were featured in the recent film "Who Killed the Electric Car?" See

[\[http://www.solarwashington.org/newsletters/0609/IrisO.pdf\]](http://www.solarwashington.org/newsletters/0609/IrisO.pdf)

Birth of a Solar Washington Chapter in Bellingham

It has been two years since the Solar Washington board challenged itself to grow subchapters (Colorado ASES state chapter CRES has done this successfully). The board has traveled the state, participating in public events and meeting with local folks. Bellingham is the second community (we also have a Southwest chapter) to meet the challenge of organizing as a chapter and to formalize their relationship with the state chapter.

Let's Create the Demand!

By Shannon Maris, director
Bellingham Chapter of Solar WA

That is the phrase that started the Bellingham Chapter of Solar WA. It was a beautiful sunny afternoon in August and Solar WA was hosting their monthly meeting at the Bellingham Coop Connections Building. Hosted by none other than Solar WA President, Pam Burton, and our local, long-time advocate and solar business owner, Tim Abate. The meeting was advertised on post cards at a house with solar panels that Tim installed. It was a house on the Imagine This! Home Tour by our local sustainable business organization - Sustainable Connections.

The home tour is a popular event and it just so happened four houses on the tour that year had some sort of solar feature. Well, a lot of people must have picked up that postcard because about 25 people crammed into the room to attend the solar meeting when most were out at the beach with a picnic basket. Noticing the impressive turn-out Pam stated it only takes 5 interested folks to start a local chapter.... Then some one suggested she ask for a show of hands of who would be interested in seeing a Bellingham chapter started and a good portion of hands when up! "Fabulous", I thought. It was suggested to copy the sign-in sheet and contact those on the list to see who would like to get involved. An e-mail was sent out and six folks came forward as possible directors, 5 confirmed and we were off and running.

The new directors contacted Pam and met a couple of times informally to discuss our next course of action. We decided to rent a room from the library close to WWU campus one evening a month and booked it for six months. The table was set, now let's see who comes to dinner! Thanks to email, word can get around fast. We printed up more postcards with the meeting info and posted them around town as well as handing them to interested folks. The local newspapers and Co-op paper both publish ads for meetings and non-profits so we post our meetings in those too.

Each month we average 20-30 people attending. Most come regularly, a few new people each time, and all from different walks of life, work, various solar backgrounds, involvement, etc. It has been great! One of the first ideas our directors came up with was to ask those attending what they would like the focus

or our group to be – since we were the directors, what did they want us to direct?! One of our directors who has organized design charities volunteered to lead the next meeting to identify our goals as a group. Everyone got to call out items while two directors wrote down what was called out on big pieces of paper until items started to get repeated often. We also suggested that if anyone think of items after the meeting to email them to me (I manage the membership list). The general consensus that evening was that if our focus was education- then we couldn't go wrong. The directors then met together and took all the pages and grouped them into basic headings- about 20 items. We then presented the group with this list at a following meeting and asked for them to identify their top 3-5 items. Oddly enough we were meeting most of the requested topics, or recently had the opportunity presented to us.

I volunteered to be a director so I could learn more about solar. Being in the building design industry (with a focus on green and sustainable design) all I heard was “Solar doesn't work in Washington.” I wanted to find out if this was true and I wanted to know how to start utilizing renewable energy technology into my projects. (All of the green building programs give credits for renewable energy.) This worked out to be one way to meet the request for education in our group. As I read and research items, new technologies & products, and learn of conferences, workshops, speakers, grants, public projects, etc. that deal with renewable energy or sustainable design, I cut and paste them into an email draft and twice a month I send the e-newsletter to those who have listed their email on our meeting sign-in sheet. The newsletter has gotten pretty popular because a several people who are not in the solar group have requested to be put on the list (one of the members has been forwarding the emails to them, and they might as well just get added to the list!)

The other way our group incorporates education is to have 30-45 mins. of each meeting be a educational presentation. Each of our directors have presented. Some topics have been: The Basics of Solar, The Economics of Solar, Green Building Programs, and Energy and Conservation. A couple members have spoke on past or present projects or technologies they use or install. We had a list of topics we wanted to see for the whole year after our focus charette.

Our directors are great. Each of them have volunteered to take on projects, host the meetings, introduce the speakers, work well together and have been committed. Tim Abate, has held the torch through the “dark (cheap energy) years” and kept solar alive In Bellingham by manning the Solar WA booth each year and having a booth at our local yearly festival Ski to Sea so he is our outreach guy who just won't give up. Dana Brandt, Elect. Engineer and Masters Degree in renewable energy, is a relative newcomer to solar so he has the 21st century vision for solar along with organization and teaching capabilities as well as spear-heading a “web presence” for our chapter thru the Solar WA main webpage. Jack Hardy, is our passive solar and public policy advocate as well as a retired professor in environmental science. Tom Brenton, is our energy

conservation and building technology guy who is working on “value engineering”/ energy modeling and building design, as well as being the one who will offer his living room for our directors meetings. I have a background in non-profits, management and administration as well as building design and technology. I have the “desk job” and can make the phone calls, keep the records and manage emails. Tom, Tim and Dana all keep connected to Solar WA and their members by attending the Seattle meetings as much as they can which keeps us in the loop of our regional chapter.

The fun and opportunities just won't stop! We had a teenager from our local high school attend the meeting because she wants to get solar panels put on the high school for her senior project, we had a fellow from Skagit Community College come up to our booth at Ski to Ski and say ' I wish I found you earlier. We just held a renewable energy fair at the community college and next year I want your whole booth to be there! We had 3 directors, and two members helping out at the booth all day it was so busy! One of our members set up an evacuated tube solar hot water rack next to the booth and Tim brought a couple solar panels and it was like watching moths to a light! The booth also had magazines, Solar WA member info and newsletters, samples of the new residential LED lights, business cards, tax incentive info, list of SEI upcoming classes locally, etc.

Our group also thought getting a public project was important so the general public can see and experience solar at work. It seems the idea floated into the ethers only to return a few months later. Jeffrey Utter attended and presented a proposal for our chapter to become involved with installing some solar modules from a previous public project, to be relocated to the new Sustainable Living Center that the Re-Store is soon to purchase here in Bellingham!

We have had others come to us to further their professional education as their company branches out into solar radiant, or network and collaborate with the other professionals in our group with similar or complimentary technologies. One of the valuable benefits of our group the networking that goes on. At our meetings, one of the first things we do is go around the room and say who were are and what we are interested in so the rest of the group can make a mental note of who is looking for what info and assist new members especially, if they haven't found the people or info they need on their own at the meeting.

We then do the educational presentation and the last 30 minutes or so is left for “open discussion” and milling around so the homeowners can talk to the installers, or the manufacturer can talk to the installer, or the venture capitalist to the inventor. Likewise if information comes up that I know a particular member is interested in I can email them. We have one fellow wanting to get a wind turbine installation on a peak near his home, so he is gathering info, contacts, grants and research towards it's feasibility. We have a couple other folks in our group actively designing homes, one with a focus on zero-energy and has asked for volunteers from our group who are also interested. So we are at the committee

forming stage as ideas come forward and people become involved at different levels.

One committee that has recently formed is interested in getting “fun solar facts” into the local free tabloids to get solar and renewables in people’s minds on a consistent basis. One of my latest ideas is to have a float at next year’s Ski to Sea Parade showcasing renewable energy for our hands-on types! My other goal is to have our affordable housing community land trust project (that is now in design) to include PV or solar hot water either by sponsorship, donation, grant or combination.

It has been fun to have access to a group of like minded individuals especially when events come up in Seattle or Vancouver and someone gets free passes we have folks to share with and/or to contact to start a carpool. Did I mention our field trip list?

In retrospect the most valuable lessons we have learned as a group are:

1. Establish a regular meeting format, time & location
2. Attract and sustain with education (be a resource, ask the new folks “ Did you find what you needed?” And help them!)
3. Network – not a bad word! An asset, a resource, and a way to include and assist others.
4. Listen and learn from everyone in the group. Some of our best ideas have come from our members, as well as where we could improve!

So thank you Pam, for saying “let’s create the demand for clean renewable energy in this town” because that is indeed what we are now focused on doing!

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<http://www.renewableenergyaccess.com/rea/news/reinsider/story?id=45928>

Community Renewable Energy Is Just Around the Corner

by Ted Bernhard



2006-09-11

For decades, the conventional wisdom about developing energy projects in the U.S. has been that "big" always meant cheaper, and therefore better, projects. This produced what has become our modern centralized electric power system fueled primarily by coal, natural gas and nuclear power.

In the mid-to late 1990s, however, the electric power industry began to hear concerns, particularly from the environmental community, about the negative environmental consequences of a system based too heavily on these types of power. As a result, a second wave of thinking arose that called not just for producing the cheapest power at any cost, but also for finding ways to produce cleaner energy from renewable sources such as the wind, sun, biomass, water and geothermal heat -- and to do so on a scale large

One thing is for sure:
when done right,
investment in community
renewables can be highly
profitable for investors.

enough to become a significant portion of utilities energy portfolios.

Although the shift toward large-scale renewable energy has already begun to make a positive difference, today the U.S. finds itself on the verge of another new wave of thinking that incorporates the lessons of the past, but goes beyond merely addressing cost and environmental concerns and seeking maximum output. This new model, which is gradually and quietly rolling into communities across the country, is the distributed "community renewables" model, in which new power projects are smaller and tightly integrated with local communities and local resources in a way that the economics become more favorable and communities are able to participate directly in some of the benefits.

There are three characteristics that distinguish distributed community renewables from the "cheaper at any cost" and the "mega-renewable deployment" mindsets.

1. Increased Community Participation. Unlike a project developed, financed and controlled exclusively by an external developer, community energy projects actively seek to involve local communities as much as realistically possible. This can be done by using fuel from local feedstocks or natural resources; hiring local contractors for construction, administration, management and maintenance roles; giving the local community members an opportunity to invest and share directly in the project's financial benefits (particularly on the back end); creating additional tax revenue for the local governments, and even, in some cases, selling the power produced to local individuals and businesses.

2. Smaller-Scale Projects. Project size is driven primarily by federal, state, and local tax incentives; the proximity and availability of natural resources; and the ability to transmit power to customers. Given these

constraints, the optimal size for most of these projects is usually relatively small, between 5- and 6-megawatts (at least in the Pacific Northwest). With the existing transportation and distribution infrastructure and the lack of an economically viable long-term energy storage technology, most projects end up either selling their power to utilities under the Public Utility Regulatory Policies Act of 1978 at the avoided cost rates, or at retail rates under net metering. Some developers are also beginning to explore innovative ways to sell their projects' power to the local communities themselves or on the open market.

3. Additional Societal Benefits. Finally, community renewables projects create a wide range of social benefits that transcend the economics of a particular project. These include decreased dependence on foreign natural gas and oil, a power infrastructure that is far less subject to large-scale disruption or terrorism because of its distributed and diverse nature, local control of generation facilities, creation of much needed high-quality jobs in rural areas, and a supplemental revenue stream for agricultural community members that allows them to maintain their rural lifestyle. Additionally, this approach has demonstrated an uncanny ability to bring together people from very different backgrounds -- Republicans and Democrats, urban and rural residents, businesses and environmentalists -- for a common cause.

Utilities and large-scale commercial developers also are beginning to recognize the wisdom of this approach as complementary to their own efforts, because it often helps familiarize local communities with the benefits of renewable projects and ends up making it easier to get their larger projects sited in the future. Some even like the model so much that they are considering building some of these types of projects themselves as a way to replace aging facilities in difficult-to-reach rural areas.

As exciting as all this sounds, the reality is that the distributed community renewables market is still in its nascent stage. To date, most of the projects that have been completed are community wind projects in the Midwest (particularly Minnesota) and small-scale biofuel facilities. Although the model appears to be taking root, spreading to more states and beginning to include other types of renewables, there is still considerable need for education, particularly for potential investors who are not from the energy industry.

One thing is for sure: when done right, investment in community renewables can be highly profitable for investors. This is because they offer:

- Higher risk-adjusted return than virtually any other investment. Under the community renewables model, equity investors with the right tax profile are sought by community developers and are asked to write a check only when most of the risk is out of the project (i.e., the project actually starts producing and selling power). It is not uncommon for investors to receive after-tax returns of 12 to 15% for five to 10 years.
- Sustainable long-term business models. Smaller projects tend to be better able than mega-projects to match capital expenditures to local resources and feedstocks and demand. Smaller-scale projects often have the luxury of using only the highest-quality resources and bearing less risk, because the amount of power they sell is low relative to the total amount used in the surrounding area.
- Increased operational efficiencies. As people who have experience in the renewables industry shift their attention toward smaller-scale projects, they are able to apply their knowledge to squeeze out savings from operations that keeps the variable, and in some cases even the capital, costs to a minimum.

The community renewables projects breaking ground today are just the beginning. As the full value of carbon emissions savings become a tradable commodity, and as new storage and interconnection technologies become available, the distributed community renewables energy model has the opportunity to become an increasingly significant piece of broader efforts moving us toward clean energy and a healthier society.

Ted Bernhard is a corporate and securities lawyer with Stoel Rives LLP in Portland, Oregon, working with companies and developers involved with innovations in the clean energy marketplace. His firm is sponsoring, along with Nth Power and others, a conference called Investing for Clean Energy in the Pacific Northwest on October 4, 2006 in Seattle, which is designed to explore investor-related renewable energy issues with some of the nation's most active and successful clean energy investors.

The information and views expressed in this article are those of the author and not necessarily those of RenewableEnergyAccess.com or the companies that advertise on its Web site and other publications.

FOR FURTHER INFORMATION

[Investing for Clean Energy in the Pacific Northwest conference](#)

[Stoel Rives LLP](#)

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Second Annual Solar Drag Race!

Compiled with information from James White and Robert Lowery

Unlike other solar races you may be familiar with, solar drag racing is different. Solar drag racing uses only sunlight that can be captured by the vehicle over a short 1/4 kilometer distance. The Second Annual Solar Drag Race was held June 24, 2006 and unlike other solar races, no batteries or other pre-charged energy devices are allowed. Racers start from zero and accelerate down a straight track.

All of the racers to-date had less than one horsepower to work with. As the race develops over time, solar dragsters may eventually exceed two horsepower. While one or two horsepower is not much power, it should be enough power to accelerate the racers from zero to more than 50 mph over the 820 foot distance. To achieve those speeds will require efficient solar cells (or thermal engine), lightweight construction, aerodynamics and some type of transmission system between the wheels and motor. Additional performance details can be found in the calculations section listed on the official solar drag race website.

The 1/4-kilometer race was held at the Confluence Technology Center in Wenatchee, WA. It featured competitors in the open, college and high school divisions. The high school and college divisions each received a \$1,000 college scholarship provided by REC-Silicon, the world's largest dedicated producer of solar-grade silicon, located in Moses Lake WA.

Randy Brooks, owner of Brooks Solar, won the unlimited division as the overall winner with a time of 57 seconds. Chehalis High School won the high school division and a Central Washington University student team won the post secondary education class.

James White, from Chelan PUD and champion of the annual race spoke to Willaim Cattin's 'Modern Technology' class at CWU and two students in the class took on the challenge of building a dragster in two weeks. Sean Jackson, engineering technology graduate student and James Protzeller, Gig Harbor, Wash., mechanical engineering technology junior saw this as an opportunity to gain experience that will build their skills on the CWU team that is building a solar car for the 2008 Solar Challenge. "We crossed the finish line going about 12 miles per hour" declared Sean Jackson, from Issaquah, WA who drove the winning car in the post secondary education class.

The CWU entry was constructed of 1-foot by 4-foot lumber, with a steel suspension and powered by nine solar panels, loaned from the Chelan County PUD and Sun Powered Homes of Ellensburg, Wash. Under race rules, Central's three-wheeled vehicle, had to adhere to some strict guidelines. The driver had to weigh at least 170 pounds or weight had to be added to the vehicle.

Photos of last year's 2005 event and details of this year's event can be found on the official website at <http://users.applecapital.net/~jim/solardragrace.htm>.

http://www.greencarcongress.com/2006/06/2006_solar_drag.html

Start planning now for the 2007 Solar Drag Race!

When: Saturday, June 23th, 2007 11:00 a.m. through 2:00 p.m.

Where: Confluence Technology Center, 112 Olds Station Rd Wenatchee, WA

REC Silicon - Official Race Sponsor of the World's Only Solar Drag Race!

The Boehm Home is one of the homes to be featured on Solar Washington's annual solar tour in the Clark/Cowlitz Region. A very popular trend in home building in our state seems to be homeowners buying property with acreage and then planning (over a period of years) for the design and construction of a home that they will live in for many years. (Many say planning for retirement). The Boehm home is an example of this strategy.

Boehm Home: Not Just A House

By Rick Boehm

Home site: 10 acres purchased around 1975. Home site and road logged in 2000.

Planning/construction: 25 years of hoping. Planning in earnest for 5 years. Construction process started 1/04. Broke ground 7/04. Occupancy permit received 9/12/05. Moved into home 9/24/05.

Goals of home: 1) We wanted a home (not just a house) that had character and interest – not just a rectangular box. 2) That it would be low maintenance. 3) That it would be a solar home. 4) That we could live in it for the rest of our lives. 5) That it would be enjoyable to live in the NW with excellent air quality and heating/cooling. 6) That it would be economical to use. 7) That it would be (as much as we could afford) environmentally friendly. 8) That there is a limit on construction costs. 9) That when built, it would model, promote, and educate about better building practices in the NW.

Achievement of goals: House is homeowner-designed with angles and intrigue, but meets most of the requirements of a passive solar home – true south facing, majority of the glazing on south, 3' overhangs on all eaves to avoid summer heat gain but allow winter heat gain, most of the living areas on the southern part of home, transom windows high on interior walls to let southern light into northern rooms, etc. It is constructed with insulated concrete forms (ICF), steel interior framing, manufactured wood roof framing (TGIs, paralam beams), and concrete floors. Solid natural woods are used mainly for accents and for their natural beauty. Fiberglass is used for windows and doors – vinyl is avoided throughout the house. Windows are the most efficient that we could afford (low e^2 , argon, casement/awning). Double sets of entry doors provide an “air-lock” to conditioned space. All passageways are 3' wide (and on one level) to allow handicapped accessibility. Exterior siding is composite cement siding with lifetime paint. The roof is a 50-year standing seam metal roof. The heating/cooling/ventilating systems have multiple levels and ways of usage – natural ventilation, ceiling fan with clerestory window, ground-source geothermal heat pump, heat recovery

ventilator (HRV), masonry wood heater, and propane cast iron stove. Both forced air heating/cooling and hydronic floor heat are provided with the geothermal heat pump. The ductwork also provides conditioned fresh outside air to each room. The domestic hot water is heated in several ways – evacuated-tube solar collector (which has supplied most of our needs in the first year), modified tromb  wall with piping in it to preheat the well water, and the geothermal heat pump. The potable water uses continuous runs of pex piping through the slab via a manifold system. Irrigation water is supplied through water runoff from the roof via a rainwater catchment cistern – this allows us the flexibility to not use the 450’ deep/3 hp well pump. The roof framing has 10” of spray foam insulation in it that also acts as vapor barrier. Almost all light fixtures use fluorescents. One all-refrigerator and a chest freezer are used to provide ample refrigerated storage in a far more energy efficient way. “Solar/wind clothes dryer” will be used. The home meets all of the stringent requirements to be designated an Energy Star home (appliances, lighting, HVAC, insulation R-value, air infiltration, etc.)(and hopefully an Earth Advantage home). A propane generator provides back-up emergency power for essential circuits (well, refrigerator, freezer, etc.). The living environment vision is country Mediterranean utilizing natural products (slate, natural woods, rustic cherry cabinets, brick, etc.) where appropriate. Warm colors were picked to “lighten” the winter months and encourage hospitality. Open concept rooms with pocket doors, vaulted ceilings (throughout most of the home), and a one-level floorplan provide openness and spaciousness that is deceiving to the actual square footage. A detached garage, which visually separates it from the home, has a connecting, wide breezeway that also functions as a covered patio.

Vision yet to be completed: 1) The “front” of the home will be a conservatory (plants, birds, water feature, etc.) that will improve the solar aspects of the tromb  wall and efficiency of the home -- currently in progress of completion.) 2) Photo-voltaics will be used to provide power along with a small wind turbine. Together they will provide energy to allow the house to hopefully become a zero-net energy home – that is, we will produce as much energy in a year as we use.

3) Landscaping will be done over the next few years using organic methods and mainly drip irrigation where needed. 4) Convert most of the remaining acreage to forest lands for managed timber production.

Specifics: 2127 ft² of living space; ≈280 ft² conservatory; ≈1100 ft² garage/heated woodshop/wood shed; 9’ tall outside walls; 22’ height at interior peak of home.

ASES Conference, anniversaries and much more



ASES Annual Conference

As the state chapter of the American Solar Energy Society (ASES) Solar Washington's mission statement was crafted with ASES in mind. ASES' mission is "dedicated solely to promoting solar and renewable energy technologies, and energy efficient building practices". ASES' July 8 to 13 yearly conference in Denver Colorado was the most meaningful I have ever attended as the program consisted of 5 days of information about the dual challenges of global climate change and diminishing oil reserves. Chuck Kutscher demonstrated at the closing luncheon that 9 major renewable energy and energy efficiency technologies could offset enough carbon by 2030 to limit the future temperature rise to 1 degree C. I found presentations by Jim Hansen, NASA's top climate change scientist and National Geographic associate editor Dennis Dimick the most disturbing. Renowned passive solar architect Ed Mazria introduced the architects2030 challenge that all U.S. buildings be carbon neutral in construction and operation by 2030. There were 4 panel presentation about plug in vehicles and Plug In America. The September/October issue of Solar Today has many conference highlights and should not be missed. I have ordered a series of videos and plan to invite you all this winter to attend screenings and action seminars. We are part of the answer to the pressing issues of our time.

Anniversary

My husband Jeremy and I are celebrating our first year with our 6 kW solar electric system. In response to some of the information that we picked up at ASES this year we have added an addendum to our crusade. When you do the math on payback for your solar electric system, consider the cost of charging your vehicle. We figure we get a charge that will take us 30 miles for 64 cents. Beats \$3.00 for gallon of gas that will take you 30 miles. Cost of clean air is of course priceless.

First year of Washington State Incentive Program has concluded (July 1, 2005 to June 30, 2006). Solar Washington is working to get the word out and to help utilities come to grips with the multitude of issues that needed to be resolved when it came to implementation. If you have a solar array that is net metered you should have heard from your utility.

Most asked question that I get after can you really produce solar energy in the cloudy Northwest. Any news on panel manufacturers opening WA state based production plant? The brief answer is that there are lots of folks working on this but it will be a few years before there will be a panel for you to buy. We look to Mike Nelson at WSU's Northwest Solar Center for the latest and we will hear more at his annual Solar Summit in November.

Upcoming Events

Solar Washington invites you to take the American Solar Energy Society's National Tour. Solar powered and energy efficient homes and buildings in Washington will be open for public tours on Saturday October 7, 2006 from 10 a.m. to 4 p.m. Find out how your neighbors are trimming their energy bills and increasing their energy security. Learn about energy efficiency, speak with homeowners and experts and learn how solar technology works, what it costs and why it makes sense. To find a tour near you visit www.solarwashington.org.

Highlights of the tour:

As I finish my column in a hotel room at the first Solar Expo held in Portland, I am buoyed by the activities of Solar Washington's Southwest Chapter. The citizens, solar vendors and utility folks in

Cowlitz and Grant Counties have joined forces to be at what folks here hope to be a yearly event. Lots of interest in the solar tours happening in both Oregon and Washington.

6 years ago at the first Washington State Solar tour there were 4 homes in King County. Following on the heels of 911 we found it difficult to get the word out about the tour. When I explained to a reporter at the Seattle Times that the first net metered home in Seattle would be open for a visit by the public and that net metering was one of the answers to the challenge of energy security she understood and convinced the powers that be at the Times that this story had to be on the front page. We had 200 visitors at that home.

This year we have grown to 22 regions of the state and over 175 sites. Some of the highlights include. Redmond High School on the King County Tour where the Bonneville Environmental Foundation, Puget Sound Energy and Mike Town, scientist teacher at the school (he visited our home the second year of the tour and he has not stopped spreading the word since) joined forces to put up a solar array on the school and build an educational kiosk so that every visitor can learn some of the basics about renewable energy. Bainbridge/Kitsap joins us for the first time thanks to Solar Washington members Tammy and Joe Deets. I think their daughter Hannah is a large part of this couple's inspiration to bring solar to their island home. The amazing home of environmental inspiration for the young, IslandWood is going to be included on the Bainbridge Tour as well as a number of private homes.

Another new tour is happening in Richland. The first net-metered home in Benton County is being championed by Vic Parrish. Chief executive officer of Energy Northwest (the successor to WPPSS) Once and once a supporter of restarting the Fast Flux reactor in Tri-City, Parrish became the first Tri-City leader to take a stand saying that the revival battle was lost, and "Tri-Citians should focus on obtainable goals". www.tri-cityherald.com/news/2002/1215/Story4. Well one of those goals seems to be (I am speculating) the demonstration of the viability of Solar Power in Benton County. Vic and Traci Parrish's 6 kW photovoltaic array is the first net-metered home in the Benton Rural Electric Association's district. The public is invited for a visit on October 7. Please tell a friend about the tour and send them to www.solarwashington.org. for a tour region near them.

The 9th Annual Northwest Solar Summit is happening November 6-8, 2006 at the Wenatchee Coast Hotel and Convention Center. "The Road Ahead: Toward a Norway/Washington PV Alliance".

Conference highlights include:

- USDOE establishes goal of PV at 5-8¢/kWh by 2015! - WA has a roadmap to the goal
- \$600 million Norwegian (REC Solar) investment in WA State PV - a major step on that road
- WA has the nation's first statewide production incentive to help us to 2015 - How is it working?
- Learn how your utility, your community, and you as a community activist, business, or homeowner can help take us there.

Speakers include:

- Denis Hayes, founder of Earth Day, former director of the Solar Energy Research Institute, and director of the Bullitt Foundation
- Tom Starrs, Bonneville Environmental Foundation, Past Chair American Solar Energy Society
- Juron Bye, CEO, REC Silicon (invited)
- Terry Oliver, Director of Distributed Generation Development, BPA
- Steve Johnson, Director, Washington PUD Association

Go to www.Northwestsolarcenter.org for more information and to register today.

Be sure to keep an eye on our webpage as we add renewable energy events on an ongoing basis.

Taking Action

The hard working folks at the Energy Security Initiative office are looking for support in getting the word out about the importance of voting yes on 937. www.washingtonforcleanenergy.org

Do you have ideas for topics and potential speakers you would like to see us cover at upcoming meetings? Do you have a renewable energy topic or expertise to share? Would you like to get more involved in a premier Renewable Energy Association? Give me a call or e-mail. Pamela Burton at 206-706-1931 Burton@nwlink.com ☀

This year's solar tour will feature sites with alternatively fueled vehicles including Dr Dan's biodiesel station in Ballard. Lyle Rudensey, M.Ed., aka "BioLyle" consults, and gives classes, workshops, and school assemblies about biodiesel. He and his life-partner Bob Allen will be showing their PV, solar hot water heater, and biodiesel systems as part of the Solar Tour.

Biodiesel: A Solar Fuel!

By Lyle Rudensey, M.Ed.

When most people hear about solar power, they think about solar panels made of silicon and glass, stretched out on our rooftops absorbing those solar rays. But, what about nature's solar panels, the leaves of plants that are converting that solar energy via photosynthesis into starch, cellulose, and plant oil? Did you know that Rudolf Diesel demonstrated his first diesel engine operating on pure peanut oil at the World Exposition in Paris over a hundred years ago? (1900). Indeed, Diesel thought of vegetable oil as a fuel that American farmers could "grow" that would allow the US to create its own fuel rather than be dependent on foreign oil supplies. What a novel idea! It's only taken us a hundred years to get back to this line of thought with the recent popularization of the fuel for diesel engines made from vegetable oil: Biodiesel.

What is Biodiesel?

Technically biodiesel is the common name for chemicals known as fatty acid methyl esters (FAME) which can be made from any fat- animal or vegetable! Fats and plant oils are triglycerides, meaning that in each triglyceride molecule, there are three fatty acid chains attached to a glycerin backbone. Biodiesel is made by mixing the fat or veggie oil with an alcohol and a catalyst, which breaks off the heavy part, the glycerin, which settles out as a waste product. At the same time, a carbon group from the alcohol pops onto the end of each fatty acid chain, forming biodiesel molecules (FAME). Functionally then, biodiesel is essentially a thinner (ie less viscous) form of veggie oil that is similar in viscosity to diesel fuel and will work in any diesel engine. Another way to make the oil thinner is to heat it up, and that's just what some people do who have what are called "SVO" (straight vegetable oil) kits installed in their cars. But this requires a separate tank to heat up the oil and a kit that allows you to switch from your start-up fuel (diesel or biodiesel) to the SVO once it's hot (then you have to switch back before you stop, or the cold SVO will not allow your engine to start later). One of the great things about biodiesel is that there is no conversion required- it can go directly into the fuel tank, just like diesel fuel, as long as your vehicle has a diesel engine. It can also be mixed with petrodiesel in any percentage, so when you are on a long trip, and there is no biodiesel stations around, you can just fill 'er up with diesel (unless you are a real purest and you just can not stand the thought of any petroleum product going in your car, and you just have to bring gobs of biodiesel along or map out your route to follow the biodiesel stations).

Why use biodiesel?

Sociopolitical- “No War Required”

I confess that I started using biodiesel right around the time of the US invasion of Iraq. I was so angry that it seemed like we were going to war for oil. I saw biodiesel as something I could do that would unplug me (at least in good part) from the petroleum system. Dr. Dan of Dr. Dan’s Alternative Fuelwerks, who has been selling biodiesel in Seattle for several years, has told me that many of his customers have told him they use biodiesel for similar reasons.

Global warming reduction

Then there is the global warming issue. Because those leafy solar panels are pulling their carbon out of the air (instead of from stored underground petroleum), biodiesel combustion contributes 78% less carbon to the atmosphere (over its life cycle) than petrodiesel. Biodiesel also produces over 3 times as much energy as the amount that is required to produce it. Compare that to petrodiesel which requires slightly more energy to produce it, and hydrogen which requires about 3 times as much energy to produce as you get out of it. Some of these figures are controversial, but the majority of reputable studies show that biodiesel is definitely energy positive. Much of this depends on the type of crop the oil is being made from, and it’s growing conditions, and a lot of other factors. If you make it from waste restaurant oil the figure is really going to be energy positive!

Pollution reduction

A couple of years ago I learned that kids riding school buses may be breathing significant amounts of toxic diesel exhaust- anywhere from 4 – 70 times the amount in the air outside the bus. Scientists have shown that there are 15 chemicals in diesel exhaust that are known carcinogens! Diesel is a dirty fuel, containing as much as 30% benzene and polycyclic aromatic hydrocarbons, the burning of which produces those carcinogens. Biodiesel by comparison is quite a pure fuel, containing none of those nasty chemicals, Less toxic than table salt! Biodiesel also contains about 11% oxygen by weight, and thus burns more completely and produces less carbon monoxide and particulates (which essentially deliver the carcinogens stuck to them deep into your lungs!), and other partial combustion products. Biodiesel is the only alternative fuel that has passed the EPA’s strict Tier 1 and Tier II health effects testing required by the Clean Air Act of 1990. So we really need to be trying to get school buses, trucks, ships and other dirty diesel burners to start using biodiesel! To this end, I helped found the Breathable Bus Coalition, which is working with school districts to help them transition to biodiesel. Many school districts have already made the switch and report happier children, drivers, and mechanics and cleaner buses. The Seattle School district is about to jump into the fray, joining King County Metro, and the cities of Seattle, Lacey, Port Townsend, and many others already using biodiesel in their diesel vehicles.

Safety

Another advantage of biodiesel is that not only is it non-toxic, but in it’s liquid form it is almost not flammable! The fuel has to be heated up to over 300 degrees F before it will combust. The only reason it works in the diesel engine is because diesels compress the

vaporized fuel and air mixture so much that it combusts (without the need for spark plugs). Thus, if a biodiesel powered car, truck or boat is in an accident, the resulting spill won't require a hazmat team to clean up, and will very likely not result in a fire.

Equipment benefits

Biodiesel has much more lubricity than diesel fuel, and thus allows the engine to wear less and last longer. Because of its solvent and lubricating properties, mechanics have reported that engines running biodiesel look like new! The lubricating properties of biodiesel may play an important role. When diesel fuel has its sulfur removed (scheduled for this summer and fall- see below), the diesel fuel becomes very dry and that lubricity must be restored with an additive (like biodiesel!).

Why it's taken so long:

One of the reasons diesels have a bad reputation is because people see them as smelly smoky vehicles that are very polluting. That has been the case until recently. We now have much cleaner-burning turbodiesel engines in modern Volkswagens and Mercedes and other vehicles. But even those old smoky diesels can be cleaned up significantly simply by adding even a small percentage of biodiesel. I have spoken to people who use B99 (meaning 99% biodiesel) in their old Mercedes who report that their cars have gone through emissions tests showing ZERO emissions! OK, this actually does not mean that their cars are not producing any emissions- it is just that the instruments used for emissions testing are not calibrated low enough to detect the much lower pollution levels emitted by vehicles using pure biodiesel! The emissions folks usually are puzzled and check their instruments, until they are told that the car uses biodiesel.

The other problem is that until this summer, the diesel sold in this country has had a relatively high amount of sulfur in it (300 – 500 parts per million or ppm). The reason this is a problem is because the sulfur kills the catalyst that is used in the catalytic converters installed on cars sold in Europe for years, where they have had ultra-low sulfur diesel (only about 15 ppm). So that has been the catch-22- people did not want diesels (eg California does not allow the sale of new ones) because they are more polluting, but the reason they are so polluting is because the available fuel is “dirty” with high sulfur content that poisons the catalyst and has not allowed car manufacturers to put catalytic converters on diesels in this country. This is all about to change, because the EPA has mandated that all on-road diesel fuel contain no more than 15 ppm (making it ULSD or ultra-low sulfur diesel) starting this summer and fall. So hopefully, more diesel models will become available in the U.S. soon. Biodiesel, by the way, is an ULSD, containing less than 15 ppm sulfur, so it will work fine with the new vehicles.

Precautions

There are a couple things to be aware of when starting to use biodiesel. Biodiesel is a good solvent and will clean out the soot and other gunk left in your engine and lines by regular diesel fuel. This junk will eventually clog up your vehicle's fuel filter. So it is routinely suggested that you change the fuel filter of your vehicle after running a couple of tankfuls of biodiesel. Also, biodiesel tends to degrade rubber. This usually isn't a problem in newer vehicles because they use synthetics instead of rubber, but in pre-1993

vehicles, some of the hoses and seals may be made out of rubber, and should be watched for signs of swelling or degrading. If so, they can be replaced with the synthetic lines, made out of a material called Viton. The final thing to be aware of is that biodiesel will begin to cloud up and gel (crystallize) at higher temperatures than petrodiesel. It depends on the type of oil the biodiesel was made from, but most commercial biodiesel is made from soybean oil, and begins to crystallize and cloud up at around freezing (32 deg F). If you are driving your vehicle every day, the fuel should stay warm enough that it won't gel up even if temps are a little below freezing. But when we get a "hard freeze" with temps in the 20's for several days, then you should add some petrodiesel to your tank. The colder it is, the higher the percentage of petrodiesel you will need to add to keep your fuel from gelling. It might be a good idea to keep a clear plastic container of your biodiesel on the front seat of your car, so you can see if it is starting to gel. If so, it is time to let go of your purist ethics a little and add some petrodiesel. Unfortunately, the anti-gel additives made for diesel do not really work for B100; they only work well for mixtures containing petrodiesel. (One additive known as Arctic Express is supposed to reduce the gel point of B100 by a few degrees). Of course if you are only using B50 or B20, this won't even be an issue in the northwest, given our relatively mild climate.

Washington biodiesel

Biodiesel is emerging from its infancy, and there are now a couple of companies manufacturing it in WA state, with several more coming online soon. The volume of biodiesel produced in the US tripled from 2004 – 2005 (25 to 75 million gallons per year (mgy), and is expected to at least double again this year. Most companies use virgin soybean oil imported from the mid-West, but some use waste restaurant oil that would ordinarily be made into animal feed or cosmetics. Manufacturers in WA state are also working with farmers in Eastern WA to see if oil from a variety of crops can be produced in an economically feasible way. Some of these crops, which are already grown for other products, include rapeseed, canola, mustard seed, sunflower, safflower, crambe, and soy. Many of these plants, particularly rape and mustard, produce a higher quality biodiesel than is now produced from soybeans (higher cetane value, lower gel points). Much depends on finding markets for the "crush"- the remains after the oil is squeezed out. Mustard seed pulp has been made into an excellent natural pesticide, and rapeseed plants have traditionally been plowed into the ground to enrich the soil for growing wheat. Political incentives will hopefully help to get things going. A bevy of biodiesel incentive bills was passed in 2003. Last year a bill was passed that would require 2% of the volume of diesel fuel produced in WA state to be biodiesel, to go up to 5% when it is shown that in-state production can rise to that level. The governor also signed a sizable loan package to create incentives for WA state farmers to produce oil (including crucial crushing facilities) for conversion to biodiesel.

Local availability

More and more biodiesel stations (or gas stations that also sell biodiesel) are cropping up around WA state and the US. A list of these sources can be found at the following page of the website of the National Biodiesel Board:

<http://www.nbb.org/buyingbiodiesel/retailfuelingsites/> This list is quite up-to-date!

Homebrewing

If you're a do-it-yourselfer like me, you can make your own fuel from waste restaurant oil for about 70 cents per gallon! I've been making all my own fuel for my '02 Jetta TDI Wagon for over three years! There is a lot of information available on the internet- my favorite sites include <http://biodieselcommunity.org> and <http://utahbiodieselsupply.com> It is really fun to make your own fuel! And very satisfying to just go to your garage to fill up. There are some safety issues to keep in mind, since you will be handling chemicals such as methanol and lye. But these materials can be handled safely and responsibly. I encourage anyone interested to thoroughly research their methods before starting. Many restaurants, especially small privately owned ones, will be glad to give you their own (as long as you are dependable), because it will save them the \$40 or so per month that they pay the rendering company to take away their oil.

Finally...

It is way past time that we face the global warming issue, and growing pollution and begin to put much more of our resources into renewable forms of energy such as solar and biodiesel. Right now there is not enough waste restaurant oil or crop land available to meet our diesel fuel needs. But other technologies show promise, eg some species of algae are composed of half their weight in oil, and a major study by the National Renewable Energy Lab and others have shown that if we cultivated such algae in large algae ponds using sewage waste and/or smokestack emissions to feed them, that we could potentially produce enough biodiesel to meet the entire diesel fuel need of the US!

Although conservation and riding your bike are still preferable, if you are going to drive, and if our country is going to continue to use trucks, buses, ships, trains, and tractors- pretty likely! – then it is time we started to add some biodiesel to the mix. These vehicles could begin using biodiesel TODAY and reap immediate benefits in terms of reduced pollution, health, and a contribution to the sustainability of our planet.

Lyle Rudensey, M.Ed., aka "BioLyle" consults, and gives classes, workshops, and school assemblies about biodiesel and provides more information on his website <http://biolyle.com>, email biolyle@gmail.com.

He is an active member of the NW Biodiesel Network, <http://nwbiodiesel.org>, and is also co-founder of the Breathable Bus Coalition, <http://breathablebus.org> which provides advice and assistance to individuals and school districts working toward the use of biodiesel in school buses. He and his life-partner Bob Allen will be showing their PV, solar hot water heater, and biodiesel systems as part of the Solar Home tour on October 7.

John Watts has represented the third ward on the Bellingham City Council since 1999. His main topic of interest—as growth occurs—is determining how to preserve our quality of life, including the natural environment. The Watts/Casey Home is one of the homes to be featured on Solar Washington’s annual solar tour October 7, 2006 in the Bellingham Region.

Solar Power Case Study: An Old Idea With New Economics

by John Watts

In late 2005, I attended a conference and exhibition at the Bellingham Ferry Terminal sponsored by Sustainable Connections and the Building Industry Association. One of the sessions focused on solar energy systems for homeowners as a means of saving on electric power costs and protecting the environment. A presentation by Dana Brandt, a local expert on renewable energy, particularly attracted my attention. Later, I contacted him for advice on the feasibility of installing a small photovoltaic (PV) solar power generating system at my home.

Dana surveyed my home for potential sites that capture sunlight most of the day, and confirmed that my garage roof was a really good choice. The garage faces south and has a flat roof that gently slopes to the north, giving it a relatively unimpeded solar exposure during most of the day. This site also has the advantage of not significantly impacting views from any direction—an important consideration in maintaining good relationships with neighbors. Dana used a special instrument that allowed him to determine the maximum percentage of potentially available direct sunlight that could access a properly placed and angled array of solar panels, during all seasons of the year.

Costs and Feasibility

Based on this survey and the schematic he developed, Dana estimated the costs associated with a roof-mounted PV system with 1.52 kW generating capacity, assuming that all the generated direct current (DC) power would be converted to alternating current (AC) power and fed back into the Puget Sound Energy (PSE) grid through my electric meter. The system included eight Sanyo PV Panels—each three feet by four feet, four inches—mounted side by side on adjustable aluminum frames, an assembly designed to withstand 200 mph winds. The total solar array surface area is 104 square feet and its length is 24 feet. The system uses a power inverter to convert direct current DC power from the PV array to AC power, and a separate output meter to track both the total energy generated and instantaneous readouts. The entire system is hard-wired through my household electrical circuit breaker panel into my electric meter, a special type provided free by PSE that is designed to track their net metering system. (See article “The Time Is Right for Solar” by Dana Brandt on facing page.)

Based on my specific system design, Dana’s proposal (December 2005) for the total installed cost of my PV system was \$13,685 excluding any incentives. Using conservative estimating techniques to calculate payback, these were the results:

Taking into account the added resale value of my home, the PV system will payback in about 16 years. If I choose to ignore the increased value of the home as part of the payback, the payback becomes 25 years. The estimated life of the PV system itself is 30 years. Substantial increases in the cost of power will shorten this payback period.

The payback calculations included the following incentives, tax credits and energy saving calculations that helped me to justify making this investment:

One-Time Incentives:

- Federal Income Tax Credit for Renewable Energy: \$2,000
- PSE Rebate (based on 1.52kW installed capacity): \$874
- Washington state sales taxes are also waived as an additional incentive.

Ongoing Incentives:

- PSE Net Metering (increases in proportion to rates):

\$0.067807 per kWh

- Washington State Production Incentive (nine years total):

\$0.150 per kWh

- Green Tags Certification Credits: \$0.050 per kWh

For my historic rate of electrical usage, the PV system is expected to generate about 22 percent of my annual consumption, or about 1,642 kWh per year. At peak production, about 33 percent of my average needs will be produced. When I am not consuming power at the usual rate, my PV generated power sold to PSE may exceed the amount I buy from them.

Projected Annual Savings From Ongoing Incentives

- PSE Net Metering:

1642 kWh/year X \$0.067807/kWh = \$111.34 per year

- Washington State Incentive:

1642 kWh/year X \$0.15/kWh = \$246.30 per year

- Green Tags Credits: 1642 kWh/year X \$0.05/kWh = \$82 per year

- Total Estimated Savings From Ongoing Incentives (at current rates) = \$439.64 per year

Because PSE charges more for power usage above 600 kWh per month, I will also almost always avoid having to pay for this more expensive power (\$0.08484 per kWh). This amounts to "peak shaving," which in this case saves me from having to use power that is 25 percent more expensive.

Most single-family homes use electric power at levels averaging between 15 kWh/day and 50 kWh/day, depending upon the number of people, appliances, lights and the intensity of use. My electric power use has averaged just over 20 kWh/day during the past two years (7,347 kWh/year).

Installation and Commissioning

Based on the estimated economics, I decided to go ahead with the project and wrote Dana a check to procure the equipment and materials. These were delivered directly to my home and stored in the garage until the weather improved enough to begin installation. This relatively simple installation required three days, with most of the work done by Dana, with help from an experienced and licensed electrician he hired for one day. After completion, the PV system was tested, turned on and began to immediately generate power. Inspections by the city and PSE proved routine, and I first entered the power generation business during a sunny break!

Each step of this installation was recorded by digital camera, and the supporting paperwork and documentation was handled quickly. I was pleased to pay Dana the balance due and ask for his assistance in writing up the project for publication. Four PSE personnel came for a final inspection and short tour of the system with Dana. Look for this PV installation to be a stop on the 2006 Sustainable Connections tour.

Pollution Avoidance: A Hidden Benefit

Another great benefit from using PV solar power is avoiding greenhouse gas emissions and other pollutants from conventional power plants that burn fossil fuels. Dana estimates that a 1.52 KW PV system like mine typically saves the following pollution from occurring:

- Carbon Dioxide [CO₂]: 465.90 lbs/year or 13,977.0 lbs over 30 years
- Nitrogen Oxides [NO_x]: 0.90 lbs/year or 27.03 lbs/30 years
- Sulfur Dioxide [SO₂]: 2.56 lb/year or 76.75 lbs/30 years
- Mercury [Hg]: 3.96 mg/year or 118.8 mg/30 years

The actual pollution avoidance benefits we realize here in the Northwest are higher than these standard estimates because 80 percent of our energy normally comes from hydropower, which doesn't require burning fossil fuels. Therefore, only about 20 percent of these amounts derive from local power generation. But, because Bonneville Power doesn't scale back its hydropower generating ability, this avoids having to import energy produced from fossil fuels elsewhere, which means the actual pollution avoidance we experience in Washington is about 3.75 times the above the standard calculations above.

Conclusion: The New Energy Economics

The pollution avoidance realities outlined above have always been in existence, but were obscured by the benefits of low energy costs and an almost tacit acceptance of incremental environmental degradation. How easy it has been to ignore these impacts— almost like a frog in a pot of water, slowly being brought to a boil. Now that energy costs are rising rapidly, global warming is visibly happening and the economic gap between personal/family incomes and necessities is growing, we are suddenly able to see more clearly the impacts of continuing a 'business as usual' attitude toward how we live and use energy.

These national and global trends have directly led to some new economic realities that are now beginning to make sustainable practices more feasible and attractive. When an investment in a small PV energy system begins to pencil out, people will begin to notice, and some will be inclined to make similar investments. For example, the trend toward

energy efficient appliances and vehicles is becoming more and more of a 'no-brainer.' Even with slightly higher first costs, these high efficiency machines and systems easily pay for themselves very quickly in reduced energy costs. More important, they continue to pay large dividends in avoided energy and pollution costs. Hopefully, these new economics will translate into more sustainable lifestyles as the preferred choice of many, not just a few.

Coupled with the new economics, more new high-tech and high efficiency devices are being developed to help curtail energy waste, but these are not—in themselves—the answer. There are no good substitutes for personal awareness, accepting responsibility and taking action. Consumption has its own limits, and its expensive consequences.

As Dana Brandt suggests, a great new 'take-away' message to offer is: "All you who care for the environment, and/or wish to be less dependent on foreign oil, the time has come that you can afford to do something about it. The confluence of an array of incentives and high energy prices makes solar power—and other highly energy efficient systems—accessible to nearly all of us."

Footnote:

Two neighbors noticed the PV System installation and inquired what was happening. Both have subsequently asked Dana for proposals! Are there any others out there?

Do We Want a Message Board?

By **George Meyer**, Solar Washington webmaster



☀️ What a difference a click can make! As I'm writing this, I have at least a full day of work piled up to get the updates online for the tour. So I figured this column would be really short because all I can think about is the tour and getting it online ASAP. But then I clicked on our Message Board... It appears that our MB has been swamped by spammers. Early on I had upgraded the security to require registration before someone could post anything. But out of 525+ current registered users, only about 25 are legit. Of 50+ postings, only 32 were legit. -I'm sure the spammers are doing this automatically with no effort or care on their part. Yesterday I spent some time getting rid of the garbage postings and am no longer inclined to bother with the bogus registrations. Only 6 months ago, in our Spring '06 newsletter, we were glad to announce our new MB. Josey & I encouraged input about an initiative. Yet Josey and I were the only ones who posted anything on the topic. More than five months went by before there was a single posting by anyone else. Due to this surprising lack of (legitimate) use, I have to wonder if it is worth having the MB. Our Tacoma friends already gave up on a MB for the very same reasons.

The choice we have to make is to either close the MB or upgrade our security level some more by requiring folks to get & use a password just so they can log in before posting. But I wonder about the interest level to make it worth doing. If you have an opinion about this – either way, please send an email to keepthemb@solarwashington.org and put your vote in the subject line (yes to keep or no to close). If you want to, you can add your reasons in the body of the email. I will let the SW board know what the results are and we'll move forward from there. I will also report on this in my next column.

☀️ We need a newsletter editor! Yeah, I know you've heard that before... Will Thomas graciously took the job. But after just one issue he had to resign due to medical problems. We wish him well. Since we do not have a newsletter editor, Pam & I are working to put this together. Who ever takes the job will find a bunch of help. If you are interested, please contact Pam or me at the links below.

☀️ Ahhh the Solar Tour...

Our tour continues to expand. A couple of weeks ago, I counted over 150 sites online and still have a pile to go through. The variety looks fascinating with Bio-diesel, green building ideas, as well as more traditional solar via PV, DHW, as well as passive. Thanks to everyone who volunteered to have their place on our tour this year and thanks to the docents!

If you would like to send an article, link, event, suggestion, or just a comment about **the website**, please send to gmeyer@solarwashington.org.

If you would like to send an article for or comment about **the newsletter**, please send to newsletter@solarwashington.org. ☀️

**DR. IRIS OVSHINSKY, ECD OVONICS CO-FOUNDER, VICE PRESIDENT AND
DIRECTOR, DIES IN BLOOMFIELD HILLS, MICHIGAN**

Rochester Hills, Mich., August 17, 2006 — It is with deep sorrow that Energy Conversion Devices, Inc. (ECD Ovonics) (NASDAQ:ENER) announces the death of Dr. Iris M. Ovshinsky, co-founder, vice president and a director of the company. Dr. Ovshinsky died August 16, 2006, at her home in Bloomfield Hills, Michigan, at the age of 79.

Iris Ovshinsky and Stan Ovshinsky, her husband and fellow scientist, founded ECD Ovonics in 1960 to research and use new science and technology to solve serious societal problems. Since the company's founding, Iris was a true pioneer and played a leading role with Stan in all areas based on his inventions in amorphous and disordered materials. Under their leadership, ECD Ovonics has developed into a multi-disciplinary business, scientific, technical and manufacturing organization in the fields of alternative energy generation, energy storage and information technologies.

"We are greatly saddened by Iris' death. She was a woman of great vision and an amazing human being," said Robert C. Stempel, Chairman and CEO of ECD Ovonics. "She built a corporate culture which helped us grow as a company. All of us in the ECD Ovonics community will greatly miss her and join me in extending our deepest condolences to Stan and her family."

Speaking for the family, Dr. Ovshinsky's daughter, Dr. Robin Dibner, said, "Iris fought for peace, equality and justice with empathy for everyone. She found great happiness in creating new industries that resulted in high-value jobs. She was full of life and sparkle, bringing joy to all who met her."

Iris graduated with a B.A. in Zoology from Swarthmore College, received an M.S. in Biology from the University of Michigan, and a Ph.D. in Biochemistry from Boston University. She is a member of Sigma Xi, an associate member of Michigan Center for Theoretical Physics of The University of Michigan, and a member of the Editorial Board. In 2000, Iris was named "Hero of Chemistry" by the American Chemical society along with Stan as "chemical innovators whose industrial work in chemistry or chemical engineering has made significant and lasting contributions to global human welfare." In 2003, Iris was inducted into the "Academy of Distinguished Alumni" of her alma mater, Boston University. Recently, she and Stan were profiled in the documentary *Who Killed the Electric Car?*

Dr. Ovshinsky is survived by her husband, Stan Ovshinsky; their five children, Robin and Steven Dibner, Harvey, Dale and Ben Ovshinsky; and four grandchildren, Natasha and Noah Ovshinsky, Sylvie Polsky and Pablo Dibner.

In lieu of flowers, donations may be directed to The American Civil Liberties Union – Michigan Chapter, the Physicians for a National Health Program (29 E. Madison, Suite 602, Chicago, IL 60602), or The Workmen's Circle/Arbeter Ring (26341 Coolidge Hwy., Oak Park, MI 48237).

Funeral services will be arranged by The Dorman Chapel (248-406-6000) located at 30440 12 Mile Road, Farmington Hills, MI 48334 (1-1/2 blocks east of Orchard Lake Road on the north side of the street). Visitation for family and friends will be on August 20 from 3:00 pm to 6:00 pm. Interment will be private and will take place on Monday, August 21, in Akron, Ohio. A memorial tribute will be held at a later date.

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