

SUMMER 2015

THE MAINE SUN

NEWSLETTER of the Maine Solar Energy Association



HOPE Festival 2015 Earth Day Gathering

By John Burke

MESEA, DADS, and SEADS, again shared the booth at the 22nd annual HOPE festival on the 25th of April with the Peace and Justice Center of Eastern Maine at the Student Rec. Center, UM in Orono. A decent crowd braved the weather this year and enjoyed the music and glorious alternatives to War !

The 'table' was staffed with a MESEA Bd. member, and a printed Maine Sun ready to share with the folks interested ... and that was not overlooked ! The SEADS Community Land Trust effort, reborn with a fresh brochure, to entice those with dreams of 'Going Back to the Land', with the 'greater community' of renewable energy enthusiasts, and organic gardeners, working for 'Real World Peace' ! DADS (dadsolar.com), fresh with an IRS 501(c)(3) status, shared their focus of creating a Solar Powered Educational Center with connections to SEADS and MESEA.

These Washington County organizations, aimed at low-tech, do-it-yourself, solar education, are still interested in your future as a solar community power project partner ! Yes, you and your family and friends may be looking for a connection for a peaceful world and a future we can live with, and pass on to our grand-children.

For information about SEADS Community Land Trust on 60 acres, by the Harrington River, in rural Columbia Maine; Or a full-time, part-time time-share endeavor, with a solar educational community; Or to become a member of MESEA, the only Maine State Chapter of the American Solar Energy Society (ASES). Please call John at (207) 546-1639 ... We accept all calls !



The MESEA Table at the HOPE Festival

Our Website: www.mainesolar.org

Solar Work in Indonesia 2015

By Richard Komp

After she watched the **Burning in the Sun** movie on PBS, Barbara got hold of me and asked if it was possible for me to go with her to Indonesia to do the same kind of solar work there bringing power to the people. Of course I said yes and we steered a series of meetings. Barbara was part Indonesian and had worked there so she had a lot of contacts in the country. One of them, a part of the new governmental administration, was excited about the possibilities and agreed to plan the solar course I was to teach.

After we had already bought the plane tickets from Los Angeles to the capital, Jakarta, He informed us that he was doing off to work in Europe and left our plans in confusion. Barbara found another Indonesian group to work with us, a rich family with holdings in Sumatra; so I flew off at the end of April to start the work. The family has six siblings and one of the brothers had a non-profit organization that runs a school for poor children where I am teaching the junior and senior high school age children+. His sister owns a resort hotel right on the Indian Ocean beach nearby and Rudy (my guide and translator) were put up in the hotel. I got to aim in the bath water warm ocean water in the mornings before school. *Continued on Page 4*



Rudy teaching the stuents how to soder PV cells

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The Maine Sun

Newsletter of the Maine Solar Energy Association

The Maine Sun is published four times a year by the Maine Solar Energy Association (MeSEA), a non-profit organization (sister chapter to the North East Sustainable Energy Association).

Our Mission:

We are dedicated to promoting the public awareness and use of:

- solar energy
- energy conservation
- other renewable non-polluting energy sources
- environmental and health awareness building practices throughout the state of Maine

Opinions expressed by authors or editors do not necessarily reflect the views of MeSEA. The publisher reserves the right to refuse advertising which is not consistent with the goals of this organization. Acceptance of advertising does not constitute endorsement of the advertiser, its products or services.

The Maine Sun welcomes articles, submissions, photographs, and letters. Please send editorial materials to the following

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Calendar of Events

MESEA Website WWW.mainesolar.org
Facebook: Maine Solar Energy Association

MESEA PV/Thermal Hybrid Workshop Jonesport, Maine 15 – 16 August

This is a follow-up workshop of the PV/Thermal workshop held in our headquarters in Jonesport last August. At that workshop we built a new style PV/hot water Hybrid module but never had time to install the single module we built. *(See the article on the next page and our Fall 2014 Maine Sun).*

We will build a second hybrid from a 250 watt PV module, then install both modules on the lower roof of the building, running pipes to a storage tank in the attic over the bathroom. This will be a thermosiphon system with no pump needed to circulate the water-antifreeze liquid through the heat exchanger built onto the side of the tank. The workshop will include lectures on solar thermal systems, then go over details of the plumbing and electrical connections between the Hybrid system and the building as well as information on other types of PV/Thermal Hybrids.

Dates: Friday 14 August – Free evening seminar

Saturday and Sunday 15-16 August 9am to 5 pm – Hands-on workshop

Cost: \$160 for the weekend, including meals – \$80 for one day, with lunch.

For information or to enroll: 207-450-1141, sunwatt@juno.com



**Renewable Energy Workshop, Community Energy Partners
GPCOG - Portland Maine, 10 July 8:30 am – Noon FREE**

**The Greater Portland Council of Governments (GPCOG) and
Community Energy Partners (CEP) are holding a free
workshop on maximizing opportunities in renewable energy
development for farmers and agricultural related businesses.**



For more information and registration online: www.ases.org

MESEA is a chapter of ASES and we will be at the conference at Penn State. We will take part in the Chapter Caucus on the 27th, Richard Komp will be giving a scientific paper and John Burke will be giving a hands-on PV solar cell phone charger workshop last day of the conference.



More PV/Thermal Hybrid Work

By Richard Komp

I had an opportunity to work in California on a large project that uses the new design of photovoltaic/thermal hybrid modules we developed last August (*See the Fall 2014 Maine Sun for details of that project*).

On the way back from Indonesia I took a short detour to San Francisco from Los Angeles on Amtrak's Coast Starlight. This train takes its time along the Pacific coast, probably one of the most scenic train trips around. You go right along the beaches and north of Santa Barbara I go to see the army of orange and yellow clad people desperately trying to contain the oil pipeline spill, and to clean up the sand where the containment didn't work (The price we pay for cheap, convenient fossil fuels).

When the train finally got to Oakland (After a trip several hours slower than the same train used to travel behind a steam engine in the 1930s); I took the Amtrak bus to downtown San Francisco to be met by Bryan Foster. I had met Bryan and stayed with him during the InterSolar Conference last July that was the Annual meeting of the American Solar Energy Society.. At that time we talked about using the Hybrid PV/Thermal concept on one of the apartment complexes owned by him and his mother.

This 9 story apartment complex is narrow and climbs the side of a hill that is steep, even by San Francisco standards. The roof already has a set of 100 – 125 watt PV modules that makes most of the electricity the tenants use, but Bryan wants to convert them to the new design hybrids to furnish their hot water as well.



Part of the PV array on the roof of the apartments.

We removed one of the modules and took it down to the workshop to modify it into a Hybrid.. Bryan had already bought sheet aluminum and 1/4" diameter aluminum tubing for the conversion. He also had a nice tubing bender and some Indies of his own of how to put the aluminum heat exchanger on the back of the PV module.

This is a somewhat different system than we used last August in that all the parts are aluminum and the aluminum sheet is thicker than the thin material we used then. Since the sheet was too stiff to bend around the small diameter tubing, we glued the flat sheets right onto the Tedlar backsheet of the module, using ordinary 100% silicone caulk which I had discovered decades ago, is a good conductor of heat while being a good electrical insulator..

We then bent two of the tubes into complex U shapes to make two water channels to carry off the heat from the aluminum sheet.



Gluing the tubing to the aluminum heat exchanger.

We took strips of the aluminum and bent U-channels in them to hold down the tubing and get good heat exchange area between the tubing and the aluminum sheet. There are four tube ends coming down from the corners of the module; two of them will be the water inlets at the low end of the tilted module and the other two will be the hot water exits at the high end

Bryan has a small 12 volt dc pump to try out this one module and it works properly he plans to convert the rest of the modules on the roof, one row at a time, to get a very large PV/Thermal Hybrid system. I will continue to work with him and follow the progress of this interesting project..

While I was in San Francisco I also did some other things. We went to a meeting of an environmental group which is working politically to get the remaining nuclear power plants sitting on the fault lines in California closed down; and I also was interviewed for a half hour in a Mission St. café for a cable TV show. I got to stay in one of the tall Victorian homes on a steeply sloping street.



From Page 1. Although the family is Christian, most of my students are Muslim and one of the teachers is Buddhist, but everybody seems to get together well, a welcome change in the world. I got invited to give a seminar at the Buddhist Temple school and they want me to work with them as well. After the introductory lectures on the sun and how solar cells work, we started by building the small solar cell phone chargers that are so popular with young people. (I think every girl in the class wants to take a *selfie* with me on her phone). The solar charger will recharge any phone except the Apple iPhone, but that was not a problem since nobody I work with in the 3rd World can afford the luxury of an Apple product.



The Indian Ocean beach from the top floor of the hotel

I taught the students how to cut PV cells with the little diamond cutting wheels, and also taught them how to calculate how many PV cells of what size are needed for a particular application; so after the students had built a couple of the cell phone chargers, we bought a small LED lantern. It only cost \$4.50 at the local market and could be recharged from the local 220 volt power line. We opened up the lamp and found out the battery voltage, then built a small PV module to recharge the lamp from the sun. This would make a good little light for the small grass hut so many of the rural people in Indonesia live in. We also covered the design and installation of solar powered water pumps but haven't built any of those yet. We also went into the design and installation of PV systems for homes, in anticipation of my next visit when we will be doing such an installation. I would usually have about an hour of instructions before we started the two hours of hands-on work.

Building a Solar Oven

However, we also have started building the bigger 32 watt PV modules for 12 volt home systems. These cannot use the simple silicone caulk (The stuff that smells like vinegar) as the encapsulant to hold the PV cell strings in the cheap picture frames we use for the small modules. So the next step was to teach the students how to build solar ovens, needed to heat cure the ethylene-vinyl-acetate (EVA) plastic everybody uses in making the large commercial PV modules. I have

developed a way of using large solar ovens to do this curing instead of using the half-million dollar laminating machines the commercial producers use (*see the Winter 2011 Maine Sun for details of how this is done*). I had brought several square meters of the EVA with me to Indonesia but it hasn't been used yet.

After I gave the lecture on solar thermal systems and went into the design and construction of solar cookers in great detail, Alex the Buddhist teacher whose family owns a hardware business, took it on himself to gather the materials and take charge of the actual building of the solar oven. The solar oven is now finished and working.



Starting the assembly of the solar oven

One Sunday they took me to a remote village that now has a central PV power system. It is producing the usual 220 volt 50 Hz power used in that part of the world. We also visited a site where another of the brothers is starting to build a collection of 76 dwellings, all duplexes. He is interested in hiring me as a consultant to make a *Green Village* with all the places powered by solar energy, so that the village becomes a net supplier of electricity to the utility grid. The system will include solar air conditioning for their hot muggy climate and solar hot water as well as electricity.



PV system built for the government to power a village

The plans are now for me to go back in March and work in that part of Sumatra; then go to New Guinea to bring power to the Papua villages that are on remote islands.



A Solar Workshop in the South Bronx

By Richard Komp and John Burke

When I came back from Indonesia to Long island NY, I went down to Washington DC, expecting to get on a plane to Chad West Africa, but that trip was cancelled after civil war broke out in the Chad government. Instead, Binta Terrier planed for me to work with African Diaspora people from Guinea. Two businessmen from Guinea, who now live in New York City, came down to Binta's home near Washington for a planning meeting and I rode back with them, planning to give a workshop there.

It took them some time to organize the workshop and recruit the students, so I went to Woodstock NY for a long weekend. While there I visited with my friends and was on Woodstock FM Radio for three hours Friday night. I stayed with a friend in her apartment on the very top end of Manhattan and on Monday the 15th of June I started to teach the workshop in an abandoned storefront in the South Bronx.



The Workshop building, which is planned to become a community center.

I had four students plus one of the businessmen for the workshop, which started about 5:30 in the evening, since the people have to work during the day. After starting with some PowerPoints on solar energy in general and photovoltaics (PV) in particular, we started to sort and cut PV cells to make small solar devices that could be sold to very poor people to bring some electricity into their lives. All the people plan to go back to Guinea to bring the skills they are learning and to start a company there to manufacture and sell PV modules and install PV systems on the small huts in the remote Guamanian villages. The entire project is to be financed by the Guinean Diaspora here in the US.

A couple of the students became very good at using the diamond cutting tool to cut the PV cells and they helped the others learn

. We put together one of the small white cased solar battery chargers that will recharge C,D and AA batteries (even non-rechargeable ones. Three of the students are business majors and they talked about that charger being one of the devices they could manufacture and sell in Guinea. Since I designed and own the injection molding die, I offered to let them borrow the die to make the cases in their country, like the Penobscot Indians do here in Maine, from recycled plastic.



The group cutting and soldering the PV cells to make a solar cell phone charger

John Burke came on Tuesday to bring workshop supplies and get introduced to the students, since he will take over the teaching of the course on Friday and for several days after that. John will teach the students how to build the bigger 65 watt PV modules using whole, uncut Evergreen Solar cells.

While they did very well cutting and soldering the PV cells, they had problems learning exactly how to connect the cells together in series to get the proper voltage necessary to recharge cell phones. While all cell phones seem to use the same charging circuit chip and need 5.1 volts or more to recharge; we use 12 cells in series which produces over 6 volts on a bright sunny day. We use the cheap \$1 picture frames you buy at the Dollar Store to show of your diploma; putting three strings of four cells in series in the case.

They had problems with that and had to redo two of the three strings, so we didn't finish the cell phone chargers by time to quit on Thursday night. Because it was Ramadan, nobody had eaten all day Thursday and had to leave early to break their fast, either at their homes or at the Mosque. On Friday, John directed them to finish the PV cell phone charger, but didn't have time to start building the 65 watt module. He will meet with them after Ramadan is over to continue the course.

I will be going to Guinea with two of them in October.



The Disparate Impact of Climate Change

By Sheila Suess Kennedy, Inequality.org |

Constitutional lawyers who work on issues of equal rights use the term "disparate impact," a term describing laws that—despite being facially neutral—have a very different effect upon citizens who are differently situated. Sometimes that different impact is intended; often it is not.

What brought that bit of "legalese" to mind was this recent headline in the New York Times: "Pope Francis to Explore Climate's Impact on the World's Poor." The article began by discussing a recent meeting between high-level representatives of the U.N. and the Pope:

Mr. Ban, the United Nations secretary general, had brought the leaders of all his major agencies to see **Pope Francis**, a show of organizational muscle and respect for a meeting between two global institutions that had sometimes shared a bumpy past but now had a mutual interest. The agenda was poverty, and Francis inveighed against the "economy of exclusion" as he addressed Mr. Ban's delegation at the Apostolic Palace. But in an informal meeting with Mr. Ban and his advisers, Francis shifted the discussion to the environment and how environmental degradation weighed heaviest on the poor.

The encyclical—which has now been formally issued—includes an economic critique of the way in which global capitalism has facilitated both the exploitation of nature and vast inequities among people—even people living in the same countries. That message makes the encyclical a distinctly political document, no matter how forcefully the Vatican insists that it is intended to be a statement of theology and morality, not politics. The ultimate effect of the Pope's encyclical is as impossible to predict at this point as is the ultimate outcome of climate change, but the Pontiff has raised two issues that are seldom recognized in the heated debates over climate policy: the interrelated nature of the policy decisions we make and the social and economic systems we institutionalize; and the wildly disparate impact of those decisions and systems on those who are "differently situated," as lawyers might put it.

The term "privilege" is usually connected to a descriptor like "white" or "male," but we might also consider what privilege means for other kinds of diversity in the context of global climate change. Similarly, we tend to think of poverty as the absence of money and material goods, but poverty includes many other deficits, including an individual's ability to withstand or recover from incidents of violent weather (Katrina, anyone?), to cope with economic changes and

job losses linked to climate change, and eventually, the means to move away from newly uninhabitable locations. Viewed in this way, "privilege" may mean having access to the resources needed to deal with economic and ecological upheavals, and "poverty" may describe those whose life choices are far more dramatically limited. Whatever else the encyclical does or does not accomplish, it illuminates an under-appreciated characteristic of inequality—susceptibility to disparate impact.

Honing the climate change message

By Bing Xue

Five years ago, I scheduled my first meeting with a local official to discuss carbon emission reduction in China. I had planned a polished and persuasive argument. First, I presented the main findings from the IPCC Fourth Assessment Report: Climate Change 2007. I then illustrated the various scenarios and the possible turning points we may see under the Kyoto Protocol and beyond. I concluded that we should spring into action to develop a lower-carbon-emission strategy to address global climate change within the regional developmental policy system immediately. The official's reaction surprised me. I learned that those in government didn't feel that climate change was a priority.

Rather, they were focused on sustaining local economic growth and maintaining socioeconomic stability. This was true despite sustainable development being a national strategy since 1994 (1) and the publication of China's first comprehensive policy initiative, China's National Climate Change Programme, in 2007 (2).

Based on this meeting, and the others that followed, I honed my message. Instead of emphasizing the local responsibilities in addressing global issues such as climate change, I now tell politicians that local efforts on reducing carbon emissions could lead to substantial cobenefits, such as reduction of local air pollutants (3), better economic performance (4), new economic growth areas, and job opportunities. I remind them that tax sources would be created by building low-carbon-oriented facilities. There has always been a language gap between scientists and local officials, particularly in the field of sustainable development. To address climate change effectively, we must bridge that gap. I found that advocating for science was possible if I could articulate our shared goals.

Bing Xue Institute of Applied Ecology, Chinese Academy of Sciences, 110016, Shenyang



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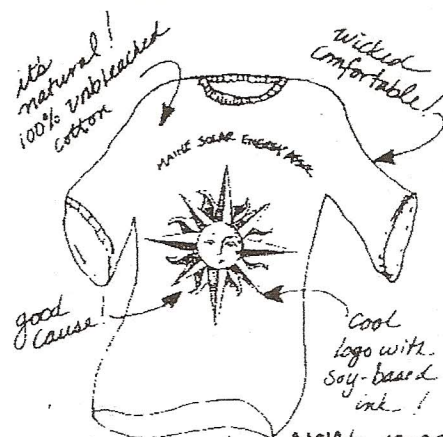
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