WINTER 2015

THE MAINE SUN

NEWSLETTER of the Maine Solar Energy Association

MESEA & DADS Complete our Solar Workshop in the Bronx, NY

By John Burke

After many set-backs, the Solar Assembly Workshop presented by MESEA and DADS with the group of interested folks from Guinea, W. Africa, in the So. Bronx, NYC (See Summer 2015 Maine Sun for earlier article) was finally completed in the North Bronx, with host Wyldon Fishman and the New York Solar Energy Society (NYSES), John Burke (DadSolar and MESEA) presented the final part of our solar assembly workshop series, making a 65 W solar PV module.

The small group from Guinea, West Africa and college students in NY area engineering programs had worked with MESEA and DADS last June on small PV battery chargers and cell phone chargers. These hands-on experiences will be used in Guinea to start a local business and share the solar technology with the communities in their country. Due to religious holidays, personal family conditions and an election in Guinea, the final workshops were put off a few times until the arrangement in early November 2015 with NYSES. We had hoped to attract more folks from the NYSES and MESEA advertising effort, but that interest did not materialize.

We did accomplish the complete assembly of the 65 W PV module from scratch, using solar cells from Evergreen Solar (formerly of Marlboro, MA). The gentlemen did get a full day of soldering cells and using the Sylgard 184 silicon encapsulation method, developed in Nicaragua by Marco Antonio of Grupo Fenix. After a delicious lunch prepared and provided by the NYSES host, we accomplished the final wiring and framing of the 65 watt PV module.

As in our one day workshop process, we had an earlier PV module (the 'turkey in the oven'), ready for these final steps, since the encapsulation does take a few days to cure completely. The module we soldered at the Bronx workshop will be used in the next PV assembly workshop. MESEA is using a less expensive EVA sheet encapsulation method, which requires a solar oven that will fit the required size of the PV module. (Or a pizza oven can be used, which wouldn't need the sunny daylight to accomplish). We have even used a wood stove for this process in Maine, and a possible hair-dryer heat has also been recommended, although not demonstrated to the group. We have photos of most of our solar assembly workshops posted on www.dadsolar.com, and photos with stories of the work of Dr. Komp in the developing world on the *International Work* page of our website.

website www.mainesolar.org

Cameroon 2015

By Richard Komp

The solar work trip to Cameroon came up rather suddenly. Last August I had a solar hybrid PV workshop at my place in Jonesport (see the Fall 2015 Maine Sun) and Marcel, one of the participants was from Cameroon. He told a fellow Cameroonian Catholic priest about my work in Africa and soon Father Eugen had me promising to go with him to his part of the country and teach the teachers how to build PV modules and how to use them. The whole project was sponsored by the Catholic Diocese of Kumbo in the English speaking area northwest of Douala.

In October I found myself on the plane to Douala, Cameroon's port city where Fr. Eugen picked me up (after being caught in a traffic jam for more than 2 hours). I wasn't waiting, I was trying to find out what happened to my checked luggage and filing paperwork with Air France to get it found and shipped to Douala (It finally arrived to where I was working in Kumbo a week later).

Getting to Kumbo

The road from Douala to Kumbo is in terrible shape but a very beautiful drive, with many waterfalls and mountain passes to see.

One of the waterfalls on the trip **(*continued on page4)***

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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

The Maine Sun welcomes articles, submissions, photographs, and letters. Please send editorial materials to the following address: MESEA PO. Box 184
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Phone: 207-497-2204
E-mail**: sunwatt@juno.com or mainesolarenergyassociation@gmail.com**
Website: **www.mainesolar.org**

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Calendar of Events

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

MESEA 'OFF-GRID' Solar Installation Workshop, next Spring in Maine

Date: a weekend in May, depending on your interest, either May 14-15, or May 21-22, 2016.

Location: A private home in Cambridge, Maine (details on receiving your reservation fee).

Description: A small, simple 'off-grid' solar PV system, for 'lights and radio / TV', to be installed with the 'hands-on' help of a 'limited number of participants'. This PV array will be a 12 V, approximately 260 watt total (4 x 65 W), with 12 V battery bank and charge controller, as well as inside and outside wiring, to accomplish the simple goals of the home-owner.

Cost: $50. per day, for full 'hands-on' participation (one or two day participation available). $25. Per day, for 'limited' participation (one or two day, without 'hands-on' experience). ($10. 'non-refundable' Reservation fee / deposit is required, asap, balance on arrival at the workshop. If your availability is limited, a deposit 'refund' may be made).

Contact: John Burke, (207) 546-1639, (other numbers added if necessary, 2016, Spring ME Sun) Please make reservations early, since the workshop will need a minimum # of participants, to allow attendance, also there will be a limited # of 10 'hands-on' participants.

As always, lunch will be provided by the MESEA, free of charge, thank you.

Help finance the National Solar Tour and other American Solar Energy Society (ASES) Work. Go to the www.ases.org website for the new deal with Amazon at their www.smile.amazon.com website Or Join ASES!

Climate Denialism: A Brief History

By Naomi Oreskes and Erik Conway, Adbusters

In the late 1970s, scientists first came to a consensus that global warming was likely to result from increasing greenhouse gases released by the burning of fossil fuels. This idea had been around since the turn of the century, but the development of computer models made it possible to make quantitative predictions. *(Actually, scientists **have** known this since the 19th Century – RK)* Almost immediately, a small group of politically connected and conservative scientists began to question this consensus. As empirical scientific data mounted up, their attacks became more unprincipled. These conservative scientists used data selectively and often misrepresented the conclusions of many studies undertaken by the scientific community.

In 1992, world leaders gathered in Rio de Janeiro to sign the United Nations Framework on Climate Change. President George W Bush promised to translate the written document into "concrete action". Three years later, the Intergovernmental Panel on Climate Change (IPCC) declared that the human impact on the earth's climate was no longer a prediction but an observable fact.

In the early 1990s, a group of skeptics claimed that Roger Revelle, one of the first climate scientists, had changed his mind about global warming and no longer believed it was a serious problem. The claim was repeated through several news outlets, including the *Washington Post*. When a graduate student named Justin Lancaster - who had worked closely with Revelle before his death in 1991 - tried to insist that Revelle had not changed his view, he was sued for libel. Lancaster was obliged to settle out of court. The claim was repeated again and again, and even today, exists on the Internet.

In 1996, when the IPCC released its second assessment report, stating that the human impact on climate was "discernible", a fossil-fuel-industry-funded group called the Global Climate Coalition accused the IPCC author Benjamin Santer of making unauthorized changes to the document, with the intent of creating a sense that global warming was more certain than it was. The following year, Frederick Seitz, chairman of the George C Marshall Institute, repeated the charges in the Wall Street Journal in an op-ed piece headlined "A Major Deception on Global Warming".

Massive Attack

Had Santer made unauthorized changes to the IPCC report? No: his changes were made in response to peer review. He was doing what every scientist is expected to do - and what IPCC rules required him to do - accepting criticism and using it so that the conclusions of the study were rigorous and clear. Frederick Seitz was a former president of the National Academy of Sciences, so it was not plausible that he did not know about the peer-review process.

In 2007, the claims were repeated in Unstoppable Global Warming: Every 1,500 Years, a book whose premise is that "human-emitted CO2 has played only a minor role" in contributing to global warming. The authors are Dennis Avery and Fred Singer. Singer is a physicist with a track record of challenging scientific evidence. He had taken part in the previous attack on Santer. Both the IPCC and Santer's co-authors took considerable pains to set the record straight, denying that Santer had done anything wrong. Yet, in their book, Avery and Singer reassert that "scientific reviewers discovered that major changes had been made 'in the back room' after they had signed off on the science chapter's contents" and that "Santer single-handedly reversed the 'climate science' of the whole IPCC report". The idea that any one individual could reverse the entire IPCC process is absurd, and yet, like the "Revelle changed his mind" claim, it remains on the Internet today.

Climate scientists have been subjected to repeated attacks of this kind. In 2005, Congressman Joe Barton of Texas demanded that Professor Michael Mann, director of the Earth System Science Centre at Pennsylvania State University, produce a huge volume of paperwork relating to his research. In February, Senator James Inhofe of Oklahoma accused a dozen climate scientists of criminal violations of Federal Law, based on alleged evidence contained in the UEA emails. Recently, Virginia's attorney general, Ken Cuccinelli, went after Mann again, asking that the University of Virginia produce thousands of pages of documents relating to Mann's research.

The government of Cameroon has had only two "presidents for life" related to each other (we used to call that kind of ruler *Kings*) and the government of Kumbo is part of the opposition so the *King* is not fixing the roads in that area at all as punishment for their lack of loyalty. Unfortunately, this kind of lack of concern for the needs of the people is all too common in African countries.

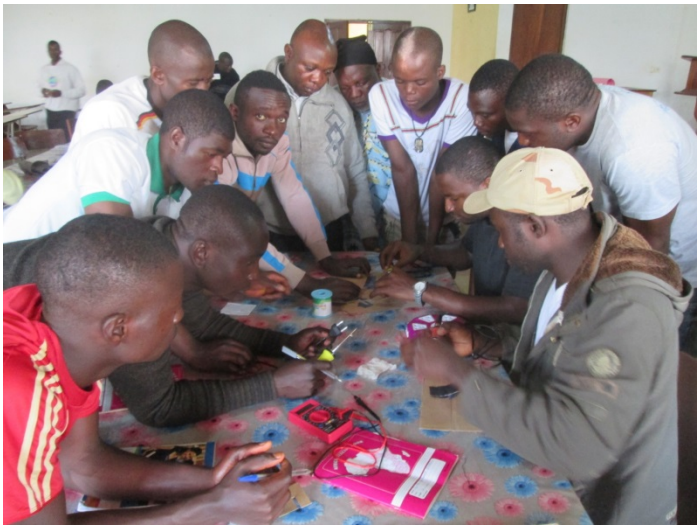
The 400 Km (248 miles) took ten hours, because we stopped to fix a flat tire (common in these African roads) and then stopped again in the Archdiocese headquarters in Bomeda to deliver a big box of clothes donated from the US. We finally got to the Bishop's House in Kumbo where I was to stay for the rest of the time in Cameroon. They put me up in the *Cardinals' suite*, which was very nice with a sitting room, bedroom and my own private bathroom. I had to repair hardly any of the plumbing, just fix the toilet seat (Most of the toilets I encountered didn't even have seats so I was happy with that). Since all my clothes were in the missing suitcases, one of the nuns found some underwear, sox, a shirt and a brand new pair of pants that fit me well enough. I took breakfast and supper in the bishop's dining room and was fed more than well enough (I gained weight). I also met the man who became my assistant (as well as one of my students) and the first day after I got to Kumbo, we spent going around the town seeing what was available and shopping for the tools and materials we would need to make the photovoltaic (PV) modules we would build in the 2 ½ week course.

The Solar Course

The course was taught in a retreat center up the hill from the Cathedral and Bishop's House. Kumbo is in the mountains so the retreat center is about 7000 feet above sea level and nice and cool for a place only 11 degrees north of the equator. The bishop had already gathered the students so I had 30 students, including 10 parish priests. I will be "teaching the teachers" who can go out and teach people in the surrounding villages how to make their own PV modules and wire up their homes for solar electricity.

I started the course with two days of lectures on solar energy in general and photovoltaics in particular: how PV cells work and how they are made, as well as how to wire them up in series to produce the voltages necessary for the different uses of solar electricity. Finally my luggage arrived with the 1000 PV cells and special tools like multimeters and diamond disk PV cell cutters so we could get to work building PV modules.

For this full report and much more, like back issues of the Maine Sun - go to Our www.mainesolar.org website



Students cutting and soldering the PV cells to make solar cell phone chargers.

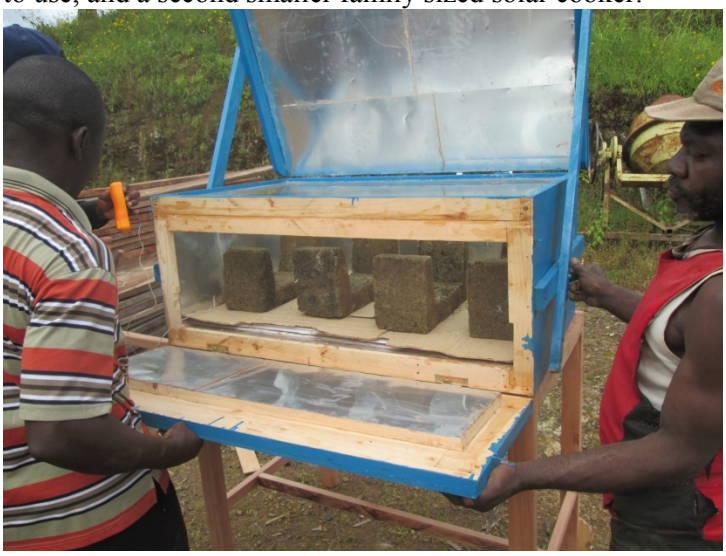
As I normally now start the course, the first hands-on project is to build solar cell phone chargers. People in 3rd World places use cell phones extensively since land lines are very scarce and unreliable. These solar cell phone chargers will work with any cell phone **except** the Apple iPhones. However, that is not a problem since virtually nobody in the developing world can afford the luxury of an Apple device.

Next we built small PV battery chargers designed to recharge C,D and AA batteries, even "non-rechargable" ones. I had brought six white plastic cases for the chargers (made for my by the Penopscot Indians out of recycled plastic. After they were working perfectly, we made a different design developed by the Grupo Fenix in Nicaragua that has the battery holders connected to a tiny 4 cell PV module by a wire; so that the batteries can be in the shade while the PV module is in the sun. This keeps the batteries cooler in tropical locations.

Finally we made 16 watt, 17 volt PV modules designed to power single room huts in the "informal communities" (which used to be called *Squatter settlements*). All these modules can be made using a technique that can be done without a heat cured encapsulant. I explained to the students that they should help first, those in most need of help. Even in 3rd world villages and cities, some people are much poorer than others and should get the solar electricity first. We discussed how to set up microloans so the clients can pay for their solar electric system. It is a bad idea to simply give them the system since then, it is not properly taken care of. The Grupo Fenix developed these processes years ago, after making enough mistakes. Remember, the social process is far more important than the technology (although the technology has to be superb as the starting place).

Making Solar Ovens

In order to build PV modules bigger than 16 watts, we have to use a plastic sheet material called Ethylene Vinyl Acetate (EVA), which has to be heat cured to about 120º C (250º F). This is the way all the commercial PV modules are encapsulated, using half million dollar robotic laminating machines. About four years ago, we developed a way of using solar ovens to exactly the same job *(see the Summer 2013 Maine Sun)*. The next part of the course is teaching how to build such a solar cooker. The Diocese has a very good carpenter workshop with big, high quality German power tools. These operate on 3 phase 380 volt, 50 Hz power, which is rarely available from the poorly run, overloaded utility grid so we had to wait several days until one morning the power showed and they could cut all the wood necessary to build the solar ovens. We built two, one designed big enough to take the biggest glass we expected to use, and a second smaller family sized solar cooker.



The new solar cooker loaded with two large PV modules ready to be heat cured. The master carpenter is on the right side of the photo.

The carpenter shop is run by a very good cabinet maker so I simply showed him a PowerPoint of the Grupo Fenix people building such solar cookers in Nicaragua and Peru and let him work out his own design to fit the glass. He came up with some innovations that I will pass on to the Grupo Fenix people when I get down to Nicaragua next month. Because of the delay in getting electric power and cloudy weather we didn't finish heat curing the PV modules before I left, but I have heard that they came out well done.

One of the lecture sessions was devoted to designing a PV system to power the entire carpenter shop complex and take it off the grid. The shop personnel are waiting to celebrate the day when they will invite the power company workers to come and take the power lines away. This project will cost about $10,000 and will be done with a set of big 65 watt PV modules cooked in the solar oven.

The Final Celebration and Plans for the Future

On the last days I was in Cameroon, two of the priests took me around to schools that need solar electricity. I worked with students, teaching them how to design PV systems for these different size applications. I gave them copies of the software I developed many years ago (and have now ported to MS Office 2010) and taught them how to use it. We came up with approximate weather data for that part of Cameroon to use in the software (but I would still like to find more accurate data).

On the last day before I left, the Diocese gave me a going away celebration. The students brought samples of all the different PV modules they made (except for the biggest modules, which were still in the big solar oven).

The Family size solar cooker with the students holding all the smaller PV modules. The bishop and I are in our fancy outfits. I received the Cameroon Chief's outfit as a gift.

One of the weekends, I was taken to the Catholic University in Bomenda to give a two hour seminar on solar energy. One of the results of the seminar is that I will givew an intense week-long solar course when I come back to Cameroon next May or June.. I have promised to come back two more times toget the program going properly and hopefully have a small solar collective or company going there, separate from the Diocese.

While I was there I visited Sister Linda (the aunt of Marcel, the man who had come to our workshop in Maine and started all this work). Sister Linda is a Franciscan nun and we met in the big Franciscan convent near the University. The Mother Superior amd other head nuns had a meeting with me about the convent's needs for solar electricity and solar hot water at the ***(continued on page 6)***

(continued from page5) convent and elsewhere. We came up with a tentative design plan for PV-Thermal Hybrids of the type we have recently installed on my place in Maine and came up with a budget, which will be tens of thousands of dollars. Of course, the Mother Superior now wishes me to start a program in the US to raise all that money. When I get to Florida, I will see what I can do to organize such a fundraising project.

The Trip Back to the Airport

We left Kumbo at 9 in the morning to get me to the airport by 9 pm to catch my Air France flight back to Paris and Boston. The reason for the early departure became evident when we had climbed through the first mountain pass and reached a flat elevated plateau with a river winding alongside the (mostly dirt) road. It had rained hard all the night before and the river was flowing over the road. There was a traffic jam where people had started building a dam alongside the road to divert the water flow to where they were building a new bridge over the river.

Building the diversion dam along the main road in the country.

This project, organized by the truckers and the people themselves, took about 1 ½ hours. No police or government people were anywhere around. Finally the water over the road was low enough that trucks and most vehicles could proceed. Our Toyota Hilux 4 wheel drive pickup was a Real SUV: diesel engine, manual transmission, manual window cranks and door locks. Those diesel engines will run under water and the only electrical thing down low is the starter. That is why you have a manual transmission: When the starter stops working after going swimming a few times, you can push start the truck in 2nd gear.

After a nice, but inexpensive lunch and taking time out to buy and install a used tire on the truck, we made it through the Douala traffic jams to the airport at 8:30 pm, perfect time for me to check in at the Air France counter and, and wait to get on the plane back to Paris.

I am already in contact with people about my next trip to Cameroon, where we will go into the countryside and install the PV systems they will be building while I am gone. Cameroon is a very beautiful country with virtually no tourists and I love working there.

‘Grow a Brain’ Go Solar for a Future? Global Climate March, Paris Talks ?

By John Burke

Some folks say they 'love solar energy' ... Well, whole civilizations were based on the love of the sun and the 'rising' every morning of the warming solar energy, ... their religions were based on the love of the sun and the solar energy, the bringer of life!

The sun did interact, over millions of years, with the rotting carbon material, to form deposits of 'fossil fuels', oil, gas, coal. Now, we see, after more than 150 years of burning fossil fuels, and the industrial revolution, more and more 'greenhouse gases' emitted into the atmosphere of the Earth. The 'blessing' of these fuels is accelerating the 'global warming' effect, to the point that has 'never' been in our recorded history, this 'warming', is exactly what we are experiencing, now!

A 100% renewable energy future can be achieved with wind and solar, if we get the process moving, now! The technology and the funding exists, now! The fossil fuel addiction, the world over, is what we have become used to and the 'habit' is holding us back from the necessary steps.

So, 'Grow a brain'?, and stop listening to the Big Oil, profit motivated corps. and those that say, 'not to worry'. Anger and worry are only a moment that may inspire the 'actions' needed ... for a future our children and grand-children can appreciate!

Maine Solar Energy Association received a ‘comment’ this fall from a ‘lover of solar energy’, who felt compelled to post on our page, that we should ‘Grow a brain’, ‘Global warming, come on people’ ! Well, this comment inspired a response, printed here, above, for you all to read and agree or disagree with. The situation we are facing, is of a magnitude, most do not realize as yet. Can the humans save the Earth? Can the humans save the human civilization? The challenge may be the greatest of our short civilization. Can we ignore this, or just go solar and survive?

There were marches and events, around the world this past week (Nov. / Dec.), and we attended, with a small group of 1000 folks, marching around NY City Hall, Nov. 29, this in support of the UN Climate Talks in Paris, COP21. It seems the oil corporations were also in Paris, attending the talks, ***(continued on page 7)***

From page6 and maybe there won't be any 'real' climate action coming out of this episode.

Our focus at the Maine Solar Energy Association is to promote the general awareness of solar energy, and through educational seminars and solar assembly workshops, we accomplish this focus. We need members, folks that don't mind supporting our efforts with small membership fees yearly. MESEA is the Maine state chapter of the American Solar Energy Society (ases.org). Please learn of just how solar and renewable energy can help the humans, and you. Thank you, see our website at www.mainesolar.org for more details.

SPECIAL SALE of PV MODULES By MSA

In addition to the still available 250 watt Certified photovoltaic modules being sold by MESEA for only $1 per watt, we also have a few modules that are broken but still work perfectly. These modules are half price at 50 cents / watt and can be used with either12 or 24 volt systems. Available for only $125 for the 250 watt size, and cheaper for those that are of smaller wattage.

For information: 207-497-2204 or 516-679-9090
E-mail: sunwatt@juno.com

Coming:TheThird Edition

Now 36 pages with new material

The Maine Solar Primer

A compilation of practical information and diagrams from past issues of THE MAINE SUN

The Maine Solar Energy association has published a sourcebook for solar and other renewable energy resources in Maine and New England.
This booklet includes do it yourself plans and basic solar information for everybody.

The Maine Solar Primer is available for $12 inc. postage from MESEA, PO Box 184, Harrington ME 04643

MeSEA Membership Form

Annual membership includes: a subscription to the quarterly MeSEA publication - *The Maine Sun,* 10% discount on workshop fees and MeSEA-sponsored events, networking with other like-minded people in Maine, contribution to the sustainability of our program, and the right to declare your donation to a 501(c)(3) on your taxes.

Special Joint MESEA – ASES Membership: $60 ***Go to the www.ases.org/join/ website to sign up with a credit card.***

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