

Strawbale demonstration coming up soon, see “Magnolia” below.

Jamaica Solar Project

We continue to work on equipment to send to Jamaica. We will be sending down a shipment in the next few weeks that will include the tools to set up a commercial breadfruit operation, all daylight drive. (COVID 19 has been creating kinks in supply chains that have slowed the arrival of some needed parts.) The Jamaican farmers who use these tools will be able to process their breadfruit without coal, nuclear, oil, fracked natural gas, or industrial renewable energy systems. It is our hope that others will see this equipment in operation and seek to emulate it. We may send someone down there soon as well to look more closely at our options for expanding daylight drive and durable solar kits in Jamaica.



Breadfruit grinder, headed for Jamaica, daylight drive DC powered. No fossil fuel or industrial solar needed!

New Solar Cooking Technology

We were very pleased recently when a supporter on our list sent us a link to a new solar cooking technology being developed ‘open source’ by a professor in California, Peter Schwartz. He and his colleagues refer to this technology as “radically inexpensive solar.” That terms means “direct drive,” or “daylight drive” in the LEF parlance. I had to chuckle when saw that title, thinking “yep, that’s what we been saying for a while now.”

They have developed very small, low-power input, highly insulated solar cookers. The idea is pretty simple. You put solar electric heat coils in a well insulated cooker. The insulation (and perhaps thermal storage) compensate for the low power input. See [Cooking for the Global Poor at http://sharedcurriculum.peteschwartz.net/solar-electric-cooking/](http://sharedcurriculum.peteschwartz.net/solar-electric-cooking/) and [Radically Inexpensive Solar Electricity at http://sharedcurriculum.peteschwartz.net/direct-dc-solar-research/](http://sharedcurriculum.peteschwartz.net/direct-dc-solar-research/)

On paper, it would seem like solar heat concentration using parabolas would be simple and cheap. It isn’t. The reality is that solar photovoltaics and simple resistance coils are by far the cheapest, easiest form of solar concentrator on the planet, but *only if they are used in a daylight drive configuration*. Schwartz and his team are using erythritol (a sugar alcohol) as a thermal mass because it goes through a phase change just above the boiling point of water. In considering these ideas in the past, I had thought about using mineral oil as a heat storage/ transfer medium. That was not pursued because mineral oil is too much of a fire hazard. We have also considered using solid thermal mass (metal or clay or some such). I could not convince myself that it would work all that well. But now seeing the work Schwartz and his team have done, it’s very clear, this is a history-changing idea. Cooking is a huge issue globally, and one we have not resolved fully at LEF. (Our upgraded biogas system will be done soon. There is no way we could get through a Virginia winter on solar cooking alone. Biogas is storable, and is hopefully going to displace the gasoline used in our small farm tractors. Solar and biogas thus complement each other very nicely.) This new cooking technology is not a magic bullet, but it is big step in the right direction. Though our to-do list is long, we are going to add this item to it.

The Schwartz team has made great progress. We are going to build their design. (They call them ISECs, Insulated Solar Electric Cookers.) They are using resistive heaters – basically taking high voltage stove-top electric coils and cutting them into sections appropriate for lower voltage. We are going to try pre-made coils in both low voltage (to make very cheap cookers) and higher voltage models (more suitable for a community setting like LEF). We are also going to try using simple thermal mass, such as iron filings, magnetite, or just packed clay, instead of erythritol. A little more mass offsets the energy gained from phase change, and it should make for a much simpler construction process. We are also going to try PTC thermistor heaters instead of simple resistance coils. The thermistors are self-limiting, which eliminates the need for thermal switches. The efficiency of thermistors versus simple resistors (nickel chromium, usually) is not clear at this time. We have two interns who are going to start working on this project right away. If the current ISEC design works well for us, we can take it to Jamaica, Arizona, and elsewhere. If a simpler model using thermal mass works, we can likewise take that to people who need it.

The modern corporate economy has no interest in making products for low-income people. That is why simple ideas are often ignored in favor of more profitable ventures. Schwartz has been communicative with us, and we are part of the open-source design process at this point. We are very excited about this new project. Sustainable cooking equipment is on the critical short-list of things we need for our collective future.

Magnolia

Magnolia is a house near LEF that is under our management. We are taking it off grid. We will be wrapping it in straw bales in the next few weeks. If you are in the area, you are welcome to come and see that happen. We will have socially-distanced observation areas set up (not too far away from the action) in marked areas. Everyone is asked to wear a mask. We will NOT have bathroom facilities available for the general public. Please plan accordingly. Date and time TBA.

Simplified Combine Harvester

Over the Christmas holidays, we were able to put a lot of time into research and drawings of our second generation simplified combine harvester. This, like cooking, is a cornerstone sustainable technology that is critical for our future well-being and survival. Like better solar cookers, the modern corporate economy is not concerned with the issue. We have put a lot of time looking into the designs and patents of combines and harvesting for machines going back to the early 1800s. At this point, we are confident we can build an effective, efficient machine that costs about 80% less than the smallest combine harvester currently being manufactured. We hope to have a second generation prototype built by wheat harvest time this year (late June). Wish us luck.



Magnolia House, windows boxed out and foundation ready for straw bales.

Making the Localization Revolution Happen

There is a revolution under our fingertips, waiting to happen. We have the tools to decentralize the industrial

economy in favor of self-determined communities. The systems we are developing at LEF feel like an important, if not widely recognized, part of a future sustainable (we hope!) decentralized economy.

Lofty ideals are hard to argue with, but what do they mean here and now? We are trying to promote practical, effective solutions. For LEF in particular, we have improved our financial situation, and that gives us more flexibility. We took on a project last year to distribute sweet potato slips in conjunction with Southern Exposure Seed Exchange. That and donations to the LEF Education Fund (thank you!) have pulled us out of the financial hole we dug in sending solar kits to over 50 homes in Arizona. We are excited about solar cookers, biogas, and the simplified combine harvester. Those projects will require the expenditure of a few thousand dollars, which we can handle at this point. In thinking about Jamaica, I hope we can send someone down there soon to assess our options more closely. Our Jamaican friends are pulling together resources to set up their own solar energy cooperative. We have and will support them any way we can. We are trying to assess the best course of action for LEF. More direct involvement/ investment is one option.

A sustainable economy would be far cheaper than the consumer madhouse of modern corporate capitalism, but the people who have control over the bulk of the money and resources are not interested in decentralized solutions. We have to make due with the scale of resources at our disposal. If we could take \$100,000 to Jamaica, I think we could plant the seeds that would in the coming years make the global electrical grid superfluous. We would spend money on direct drive equipment, as well as household DC lights and appliances. If we could distribute that equipment on a scale that people could see the benefit, and *have easy access to equipment and appliances that run without fossil fuel or industrial “renewable” energy systems*, then it would grow. It simply will not grow if the ordinary person of low to moderate income in Jamaica (or elsewhere) does not have easy access to the tools they need to live grid-free.

People have asked us from time to time why we not have patented some of our DC Microgrid. Well, firstly, none of it is patentable. It's all equipment that's been around for a while. And secondly, any patents would be counterproductive. The point is to disseminate the ideas, not profit from them. Schwartz and his team are pursuing the insulated solar cookers as an 'open source' project. That's another approach. Mark my words, you will see the mass manufacture of such cookers by Chinese (and perhaps East Indian) manufacturers a few years from now.

The simplified combine harvester we are pursuing is patentable. It would be disastrous to put that patent in any individual's name. If something happened to that individual and some corporate entity gained control of the patent, then they might just decide to suppress it rather than develop it. The various conspiracy theories about suppressed energy technologies are mostly, but not entirely, bogus. We have been privy to some first-hand stories about the suppression of the development decentralized DC systems, both direct/ daylight drive, and battery systems. Those stories do not need to be put into print. Attempts at the suppression of DC systems is going to fail over time. Photovoltaic panels put out DC electricity. They are now a cheap and widely dispersed energy source. The distribution of DC equipment is exploding in Africa and Asia. Sadly, the distribution of nickel-iron batteries is not growing, because they are expensive, and ultimately their efficacy is limited by the bulk-energy mentality we inherited from the AC grid. Nickel-iron batteries are a tremendously effective technology when used in the context of a DC Microgrid that uses thermal storage and thus reduces the need for battery capacity by 90% or so. They are not an environmental solution when applied in the dominant bulk-energy systems.

In consideration of these various issues, we are putting together a possible attempt to patent the simplified combine harvester, and put the ownership under a 7 person collective of people who understand the social mission of LEF and the combine itself. We are not committed to this course of action yet. We are simply trying to make it possible. The idea is that the combine design could be given for free to any local producer, particularly in African countries or other areas where low-income people need the machine. Limited production rights under the patent could be sold to any mass manufacturer in an industrialized country. No single entity would be given control out of concern the technology could be suppressed rather than developed. Would the big

machinery companies be interested? Maybe, maybe not. Will the machine really work well enough that anyone will be interested? Probably. Will there be enough interest to justify the work put into getting a patent? Don't know. Could profits from the patent support a broad-scale expansion of DC Microgrids that facilitate making the global grid superfluous? Maybe. Is this all just too pretentious? Maybe. We are considering our options. Your thoughts are welcomed, as is your support.

Living Energy Farm is a project to build a demonstration farm, community, and education center in Louisa County that uses no fossil fuels. For more information see our website www.livingenergyfarm.org, or contact us at livingenergyfarm@gmail.com or Living Energy Farm, 1022 Bibb Store Rd, Louisa VA, 23093. Donations to the Living Energy Farm Education Fund are tax deductible.

Articles and videos about LEF:

How to Never Pay an Electric Bill

<https://www.youtube.com/watch?v=N5Wk7inoIxI&t=201s>

This video is a walk-through of our energy systems at Living Energy Farm. It is a concise summary of how these systems work, and why they are not in common use already.

Solar Installations In The Navajo (Dine') And Hopi Reservations, March 2020

<http://livingenergyfarm.org/solar-installations-2020/>

This is a photo essay about our project to bring durable solar energy systems to the Dine' and Hopi Reservations, where thousands of people live without grid power involuntarily.

Support Living Energy Farm's Climate Justice Campaign, and Bring DC Microgrids to People Who Need Them

<http://livingenergyfarm.org/support-our-climate-justice-campaign/>

This is an updated web page describing our broader social justice ambitions.

How to Live Without Fossil Fuel (Introductory Video) <https://www.youtube.com/watch?v=Ri2U6u8p65E>
Powering a Community with Solar Electricity (LEF has the only DC powered community that we know of, here's how it works) <https://www.youtube.com/watch?v=FvdExgvHnRI&t=23s>
The Best Way to Store Off-Grid Energy Batteries that Last (almost) Forever <https://www.youtube.com/watch?v=2wOxQ3sL9zc>
<https://www.youtube.com/watch?v=dfrgLsyFs0E>

Virginia Homegrown created a program at LEF (the LEF part starts at the 29 minute mark in the program)

<https://www.youtube.com/watch?v=MDGP0C9MIzU>

International Permaculture has done 2 articles on LEF. One is in issue #93, Autumn 2017, and the second is in issue #94, Winter 2017. See <https://www.permaculture.co.uk/>

Article about LEF at the Atlantic Online Magazine

<https://www.theatlantic.com/politics/archive/2017/01/anarchism-intentional-communities-trump/513086/>

Article about LEF in The Central Virginian

<http://www.livingenergyfarm.org/cvarticle.pdf>

LEF on CNN

<http://www.cnn.com/interactive/2015/09/us/communes-american-story/>

Cville weekly in Charlottesville VA

<http://www.c-ville.com/off-grid-model-environmentalism-made-easy/#.VcHobF054yo>