

Living Energy Farm

August - September 2021 Newsletter

We normally keep pretty busy at Living Energy Farm. More so than usual these days. We have been working hard to design and acquire solar ovens, solar water pumps and other appropriate technologies for the Jamaican market. We have begun putting together the small grain harvester. We have begun putting together a shed to support solar panels at Magnolia House so we can take that house off grid. We have put our new, larger biogas digester into operation at LEF in preparation for making more fuel for cooking and running farm equipment off of biogas. We planted a larger than average seed crop this year, and we have been busy harvesting those seeds. We are drying and canning lots of vegetables and fruit for this winter. The kids are going back to school at the cooperative homeschool program, and we have an excellent crew of people at the farm these days.

LIVING ENERGY FARM NEEDS YOU!

Do you have extra solar panels laying around? We want them. Want to help us organize events to explain what we are doing in Jamaica? Let us know. (Contact livingenergyfarm at gmail.com.)

We have been saying for years that a good DC Microgrid makes grid power unnecessary, and can thus dramatically reduce the need for coal, natural gas fracking, nuclear energy, or industrial “renewable” energy systems (which are not as benign as they are purported to be). The value of our DC Microgrid has taken us to Jamaica. We have a strong organization there, grid power is weak, and a lot of people do not have what they need.

Grid power is alternating current, or AC. Photovoltaic (solar electric, or PV) panels make DC electricity, and it is far more efficient to use DC power directly (as opposed to trying to store it in batteries or convert it to AC). The impediments to spreading DC power systems in the past have been the cost of PV panels, a lack of knowledge of the efficacy of high voltage and daylight drive DC equipment, and a lack of easily available DC tools and appliances. The cost of PV has plummeted. We are spreading information as quickly as possible about the efficacy of daylight drive and high voltage DC equipment. That leaves us with the third big problem -- making the right equipment available.

Jamaica imports most of its food, even though they have a tropical climate and good soil. The problem is that Jamaican farmers struggle to earn a decent living. The Jamaican government has set up a number of programs to support the expansion of food production. Simple irrigation pumps would help a lot with food production, both at the household level and on larger farms. But pumps and the means to power them are expensive -- up until now, that is.

In our work with the Cal Poly crew developing better solar ovens, we got into a conversation with a relief group working in Malawi in Africa. They have found a small DC pump that is reliable. That’s saying something, because most cheap DC pumps burn out very quickly. We imported some samples, tested them, and now there are 200 of them on their way to Jamaica.

The bureaucracy moves at a snail’s pace in Jamaican government. But we have a joint board of Jamaicans and Americans on the board of a forming non-profit that will be fully empowered to distribute solar equipment in Jamaica. (In Jamaican parlance, non-profit is a category in between for-profit and charitable, the latter being similar to an American 501-c-3.) The company is called



Low-pressure Chinese made brush motor sump pumps that can run directly from a PV panel. The cheapest decent little pump we have ever found, these could make a big difference in the lives of many people who have little money.

Living Energy Solutions, and we hope to have the paperwork finalized in the next few weeks.

In the last year, we received over \$20,000 in donations to do this work. We have been working furiously these last couple months to try to get Living Energy Solutions up and running. With the resources we have in hand, we are going to be able to do the following:

1) Set up a metal fabrication shop in eastern Jamaica, which is the poorest part of the country. We have already purchased a metal shear and brake (cutting and bending tools). These are professional quality tools, not cheap junk. We have access to a decently sized workshop. These tools will give our Jamaican friends the ability to make battery boxes, solar ovens, and to innovate their own solutions.

2) Sell very cheap but effective water pumps. Our Jamaican friends have referred to these pumps as “a game changer.” The cost-per-impact on these little pumps is phenomenal, and they could make a big difference for front yard gardeners and farmers alike. And they run daylight drive, direct from the PV panels.

3) We are going to distribute the best solar cookers in the world. Since last Christmas, we have been working closely with a group from Cal Poly designing and building Insulated Solar Electric Cookers, or ISECs.

(See <http://sharedcurriculum.peteschwartz.net/solar-electric-cooking/> and

<http://conev.org/ISECmanual14.pdf>)

We designed our Perl bucket cookers, which are made with a 5 gallon bucket and perlite (which insulates and does not burn). We sent 10 of those down to Jamaica in spring. The people who have them are pleased to have them, but the Perl cookers are not (we are told) something people would want to buy because they are small and don't look great. Since Alexis got back from Jamaica in late July, he has been working with new cooker designs to try to find the right balance between cost, cooking effectiveness, and aesthetic appeal. At this point, it looks like we are going to distribute two kinds of box cookers; Blue Roxy, an inexpensive box cooker wrapped in non-burning aramid cloth, and a slightly larger, nicer cooker called Roxy Deluxe that looks and operates much like a “real” oven. (See photos.)

4) We are also going to be able to distribute solar PV panels to power these devices and more. Basically, we are looking at adapting LEF's microgrid to household/ farm



Roxy Deluxe, the nicest solar cooker we have ever made. These ISEC cookers can cook in partly cloudy weather when it's bitter cold outside. No other solar cooker on the planet can do that.



Roxy Deluxe with the door closed. These will probably be marketed soon through Living Energy Lights (.com) and in Jamaica.

scale systems for Jamaicans. Thus we can make and sell solar kits ranging from a 100 watts up to several hundred watts, with the same set of panels pumping water, cooking food, and doing other very useful things, most of it daylight drive. We have 100 panels in route from a supplier, and another 20 donated. We are looking for more.

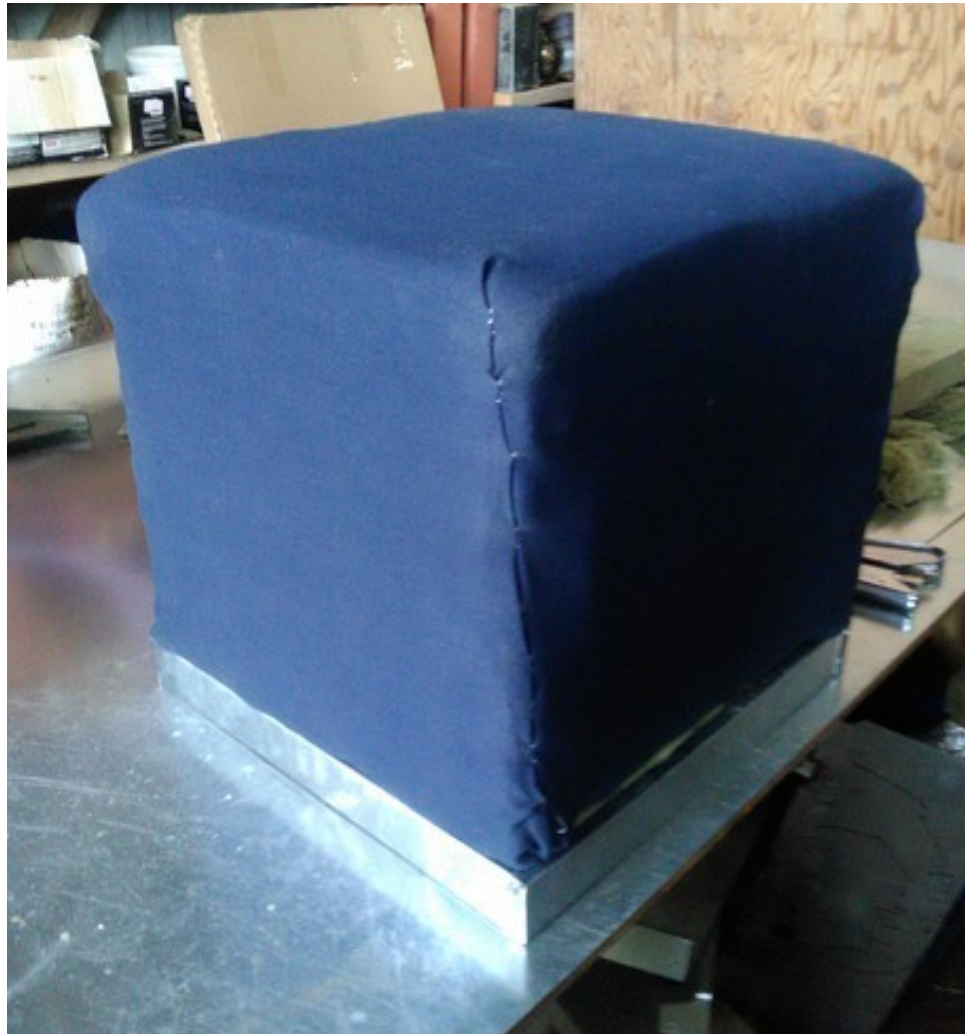
5) We are equipped to consult with people in Jamaica set up their own daylight drive DC equipment. We may stockpile some industrial DC motors to make it easier for farmers and businesses to convert their own equipment.

That's all the good news. The bad news is that the "MOQs" are killing us. Those three letters stand for "minimum order quantity." Everyone on our project agrees that we really want to offer nickel iron (NiFe) battery sets. NiFes last for decades. They are far more durable than any other battery, and people in Jamaica who are living involuntarily off-grid are not interested in disposable solar junk (nor are we interested in selling it). We have been quoted prices everywhere from five dollars to \$26 dollars per amp hour for NiFe batteries. We have an excellent quote from our favorite supplier at \$5.60 /amp hour for moderately small NiFes that would be great for Jamaica. The order is \$31,000 with shipping. We will need to buy other parts to complete the construction of the solar boxes as well.

Small good quality fans (there are lots of crummy ones) have a 1000 unit MOQ. We are looking for something with a lower MOQ. We decided we want to carry a very small, inexpensive lithium battery solar kit for low-income consumers who cannot afford the NiFe sets. (With higher quality, replace-able lithium iron phosphate batteries, the best among the lithium options.) The MOQ is pretty modest on those, but it's still money we just don't have right now.

Where does that leave us? We really, really, really want to offer NiFe batteries in Jamaica. We have dealt with numerous suppliers in the last few years, and we know which ones we want to deal with at this point. We are going to try to raise money to buy the NiFes. We want to buy them from ADS in Ukraine. That company has been making the same reliable batteries for a long time. Ukraine is a democratic country where workers have far more ability to organize than in China.

Here's what you can do. If you have solar panels you can donate, we would be most appreciative. We can ship them down while we are shipping down other equipment. That can help us build up Living Energy Solutions. Want to organize an event? Let us know. We would love to speak to people, online or in person (as reasonable covid precautions allow -- perhaps outdoors?). If you can support us, that would be great.



Blue Roxy -- the whole lid lifts off. It is much cheaper and faster to build than Roxy Deluxe, but looks nicer than a 5 gallon bucket wrapped in tape. The outside is non-burning aramid cloth.

Bad Smells and Biogas

We have been running a biogas digester for a couple of years now. The digester we just retired is a few hundred gallons. We want more reliable cooking fuel, and we want to fuel small tractors. We took a 2000 gallon water storage tank and converted it to a digester. We just finished banking the new digester under two layers of straw bales. We disconnected the solar heating coil that was heating the old digester (connected to a solar thermal panel, just like you would use to heat water) and connected it to the new digester about a month ago. And then something pretty amazing happened. The old digester kept right on producing gas, quite a lot of it. We tell people that a biogas digester needs two things -- it needs to be warm, and it needs to be fed regularly. Well, we have to modify that a bit. If you get a good anaerobic culture going, then it will put up with a lot of neglect and change. But it takes a while to get to that point. The new digester isn't making much at all yet but some very bad smells. The smaller digester was like that when we first started it up. Good thing these things live outdoors.

Living Energy Lights

A couple of years ago, we incorporated Living Energy Lights (LEL), an LLC that could bring in investors from outside of our farm and market some of the products being developed at LEF. We have been selling a bit of equipment along and along, but we have not been focused on it. Americans generally want big systems for their private houses. Working to help people who need basic services in Arizona and Jamaica has felt more pressing. In looking at our situation now, we are going to start putting some more work and investment into Living Energy Lights. Money is useful stuff, but we are not shopping for ways to make more income for the farm exactly. We want other people to use our technologies, and selling some of those technologies is a way to promote them in an ongoing way. It also can help a whole lot with that rather pernicious MOQ issue. If we can cover an MOQ by sending some equipment to different entities, that works. We are very clear that we do not use donated money for our personal use on the farm. Our farm income has improved in the last couple of years (owing mostly to our managing sweet potato slip sales for Southern Exposure Seed Exchange), but we can't afford to take too much resources out of our farm budgets for our far-flung ventures. If you are donating to LEF, be aware that the resources you are donating are being used for larger purchases that are being split between a non-profit entity in Jamaica and a for-profit entity in the U.S. All of your money will go to Jamaica. Materials coming into Living Energy Lights will be paid for by LEF and other investors (if we can find some...).

Living Energy Lights is, not coincidentally, going to be able to offer the same products as Living Energy Solutions in Jamaica -- solar cookers, consulting services, refrigerators. (The small pumps we are shipping to Jamaica are not

something most Americans would want.) LEL is a dealer for the Sundanzer refrigerators. That particular machine is the best solar refrigerator on the market. We are working on adapting cheap DC refrigerators for the Jamaican market that would run daylight drive, but we have nothing in hand yet. We would love to offer the ADS NiFe battery sets in the U.S, but we just don't have the resources to do that right now. We may or may not bring any lithium solar kits to the U.S. That market is saturated.



Rosa and Nika are quality checking a 44 pound watermelon. Oh the hardships of off-grid living....

The Prize

If you imagine sitting in a farmhouse in the 1930s with no electricity, then the arrival of grid power must have seemed like a miracle. Instead of smelly, smoky lanterns kerosene lanterns that were a constant fire hazard, you get to have bright light, and the bill was small. There were no PV panels back then, so grid power had to be based on centralized boilers. (There were, in fact, some nickel iron battery kits made by Thomas Edison specifically for farms, but lacking PV power or daylight drive, they had to be charged with a generator.) Before PV power, grid power was the only convenient, effective way to have reliable lights. Soon after grid power arrived, so did a host of useful, and useless but entertaining, electrical devices.

With the advent of PV panels and the arrival of a new environmental movement in the 1970s and 1980s, there was an off-grid revival. But there was no daylight drive, everyone got suckered into big battery banks and inverters, and DC appliances were impossible to find.

That's all changed now. The reason we continue to use the power grid is because of habit, and maintaining the value of our "fixed investments." For ordinary Americans to transition to the lifestyle we have at LEF would be a big change. We are told over and over again what martyrs we are in enduring such "sacrifice." It's a rationalization for people so they don't have to think too hard about why they don't change their own lifestyle. So it goes.

The price of modern, grid-powered consumerism is immeasurable. Poorly insulated housing is the norm, and it all sells for a handsome price regardless of abysmal energy performance. That housing is only habitable given our willingness to extract massive amounts of coal and natural gas. And now the solar strip mines have arrived -- tens of thousands of acres of forest in our area being cut, stumps burned, land paved, to put up solar panel farms that *we do not need*. The deforestation rate in the Southeastern USA is five times faster than the Amazon rainforest.

It is clear that no amount of ideology or doomsaying -- no matter how justified -- is going to reverse these trends. But what if entire regions started shutting down their grid power and using DC Microgrids instead? DC Microgrids are not a magic bullet. They do not in themselves reverse ecological callousness or inequality, but they do a lot to make a locally empowered, sustainable communities possible. We are not expecting people in Jamaica to convert to solar for ideological reasons (necessarily). And the work itself feels rewarding. Even if Living Energy Solutions doesn't take off quickly, we will still be putting useful, durable solar powered equipment in the hands of working class Jamaicans. And the big prize is the possibility of this technology spreading. Buying a bunch of LED light bulbs and fans in China is very different than marching in the street and petitioning the powers that be. But the best (worst?) our American environmental movement is politically empowered to enact is electric cars (that 1% of humanity will ever be able to afford?) and solar strip mines. If regions in Jamaica and elsewhere cease to use grid power by choice, the movement will spread across the Global South, and then north from there. Then we shut down the global grid, the coal mines, the frack gas wells, and the nuke plants. We want to see DC Microgrids spread. The prize is huge if we win. Please help us if you can.

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 <https://www.youtube.com/watch?v=2wOxQ3sL9zc>
Batteries that Last (almost) Forever <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>