Living Energy Farm
July 2021 Newsletter

Alexis and Onyx have returned from Jamaica. Our trip was very productive. As an environmental activist, optimism is not something one comes by all that often. That said, it feels like we are in a position to have an impact on the course of human history. All indications are that we are going to be able to spread LEF's DC Microgrid in Jamaica. Things are also going well at LEF, with some excellent people moving forward with LEF's projects and goals at home.


Charlie helped us put on the solar panels at the breadfruit project.

DC Microgrids in Jamaica

For us, the most important question concerning Jamaica is whether or not people there want and need what we have to offer. The answer at this point is unambiguous. We were able to talk to a lot of people in Jamaica, and we did brief interviews on radio and television. The television interview is here: https://www.facebook.com/sourcefarmfoundation/videos/316413930224216 (Beware when you cut and paste the url, your device may add spaces.)

The response to our presentations in Jamaica was strong. We talked to farmers, small business people, larger commercial concerns, and lots of ordinary people. There is tremendous enthusiasm for DC Microgrids. The reasons are clear. Some people in Jamaica simply don't have electrical power. Energy billing is so volatile and expensive that sometimes people's electric bills go up even when their usage goes down. Many small businesses, urban and agricultural, are shut down because they do not have access to power or cannot afford it. Electricity in Jamaica is often stolen via illegal tapping of the lines. That tapping is dangerous. One of our work crew (who helped us install breadfruit processing equipment) had personally seen two people electrocuted. People are motivated to find better alternatives, but the only solar energy systems currently in Jamaica are large and expensive -- green trophies for rich people. Frankly, we were a bit overwhelmed at times with the amount of interest in our energy systems.

The second most important thing we need in Jamaica is a skilled crew on the ground. We now have a core team of seven people. Nicola at The Source Farm in Jamaica is an organizer second to none. She has been the spearhead of this effort. Other than her, we have a trained solar installer, a lineman for the power company, one person who has been the director of a sizable NGO in Jamaica, and a couple of people with extensive knowledge of business and law in Jamaica. The team is very, very enthusiastic with moving forward on this project, and has the talent to do it. We are forming an LLC in Jamaica that may be a for-profit concern or a not-for-profit. (In Jamaican parlance, a company that is "charitable" is the equivalent of an American 501-c-3, whereas "not for profit" is a separate, less restrictive category.) The company has been named Living Energy Solutions. It will have a Jamaican Board of Directors with a couple of us


Onyx and Charlie and the breadfruit processing equipment.

Americans in a support role.

The third thing we need is enough money. We have enough donations in hand to at least get started. We will outline the financial planning and options shortly. See **How You Can Get Involved** below (we are looking for help other than money as well).

We need a place in Jamaica to store materials and built solar kits. We have that space.

The impediments to moving forward are as follows:

Moving goods into Jamaica, and doing business in general, involves personal connections and sometimes bribery. Though there could be problems, we feel like we are in a good position with the social networks we have.

Farmer's Market, Hope Gardens, Kingston Jamaica. We had a demonstration tent with solar equipment. We were swamped with people all day long.

Materials sourcing for some materials is difficult in Jamaica. We intend to import sufficient materials, tools and spare parts to keep our production process operational.

The cost of the products we offer will always be a limitation. This has pressed almost all of the other people trying to provide solar lighting to low income communities to offer lots of cheap, short-lived solar junk. We are trying to connect people with durable equipment. We are going to have a diversified set of options at varying cost levels that should make the whole project more viable, and useful to the people who need it.

The only solar panels you see in Jamaica are big systems on the roofs of wealthy people.

Once the project becomes successful, we are going to get both positive responses and possible efforts at suppression. There are some wealthy people whose economic interest will be harmed by our efforts. That is at least some months, or perhaps a few years, in the future. A person can be stopped, an idea cannot. The plan is to propagate our ideas far and wide. That will make it hard for anyone to stop the spread of durable, decentralized energy systems.

The Breadfruit Project

The “breadfruit project” is an effort to set up a commercial scale facility in rural Jamaica that can process breadfruits and other agricultural products into store-able products (value-added, as they say) for consumption or sale. That project is about 20 minutes away from The Source Farm where we were based. Breadfruit flour is the headline product (made from the abundant local supply of breadfruit), but dried fruit, medicinal herbs, or other products are also possible. We converted/ built a DC powered shredder and grinder (for processing breadfruit) some months ago and shipped

them down. In Jamaica, we installed solar panels and made that equipment operational. We installed nickel iron batteries and turned on the lights. We also converted a small cane squeezer to DC power. (That will allow for the production of cane juice to sweeten various potential products.) The DC power system in place can power other equipment as well. We reviewed plans for larger food drying equipment and other potential future options. We have already demonstrated the new daylight-drive powered food processing facility to numerous people. The ability of farmers and other small business people to power equipment independently of a centralized grid is a game changer. Now it's there for people to see.

Jamaicans support themselves with "micro-enterprise" to the fullest possible extent.

Daylight Drive Consulting in Jamaica

The most important aspect of our DC Microrgrid is that it gets built in the context of an intelligently designed homes and businesses that minimize energy demand (as opposed to throwing gobs of energy at badly designed equipment and appliances, as happens with grid power). The second most important aspect of a DC Microgrid is that most (90% at LEF) of the energy does NOT go through a battery. We have trained folks in Jamaica about how that works, and they now have an operational example. Going forward, we are hoping to move DC motors, daylight drive refrigerators, daylight drive water pumps, and other equipment into Jamaica to empower people there to meet their needs without grid power. The Jamaican grid runs entirely on liquid fuel (diesel, basically), which is part of the reason grid power is costly and the price variable. Living Energy Solutions will be able to offer consulting and material support to individuals and companies to help them convert equipment to daylight drive.

The roads in eastern Jamaica are filled with potholes, cars, heavy gravel trucks, and pedestrians.

Living Energy Solutions, Phase I

Living Energy Solutions will offer several small solar-powered battery kits in Jamaica. We are probably going to get a small lithium set with *replaceable* batteries (so the whole kit doesn't get thrown away) to take the place of our smallest nickel-iron battery kits. This will give us an inexpensive, pre-manufactured kit to offer to the lowest income families. For nickel-iron battery kits, we are probably going to offer them in a couple of sizes. This will give us three sizes of kits for starters. These kits will cover a wide range of cost and

power options, from very low-cost kits that will run a few lights and charge a smart phone, up to a larger but still modestly priced kits that can support a household with lights, smart phone charging, computer charging, and running fans. We will also offer:

DC LED lights -- We have a good supplier, and quite a bit in stock that we will ship down.

DC Fans -- We have a supplier of good quality brushless DC fans for household use. In Jamaica it's hot, though generally less muggy, than in the southeastern U.S. A small electric fan is a lifesaver, and the ones we have a fairly cheap, durable, and very efficient.

Solar Panels -- The supply of solar panels in Jamaica is very limited. The only ones available are made for big solar systems put in by wealthier people. We are going to import some smaller panels suitable for our needs.

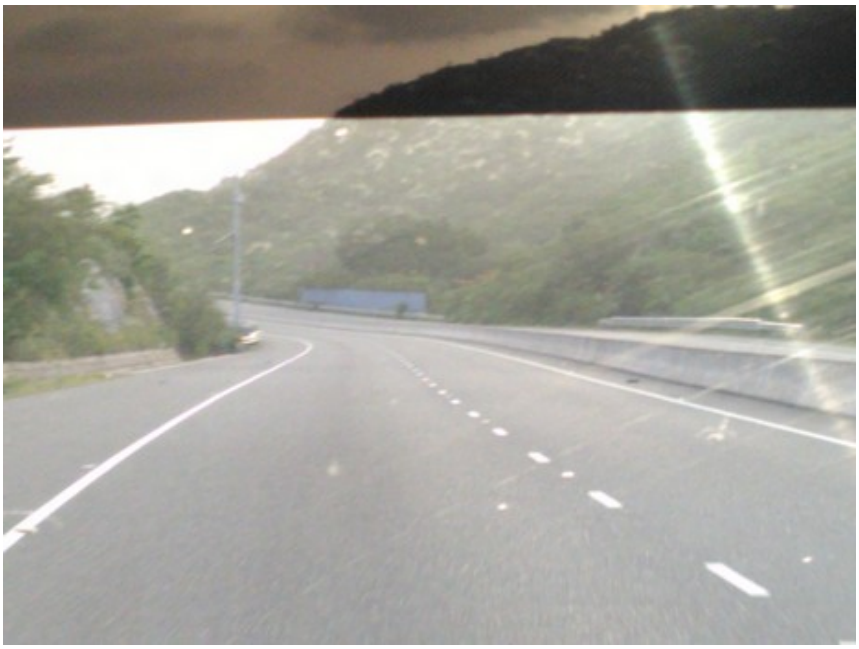
Cords, Splitters, Chargers, Support -- Basic attachments to move low voltage DC power around a home.

Living Energy Solutions, Phase II

As quickly as we are able (but not necessarily in this order), we are going to import DC motors to support people (farmers and business people) who want to convert to daylight drive, two different sizes (hopefully) of DC refrigerators, water pumps, and some (slightly) larger nickel iron batteries. We will also respond to what people tell us they need.

Solar Cooking in Jamaica

Insulated Solar Electric Cookers (ISECs, see previous newsletters) are the most effective solar cookers in the world, and they are not prohibitively difficult to build. We had previously send down 10 ISEC cookers. Prior workshops were conducted that showed people how to build and use them. The lessons we have learned so far are that while our simplest cookers (Perlite bucket cookers) are simple and cheap, there is a preference for larger cookers (like the Roxy cookers, see http://conev.org/ISECmanual14.pdf Also see http://sharedcurriculum.peteschwartz.net/solar-electric-cooking/) We built a demonstration Roxy in Jamaica and left if there for folks to use and assess it. We are now home and will be working on optimizing a Roxy cooker design that is easier to build and more appealing for cooks. The same metal working tools that are needed for making battery boxes for our nickel-iron battery kits can be used to make Roxy ISECs. We are setting up a metal shop in Jamaica with a shear and a brake (cutting and bending tools) that will allow for the efficient production of both battery boxes and high-quality solar electric cookers.



The roads in tourist Jamaica are a different story.

On The Ground in Jamaica

Our time in Jamaica was spent meeting with people, talking about our ideas and resources, installing commercial daylight-drive breadfruit processing equipment, and helping plan the installation of other solar equipment. We also visited the ocean, the forest, and some of the beautiful and sacred places of our Jamaican hosts.

There is a measure of culture-shock both going to Jamaica and coming back. The community life of Jamaicans is vibrant in the streets and neighborhoods on a daily basis. We were consistently treated well where ever we went. Every few hundred feet along every road there are fruit stands selling the food that grows so abundantly on trees in Jamaica. These tree foods certainly soften the hardships that come with a lack of money. There are also roadside stands selling everything from soap to shoe repair, and countless entertainment micro-bars offering music, food and entertainment. Good vegetarian food is easy to find (a matter of personal interest to me), owing in part to Rastafari and related social movements.

The heartbreak of Jamaica is that a lot of people have to try to survive with almost no money. Many people there have very little material wealth. We stayed in Saint John in eastern Jamaica. In that area, I did not see a single lawnmower or operational farm tractor. The endless supply of tools and toys one sees in the USA is absent. Even cardboard boxes are not plentiful, which is challenging to get one's head around. Apart from the universal machete (pronounced machet') carried and used by many Jamaicans, basic hand tools are hard to find. Tracking down the nuts and bolts we needed to put together solar equipment was tiresome. Because of the level of poverty in Jamaica, the security at hardware stores is extreme. Our first effort to get parts left us in a hardware store for two and a half ours to get less than $40 worth of nuts and bolts while we went through numerous security checks to make sure we didn't steal anything.

We built "Red Roxy" in Jamaica, placed here in an outdoor kitchen. At 300 watts, it will demonstrate a stronger cooker than our 100 watt Perl bucket cookers.

The roads in eastern Jamaica are absolutely horrible. (We also took a trip to the north coast to install a solar pump. The roads in the wealthier areas are smooth.) A lot of Jamaica is very steep, and small villages cling to hillsides all over. Jamaica has long been a plaything of capitalism, alternately exploited and ignored at the whim of profitability. Because Jamaica is so hilly, most agriculture is small scale. There are food bearing trees all over. It's hard to tell which are being harvested, and which are just wild or leftover from somebody's prior farming efforts. Modern capitalism prefers that everything happen on a large scale, that just doesn't suite the landscape of Jamaica. Most Jamaicans seem to enjoy their lives, but the lack of economic opportunity constricts what most Jamaicans can hope to accomplish with their lives. That is hard for young people especially I think.

I was shocked to realize that with rare exception, every Jamaica I spoke with had been to the United States and/ or had family and friends in the United States. There are more Jamaicans outside of Jamaica than inside. When native Jamaicans speak to each other in their native Patois, it's another language that I cannot understand. But all Jamaicans know how to speak English to Americans when the need arises. Jamaica to a

large extent seems to live in the shadow of the United States. Puerto Rico is similar I suppose. These islands are a reserve of labor (that migrates to and from the U.S. but never gets paid much) and a place to dump goods that cannot be sold in the U.S. They have no control over the corporations that seek to profit from the people and resources on the island. Every Jamaican I spoke with was cynical if not embittered by the corruption and dysfunction of their government and the social institutions that are supposed to make people's lives easier but don't.

We talked to farmers who can't grow food because they can't pump water, and young people who can't keep the lights on because they can' afford the bill. It feels like we really do have something to offer, and that is independent energy systems that last a long, long time. That can help can improve the self-determination of people, and they very much want that. DC Microgrids can clearly have a positive impact in Jamaica and beyond. It's not a magic bullet. It will not cure all the ills of inequality and environmental degradation, but it is a clear step in the right direction, and we are moving forward with it as fast as we can.

What You Can Do

We may come back soon and ask for money. But we don't want to ask for money simply to put it in the bank or to buy things we may need months or years from now. Right now, we are working hard re-configuring our battery boxes, sourcing materials, and making plans. We are also going to collect tools to send down. (No donations until we are ready to process them please!) The lack of basic tools in Jamaica is noticeable. There are a lot in the U.S. that don't get used much. We may seek investors in the future. With any new enterprise, one wants to be careful not to take on too much debt. In discussing options with our Jamaican friends, one option that came up is collateral-based lending. We can buy solar panels, for instance, at less than 50% of retail when we bring in even modest shipments directly from the manufacturers. If a supporter were willing to pay for the wholesale cost of said solar panels, we could offer them legal ownership of those panels. Either we sell them and repay the supporter. Or if things go awry, then the donor would have the right to reclaim the panels. Given that they could be fairly easily sold to cover costs, and perhaps even at a profit, the risk to the donor would be mitigated. We may pursue this strategy in both the U.S. and Jamaica. Naturally, it would be easier for a lender to reclaim material in their home country. If you might be interested in such an arrangement, let us know.

There is a lot of music in Jamaica. The Reggae backbeat is a common, if not universal, feature. The efforts at roadside commerce are endless.

Small Harvesters and Life on the Farm

This time of year and life is very good on the farm -- blueberry pancakes made of homegrown wheat and berries, cooked on biogas and solar electricity, all the melons you can eat. It's a good off-grid life we live.

We have two interns (Nike and Ellie) who are now focusing on building our small harvester prototype. That could have an impact all over the world. Jamaica imports most of its food. They used to grow rice, but given the expense of harvesting equipment, no farmer can make a living doing that now. The harvester might change all that.

We are moving forward with taking Magnolia (the house in the town of Louisa) off grid.

The kids are enjoying the summer, which has had a decent balance of rainfall. Our crops and our farm are doing well.

Addendum: What Are DC Microgrids and Why Are They So Important?

For those of you who might be new to our newsletters, the "DC Microgrid" that we have put together at LEF works as follows. LEF was designed to minimize energy demands, primarily by sharing resources and integrating our energy systems at a community level. We have well insulated community buildings. These factors reduce our energy needs dramatically. We have discovered that we can connect DC motors, including high-voltage industrial motors, directly to photovoltaic panels. As a result, ninety percent of our electricity never goes through a battery. We run the heating blowers for our buildings, grind all of our grain, and run a host of agricultural and machine shop equipment "daylight drive," meaning that we simply do that work when the sun is out. For lighting and electronics, we use nickel iron batteries (NiFes). Because of our daylight drive systems, our NiFes are about 1/10th the capacity you would expect to find in an off-grid house. NiFes are not cheap, but they are extremely durable and last for decades. The combination of daylight drive and NiFes constitutes our DC Microgrid, and it means we have access to most modern conveniences. The ongoing maintenance costs on a DC Microgrid are very, very small.

A DC Microgrid is easiest to construct at a community level, but some aspects of it are applicable to small households and low-income families. If we were able to get other people to use DC Microgrids far and wide, we could provide for the stationary (non-transportation) energy needs of people around the world without the use of coal, natural gas, nuclear, or centralized industrial "renewable" energy systems. DC Microgrids do require a change of lifesytle, but that change is neither extreme nor onerous. We live a good and comfortable life.

When we say we are in a position to affect the course of human history, that's not a joke.

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