

Living Energy Farm January 2023 Newsletter

Deb, Alexis, Rosa, Nika, and Deb's sister Carrie are in Puerto Rico. We have been here about a month. We have finished our first solar demonstration sites at Fundación Bucarabón in the mountains of western Puerto Rico and at El Departamento de la Comida (El Depa) near San Juan.

Fundación Bucarabón is housed in a large, concrete school building. They operate various programs supporting farmers and the community, including a commercial-scale community kitchen. Their building is well built, but the original utilities are in poor condition, and grid power is very expensive and unreliable in their area. They are off-grid.

In years past, Fundación Bucarabón received a few grants to install solar equipment. They installed two conventional battery-based solar electric systems. Those systems are on the large end of what you might find in an off-grid home. Even with a lot of battery power, they have been unable to pump water as they need, or to run their kitchen. The solar equipment that was installed before we arrived was well constructed, not cheap, and not small, but you can't just plug in a bunch of AC equipment into a solar kit and expect it to work. Unfortunately, a lot of the messaging in the popular media around environmental issues and solar suggests that solar can directly supplant fossil fuel systems. It just doesn't work that way. One normal refrigerator can be enough to drain most off-grid systems, even a sizable system such as they have at Bucarabón. To say that another way, a single refrigerator could cost you \$10,000 or \$15,000 in solar equipment if you simply focus on supplying energy instead of setting up efficient equipment. Sadly, not all solar suppliers are truthful about these basic facts.



Madeline, director of the food security program at Fundación Bucarabón, with Alexis and Debbie in their commercial kitchen. On the table are two solar cookers and a blender, all daylight drive.

Sourcing materials in the mountains of Puerto Rico has proven challenging. Try to find a pressure relief valve -- good luck! But we have persevered, and the systems we are building are solid. At Bucarabón, we built three solar electric circuits: one high voltage direct drive, one low voltage direct drive, and one low voltage with a battery. We installed a insulated solar electric cooker (ISEC), and a smaller Chinese made solar electric cooker, and left them with an operational, direct drive blender. We spoke with them about converting more of their appliances to direct drive.

We did a lot of work to upgrade Bucarabón's plumbing. We installed a multi-stage booster pump from Sun Pumps. (The Sun Pumps are very high quality, though a bit pricey. We did some work, and some testing, and found a similar Chinese made multi-stage pump of good quality, at 1/5th the price. So we are importing some of those.) The Sun pump is up and running, and providing them improved water service. We have installed one Sunstar refrigerator (which is very well insulated, and uses no batteries) at Bucarabón. The Sunstars are custom made for us by Sunstar (in Indiana) with a German Secop compressor. We are planning to return to Bucarabón later in the trip to tie up a few loose ends and conduct a workshop. The folks at Bucarabón are very enthusiastic about our technology. The irony in all this is that our equipment is both much cheaper and more effective.

El Departamento de la Comida (El Depa) is similar to Fundación Bucarabón in that they do lot of

educational work, and support the surrounding community in various ways. They also have a commercial kitchen. Like Bucarabón, El Depa has an existing off-grid system that, though quite robust, has no chance of running their kitchen. At El Depa we installed two high voltage circuits, one to power a couple of ISECs, and one to power their existing solar kit. We installed two Sunstar refrigerators, each on its own circuit. We also installed a nickel iron battery kit (with 55ah Ukrainian nickel iron batteries).

The mountains around Bucarabón are pretty idyllic in terms of climate. It's cool enough this time of year such that you want to wear a long sleeve shirt in the morning. But the temperatures are quite moderate. The views are beautiful and numerous. The small towns are charming beyond measure. Our interactions with the local folks have been universally positive. We are in San Juan now, closer to El Depa. The city life is certainly noisy and hectic, and the people less patient, than in the mountains. The only serious frustration we have had so far has been dealing with vehicles. Looking at two months of potential rental fees, we tried to buy a used truck that could be sold or donated when we left. That turned into a fiasco. We are making plans to borrow and rent some for the rest of the trip. We have been working pretty hard. Most of our equipment has yet to be installed/distributed.

International Electrical and Electronics Engineers Competition

As we mentioned in a previous newsletter, we advanced to the second round of the IEEE's Empower a Billion Lives competition. Their national conference is in mid March in Orlando. And we are going through Orlando on the way home. How convenient is that? They are paying expenses for our main presenter to attend and speak. There will be thousands of folks there, including people who have undertaken projects much larger than ours. We have already been exchanging thoughts and ideas with some of them. This event may significantly increase exposure for our technology.

Our demonstration sites in Puerto Rico will serve as our "field test" for the competition. The competition is focused primarily on very low income people in other parts of the world. That said, energy doesn't get any cheaper than our "daylight drive" DC Microgrid. At this point, we are early in the setup stages of putting things together in Puerto Rico. We have benefited from talking to people who have undertaken large projects in other parts of the world distributing solar equipment for low income people. For us, there are a lot of questions to answer yet as regards "business plans" or an ongoing nonprofit campaign. Certainly many people, both private individuals and organizations, are very enthusiastic about what we have to offer.



Alexis and the Bucarabón staff surveying solar panels on the roof.

Wood Rats vs. Biogas

Back home at LEF, Brenda, John and Otto are holding down the fort along with a few new folks. Alexis noticed as we were leaving Virginia that something had gone wrong with our new, large biogas digester Seymost, but he didn't have time to fix it. Seymost is a 2000 gallon tank with solar thermal heating and two layers of straw bales wrapped around it. A biogas digester with auxiliary heat, it turns out, is a very nice winter habitat for wood rats. Oh darn. Some of the biogas plumbing is plastic, and the rats have been chewing up the

plastic pipe. So now, thanks to John and Otto, a lot of straw has been removed, pipes repaired and rat-proofed. Hopefully these lessons will put us in a better position to help others build biogas systems with less trial and error. Support us if you can.



Debbie, four daylight drive solar fridges, a pile of solar panels and other solar equipment, and one very unreliable truck.



El Depa staff with their new Insulated Solar Electric Cookers.



Nika finds a baby dinosaur (aka iguana) in San Juan.



We were lucky to be able to hang out with a manatee near the edge of the water in a bay in San Juan. They are endangered.



Carrie and Alexis mounting solar panels on the roof at El Depa.

*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 Institute are tax deductible. **To make tax deductible donations, do not go to the Virginia Organizing website, go here instead: <https://donatenow.networkforgood.org/1388125>** Make sure to designate your donation for Living Energy Institute (formerly the Living Energy Education Fund).*

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>