

## Living Energy Farm

### January - February 2019 Newsletter

#### Still time to register for:

**Organic Farming, Orchard and Food Self-Sufficiency Immersive** March 15 – 17, at LEF, 1022 Bibb Store Rd, Louisa VA. Come and stay at LEF for the weekend, learn about off-grid living and food self-sufficiency. On Saturday, we will do a brief tour of LEF's energy systems. We will spend the rest of the day discussing how to plan and grow organic gardens. We will look at both home scale food production and food preservation, as well as larger scale organic and regenerative farming and seed saving. We will discuss the importance of and options for organic no-till agriculture. Sunday will be devoted to growing food on trees. In the morning, we will discuss orchard planning. In the afternoon, we will discuss tree propagation, including growing from seed, rooting, and grafting. Each participant will graft 5 pear trees (all materials provided) to take home. You can come for a day (\$75) on Saturday or Sunday, or you can come for the whole weekend (\$150). Food and boarding will be provided (you will stay with us in our main house at LEF). You will have to walk about a half mile to participate in this workshop. RSVP to livingenergyfarm at gmail. You can also get more information by calling 540-205-9815.

#### Living Energy Lighting and Charging Systems

As you may have noticed, we sent out an announcement about the release of our Living Energy Lighting and Charging Systems. There is quite an interest in these systems. If you didn't see the announcement, the description of the systems is at <http://livingenergyfarm.org/wp-content/uploads/2019/03/LELCS6.pdf> We are very excited about offering better off grid lighting/ electrical systems. We have a plan to take these lighting systems to folks who need them at the Navajo Nation in Arizona. But we are still working on the details, so we can't say too much about that yet. We also have arrangements to bring in more nickel-iron batteries from two different Chinese battery companies, including some that are quite a bit cheaper than what we have been buying. If this all works out (if the quality of the new imports is good), then we will be able to offer a wide range of solar electric systems, from very small to larger than we have at LEF, at lower prices. Our immediate goal is to both provide basic services to people who do not have grid power and cannot afford fancy (and badly built) conventional off-grid systems, as well as convincing ordinary folks that off-grid living is a desirable option. Decent batteries are a critical part of that. We are also continuing work on homemade nickel-iron batteries. Our larger goal is a movement toward sustainable, community self-determination.



*A friend of ours wanted to help us improve the social hang-out spaces at LEF, so they donated us the material to build the Sunset Porch off our kitchen, which will be a great outdoor space for eating and socializing.*

## Roughing it “Off Grid”

Dear friend and avid pianist Brenda has taken up residence at LEF these days. She found a baby grand piano for free. The family who owned the piano has had it for generations. They just wanted to see someone take it who could play it. Now our evenings are enlivened by the lovely music made by Deb and Brenda. We enjoy our off-grid lifestyle.

## Cooking Without Fossil Fuel

While our DC microgrid at LEF as exceeded our expectations, cooking without fossil fuel has been more challenging. We put together a biogas system in the early days. We were daunted by how much inputs were required, and by how little gas we got out of our system. We had a 50 gallon drum digester. It was summer then, so the digester stayed pretty warm (that matters a lot). We fed it (almost) every day, and still only got enough gas to cook a meal about once every two weeks.

Seeing the limitations of that system, and noticing how well our other solar electric and thermal systems work, we have put quite a bit of time and money into trying to develop a solar high-temperature storage system for cooking. We knew this would not be easy. Thermal conduction goes up geometrically with temperature. As a solar collector gets hotter, it gets very difficult to control losses. Our solar thermal systems for heating the buildings work well when the collectors are only modestly warm (100 degrees F or so), and a hot shower in winter only needs to be 120 F or so. The much higher temperatures needed for cooking (250 degrees F or more) are much more difficult to harness. The big industrial systems use evacuated (vacuum) tubes. They report efficiencies over 70%, but those systems are not cheap. We have completed several prototypes, including our most recent that uses a much cheaper borosilicate tube instead of a vacuum tube. We have tested it some, and it does heat up a pot 50 feet away from the collector on a sunny day (using a steam jacketed kettle with mineral oil as a heat transfer medium). We are not done testing yet. Perhaps this system will work in warmer, sunnier weather. We have had very little sun for the last 9 months. Is that because of climate change? Who knows. But we do know that it looks less and less likely we can make a high temperature solar system work. We will test it more, but we are moving on toward other plans at this point.

Mostly these days we cook on rocket stoves, but they are messy, dangerous, inconvenient, and unhealthy (from the smoke and ash). We have examined plans for “smokeless” wood stoves and what not, but those are mostly wishful thinking. Trying to burn wood without smoke is not easy. A lot of cooking is done around the world on charcoal, but the charcoal process sacrifices 70% or more of the heat content of the wood. After looking closely at all of these considerations, we are turning back to biogas.



*Piano lessons on our "new" baby grand piano with Naftali, Zaire, and Nika.*



*The indoor part of the solar high temperature cooking system, a steam jacketed kettle and a DC pump. It gets hot, but not hot enough.*

It is a relatively simple and well-known technology. We have started assembling the parts. Biogas needs a carbon-nitrogen balanced fuel source. We are making a small, solar-powered wood grinder to make coarse sawdust. The sawdust will provide the carbon. We will use human waste for the nitrogen. We can also put all our food scraps in the digester. We will also use a solar hot water panel to keep the digester warm. Optimum temperature is about 98 F, which is well above average ambient temperature around here. Then the effluent is fertilizer. We have a lot of the materials in hand, and have begun setting up a digester. We are hoping with better design and management, our gas production can be considerably increased from our earlier design. As with all of our projects, we are mindful of how to make a cooking system that other people less privileged than ourselves can actually afford.

## Farm Report

Early in the winter, we noticed a number of our friends coughing and getting various winter illnesses. We smugly mentioned that, among other benefits, solar heated buildings are much healthier to live in. The graceful warming cycle keeps humidity levels higher, indoor air quality is much better, and daylight is always a good thing. Well, after being fairly illness-free early in the winter, LEF has had a difficult February. We got hit pretty hard by colds, flu, and even pneumonia. Yuck. Thankfully, everyone is on the mend now.

We are planning for our farm season next year. In rounding up financial accounting for last year, we realized that our food self-sufficiency has some big financial advantages. Our food bill last year was very low compared to previous years. This year, it should be even better. We are growing almost all of our own grains, and even eating homegrown peanut butter! We don't want to try to grow *everything* we eat, especially not those foods that we can get from local non-corporate sources. But we are likely to grow and process even more staple crops than last year. We will probably keep seeds production at a modest level, earning most of our income that way, but hopefully not working ourselves into the ground either. Fruit production should be quite a bit higher than last year as our trees, particularly the persimmons, mature. They are a great food source for us. We continue to work on our "farm grown fuel" program, trying to figure out how to fuel small tractors with fuel we grow, but the cooking system is a higher priority right now.



*LEF's biogas unit from about 5 years ago. Gas production was meager, but we were new to the technology. We are focused on making a better biogas system now.*

*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](http://www.livingenergyfarm.org), or contact us at [livingenergyfarm@gmail.com](mailto: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 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>

First video on youtube

<https://www.youtube.com/watch?v=ppTBO8d6jhY>

Second video on youtube

[https://www.youtube.com/watch?v=wdSX\\_TIYkD4](https://www.youtube.com/watch?v=wdSX_TIYkD4)

Video on vimeo

<https://vimeo.com/128744981>

Slideshow produced by Alexis a while ago

[https://www.youtube.com/watch?v=4x\\_C3iScoAw](https://www.youtube.com/watch?v=4x_C3iScoAw)