

# Living Energy Farm

## January - February 2018 Newsletter

### Upcoming Workshops

Please RSVP [livingenergyfarm@gmail.com](mailto:livingenergyfarm@gmail.com) if you plan to attend.

### Living Energy Farm Immersive Weekend, Learn how to Live Without Fossil Fuel, and How to Feed Yourself!

Our First Weekend Immersive in January went very well. (See below.) Our **second weekend immersive will be the weekend of March 23 - 26, and is focused on food self-sufficiency**. Come live with us for a weekend at LEF, eat healthy, homegrown food, and learn how to grow your own food, in the fields, and on trees. Weekend will include orchard planning and tree propagation (see below). See the schedule for the weekend at <http://livingenergyfarm.org/workshops/2018/march2018schedule.pdf> This event at LEF, 1022 Bibb Store Rd., Louisa VA, 23093  
RSVP [briennagerard@gmail.com](mailto:briennagerard@gmail.com) Cost is \$150, limited worktrades available.

We will have two **Fruit Tree Propagation Workshops** this year, one on March 25, during our immersive. You can come for the whole weekend intensive (\$150), or on Sunday March 25 (orchard planning in the morning, propagation and grafting in the afternoon, \$50 half day, \$75 whole day). We will teach you how to select and plant the best, most productive, naturally disease resistant fruit and nut trees. We will teach you how to propagate ALL fruiting plants, using methods including growing from seed, layering, rooting cuttings, and numerous forms of grafting adapted to all species of fruiting plants. Each participant will take home 5 pear trees that they graft themselves. We have collected scions (grafting wood) from about a dozen of the best disease resistant pear varieties, and these will be available. Limited quantities of persimmon and jujube rootstock also available.

**Our second propagation workshop is planned for May 5**, and will focus on field grafting. The most amazing growth rates from grafted trees can be obtained by grafting plants that are already in the ground. This is done by either planting your own rootstock, or finding wild compatible trees in suitable locations, and converting them to food producing trees. We will start the program by teaching you how to select and plant the best, most productive, naturally disease resistant fruit and nut trees. We will teach you how to propagate ALL fruiting plants, using methods including growing from seed, layering, rooting cuttings, and numerous forms of grafting adapted to all species of fruiting plants.

### First Immersive Weekend is a Big Success!

Our first off-grid immersive weekend happened in January and was focused on energy systems. We wanted to show folks how comfortable it can be to live with only solar energy, even in January! We had a full house of participants, and it went very well. We ate tasty homegrown meals, had a bonfire and a singing circle, and (hopefully) learned a lot too. Alexis led several workshops on DC electrical systems and participants got hands-on experience wiring solar panels to batteries and motors.



*Weekend immersion participants set up a model DC daylight drive system.*

## **LEF is Doing a Webinar Series**

Alexis recently did an interview with the The Institute of Ecolonomics. They have websites at <http://nourishtheplanet.com/> and (where the interview is) at <https://www.eatcommunity.com/products/eat-free-community/categories/153602/posts/1787994> You may have to pay them something to see the webinar (?)

## **Consider Donating a Macbook?**

The computers we use at LEF are small, old machines running linux. That webinar software, try as we might, does not work on these machines. We borrowed a Mac to do that first one. They want us to do a whole series. If anyone has a Mac computer that they would consider donating or giving us on long term (2 months or so) loan, that would be great. Thanks!

## **Interested in Putting a DC Microgrid In Your Own Home?**

Ever since we started LEF, people have expressed interest in adopting some of our techniques in their own homes. That is a complicated issue for us. We want to teach people, but renewable energy and grid power don't always play well together. For example, solar hot water systems are often used to pre-feed electric or gas water heaters, and often abandoned when they suffer some glitch (because the hot water output remains the same either way). But teaching people how to build our LEF style self-sufficient DC microgrids could have some benefits as well. It is certainly a better technology than bulldozing thousands of acres to build industrial solar farms (as is happening all around us). If you are interested in putting some DC equipment in your own home, you could come to our next energy-focused immersive. You could also let us know you are interested, email living energy farm at gmail (see our website). We are considering approaching local solar installation contractors and teaching them how to do what we do. If we can tell them some people are interested, then they will be interested. Drop us a line!

Costs (materials only) of some pieces of what we are doing are as follows:

- 1) Solar charging station for charging smart phones, laptops, and any other device than can be charged from an automotive-style car charger, \$150
- 2) Small Nickel-Iron (NiFe) DC lighting system suitable for a cabin or very small house, \$250. Operates as a 10ah, 12V system. You can use the 12V power for other purposes.
- 3) Large Nickel-Iron (NiFe) DC lighting system suitable large house, \$1500. Operates as a 100ah, 12V system.
- 4) Daylight drive system, scalable, 90 - 180V, wattage variable, can power motors, probably more useful on a farm or in a community, \$1000 - \$2000.
- 5) Daylight drive Sundanzer refrigerator, as in independent system (\$1600) or tied to a pre-existing grid-tie PV system, (\$1400).
- 6) Independent water system, DC pump, tied to daylight drive system (\$2500), or from a pre-existing grid-tie PV system, (\$2500), or built from scratch (\$3000 - \$4000).
- 7) Strawbale insulation retrofit consultation, and solar hot water, site specific.

That's a few options. Let us know if you would like to pursue one or more of these options.

## **We Have Put Together Some Documents That Explain What We Are Doing**

The master document list is at <http://livingenergyfarm.org/techdocs/techdoclist2.pdf>

A cost-benefit analysis of LEF versus other off-grid systems is at

<http://livingenergyfarm.org/techdocs/lefcostbenefit2.pdf> Comments (including constructive criticism) welcome.

## LEF Update

Things are going well at LEF. Misha, Deanna, Sunnelin and Olan have moved to Richmond. We were sad to see them go, but they have been back visiting and intend to remain involved in the project. Meanwhile, we have been joined by Faith and her kids, Rhyzley and Taozen. The new kids on the block play well with Nika and Rosa, so our daily life is good. We are getting ready for the coming growing season, and expanding the orchards around our house. We are continuing work on a number of projects, including high temperature solar storage for cooking, and farm traction. Our second generation solar cooking system is going to use hot oil and rock as a storage medium. That should be operational at a prototype level soon. We are working on converting our small tractors to low-rpm engines suitable for woodgas and/ or turpentine. We have realized that the older, lower speed engines will probably work better than more modern ones for this purpose.



*EarthHeart, our main house, with the ground settled now we are planting an orchard around the house.*



*Homemade nickel iron batteries, but they don't hold power very well (yet).*

## Homemade Nickel Iron Batteries

Eddie spent a couple weeks with us in January. He brought his homemade Nickel Iron batteries along with him. While it is rewarding to be making progress on this important project, it is also clear that we have a ways to go yet. The homemade NiFes don't hold a charge very well. We have some old Russian-made NiFes. We dissected one of those with Eddie. Looking at the insides of that battery was surprising. The Russian NiFe has 5 perforated plates, spaced apart with plastic spacers. The design is clearly not all that complex. The Russian NiFe plates are filled with black gunk, or at least that's what it looks like. After further research, we have realized that the "gunk" is particulate metal. It appears that we have been following the lead of others in focusing on textured plates, when the design of

commercial NiFes uses particulate metal to achieve high surface area. In discussing this effort with people who have worked in commercial battery facilities, we have been told that the purity of ingredients can make or break a battery. With these insights, we are (hopefully) on track to make functional, homemade NiFes. The dream of

homemade, or village-made, NiFes has been around a while. There have been some university research projects conducted in pursuit of that goal. It's not clear what those efforts achieved. Can we take the torch further than they did? We hope so.

In the meantime, we have been trying to get our hands on smaller size NiFe sets for use in small homes or villages in non-industrial countries. The only NiFes we have been able to get in the U.S. are 100 AH sets that cost \$1,000. That's a high price for a minimalist lighting setup. We went straight to the Chinese manufacturer, and have secured a shipment of 100 AH NiFes into the U.S. This will allow us to build and test very small NiFe sets in the \$50 - \$250 price range. These small lighting sets would have a small photovoltaic panel, a battery, lights, and that's all. We are fairly confident we can run them without any electronics, which would be different from all other charging/ lighting system we know of intended for village use. It is the mix of the very old (NiFes) with the very new (DC LEDs) that makes this work. These lighting systems should last for decades.

To our knowledge, all of the other well-intentioned but not technically informed efforts to set up lighting systems in non-industrial countries have relied on variations of lead-acid batteries. Those are awful. The modern lithium batteries are perhaps better, but they die in 10 years. For sustainability, the NiFes are by far the best. The NiFes got pushed off the market because they are bulky. But if you have been paying \$30 a month out of a \$150/ month paycheck to run a smoky kerosene lantern (as is common in sub-Saharan Africa), who cares if your batteries are a bit large? As long as they work, and keep working. That's what NiFes do best.



*New daylight drive solar fridge, kids (L to R), Rhyzley, Nika, Rosa, Taozen*

### **LEF Gets a Refrigerator!**

We have been living without a fridge for 7 years now, and gotten quite used to life without one. But we want to build a model that others will want to replicate, and most Americans think of a fridge as indispensable.

So we looked into our options. There is a solar thermal ammonia loop icemaker designed for off grid applications- search for ISAAC or STEVEN icemaker. It is a clever, elegant design, but we would have to build it ourselves, and we are not sure when we will be able to do that. So we went ahead and purchased a Sundanzer DDR165 "direct drive" refrigerator. It runs at 10 - 45 volts DC, which means it can run during the day straight off the solar panels. It has 6 inches (!) of insulation. It's about one-third as big as a big fridge, not bad. The idea is that you chill it down, and it stays cold. Make sure you keep the thing pretty full, so the manual says. What the manual does not say is what the heck you do when, like us, you go through two months with almost no sun. Our electrical systems are just fine. The lights are bright, the internet is cruising, the shower is still hot, but the fridge is not cold. Dang.

Head scratching time. So much of figuring out how to make things work comes down to terminology. After about 8 hours (solar powered) internet searching time, we find "switching power supply." Takes high voltage DC down to 24 V DC. That will allow us to run the fridge off our big 180V daylight drive rack, which will have enough power even on cloudy days. It cost \$51. We just installed it yesterday. Results in the next newsletter.....

### **Spreading the LEF Model**

The multi-linear DC economy we have built at LEF will spread, but it really should happen sooner rather than later. We continue to try to talk to other organizations about our model. We have been meeting with the folks at the New Community project in Harrisonburg. That effort is moving forward, and has helped us focus on an incrementalist approach. We have found some folks in Nicaragua who want to build a ecological demonstration site, and have some ideas about how we can apply LEF technologies to communities in Nicaragua. Eddie is headed down there in March to assess the situation. Nicaragua is the second poorest country in the western hemisphere, so it may be an opportunity for us to help low-income communities. We have had some conversation with Native American environmental groups, but not with any concrete results yet. We keep working on it.

Please support us if you can.

Articles and videos about LEF:

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)

*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.*