

Living Energy Farm

September - October 2016 Newsletter

Finishing EarthHeart, Our Main House

We are finishing our off-grid house, EarthHeart. The strawbale is all done. The building is fully insulated, the stucco is done, the drywall is hung. We are finishing up the tiling and painting. Our solar hot water system is working well. The solar heating system for the house is also fully operational.

Our building philosophy is to keep the frills to a minimum and invest our time and money on making sure our buildings and systems work well. To that end, our walls are 18 inches thick. We have “R-50” insulation in the attic, which is more than most buildings. Simplicity of design also helps a building function well, and keeps the cost down. We have avoided vaulted ceilings, clearstories, or skylights as such features tend to be both expensive and leaky. The results are clear already. Though we have seen temperatures as low as 28 F, we have not needed to run our solar heating blowers. (Now that we are painting, we are running the blowers so we can keep the doors open *and* keep the house warm.) The combination of good insulation and passive solar keep the house in the upper 60s F at night without added heat. The solar hot water is toasty warm, even after several cloudy days.



Our New Shower

For various reasons, we decided to put the first house at LEF well off the main road. Now we hear coyotes and owls as much the distant sound of traffic. But we are also inaccessible for fire trucks during part of the winter. Thus we have installed some simple fire fighting equipment in case there is trouble in paradise on a muddy winter day. For now we have a small gas pump tied to a water storage tank, though we will likely install something more reliable in the long run. Even as we scale down industrial society, by choice or as we are forced to, one hopes we can power emergency services with liquid fuel. Nothing compares to liquid fuels for fast and mobile power output. No wonder they are so addictive....

Nickel-Iron Battery Testing

There are two particular technologies we have deployed at LEF that we feel like would be useful in villages around the world. One is our direct-drive DC economy, and the second is our Nickel-Iron (NiFe) lighting system. A few years ago, we purchased a set of NiFe batteries and set them up

running a few lights in one of our agricultural buildings. The NiFe set we have is rated at 100 amp-hours. Simple translation is about the same as a single car battery, though functionally they are very different. Most off-grid houses have much larger battery sets, often 1000 amp-hours or more.

For construction, we have been running power tools off of a couple of lead-acid batteries tied to an inverter. While it is possible to build a house without a circular saw or other power tools, we decided to use a standard lead-acid batteries for a few years in order to expedite construction. We have been using the same lead-acid batteries for temporary lighting in our kitchen (which is separate from the main house) until we could get the Nifes installed. It has been interesting to watch the lead-acids decline. Over the course of a few short years, the lead-acids have lost a significant amount of charge capacity. In extended cloudy periods, the voltage on lead-acids drops into the range where the batteries themselves start to degrade.

Since we swapped over to the NiFes, the difference is significant. The voltage on the NiFes has been remaining high, and the lights have remained bright, right through two week-long cloudy periods. The voltage on the NiFe 12V set has remained above 13.2V, which is to say we have not yet touched their full usable capacity. With normal off-grid systems, the inverters shut down at 11.5V, at which point the user is literally left in the dark. We can pull the NiFes down as far as we want without damaging them, if we ever need to.

In thinking about taking LEF abroad to villages around the world, we realized that many people in non-industrial areas are dependent on cell phones. In order to test our NiFe system, we tied an automotive cigarette lighter into our 12 volt system to plug in a cell phone charger. We have been charging as many cell phones as we and our interns need, and the system has shown not flagged for power. Right now, the panels charging the NiFes are 200 watts. (Most residential grid-tie systems these days are 5 - 10 KW, or 25 to 50 times larger.) Solar panels are environmentally costly to build, so being able to use a lot less of them is significant.

We tell people when they come to LEF that the primary “technology” that makes our renewable energy economy work is cooperation. Our community is organized to maximize efficiency. We minimize the need for stored electricity by sharing the use of the tools and facilities we have, and by storing energy in forms other than electricity. The huge battery sets in ordinary off-grid houses last 5 years or so and cost

thousands of dollars to replace. These big battery sets are used to power large, two-stage inverter systems to generate 120V and 240V sine wave power so people can run well pumps, refrigerators, laptops, etc off of their off-grid power source. After some years, people realize that the cost of the replacement batteries alone exceeds the cost of grid power. (Notwithstanding the hidden environmental cost of grid power.)



Alexis and Our New Grinder

At LEF, we store heat in the dirt under the floor, so we don't need to run a heating system at night. We have slightly larger water storage tanks so we don't have to run a well pump at night. We store electricity ONLY to light up DC LEDs, which are super-efficient. And now we are charging cell phones and personal devices. We intend to grow our own entertainment at LEF, rather than watching screens. But for the sake of our outreach program that seeks to help villages around the world become energy self-sufficient, we want to know if we can support such use with NiFes.

The fact that an entire community of people at LEF can easily have all the lighting they need (and charge their phones) with the storage capacity of a single car battery speaks to the efficiency of this design. Each bedroom at LEF has two overhead lights. With a 3 watt DC LED in each socket, we can light a room well enough to read fine print with 6 watts. In the coming months, we will test the NiFe batteries more thoroughly. We have also acquired some small, used NiFe batteries for further testing. (They might be suitable for a household, but cheaper than the set we have.) NiFe batteries are nontoxic, nonexplosive, and can be made in a modestly scaled factory. To our knowledge, they are the only battery ever developed that does not degrade with each charge cycle. As we look to spreading the LEF model to other parts of the world, we are looking into what it would take to set up NiFe production in other parts of the non-industrial world.

Enjoying the Harvest

As is true every year on a diversified farm, we had some bumper crops and some crop failures this year. Most of our seed crops produced well. We had a bumper crop of Tahitian Melon winter squash. We also produced a fantastic crop of Florianni Red Flint corn. After lusting over various grain grinders for years, we finally bit the bullet and invested in a good mill. The one we have is called a Grainmaker. It is small enough to run by hand, but large enough to be turned by a motor (driven by direct drive solar power, in our case, no batteries necessary!). The grinder could support the food needs of a sizable village, or allow us to sell specialty grain meal. In the meantime, we have been grinding our corn, as well as wheat, oats, and other grains. The flavor of the grits, bread, flat breads, and cereals we have been making is phenomenal.

Last spring was harsh, and included a devastating late freeze that wiped out most of the fruit. But, we have lots of persimmons, as they are among the most resilient of all fruiting trees. Many of our meals these days at LEF are dominated by home-grown ingredients. Another important aspect of reclaiming local power is gaining control over our health. Corporate food undermines the global environment, the future of democracy, and the health of your own body. The leading causes of death and disease in the U.S. are all related to poor food and the extensive marketing of addictive and unhealthy foods. We are proud to be planting the seeds of good food!

LEGI Update

We recently started looking abroad for opportunities to help villages become energy self-sufficient through our Living Energy Global Initiative. The NiFe testing has been helpful. We do not currently have the resources on the ground to move much further in Bindura Kenya, but we have been in dialogue with various individuals and organizations about where to go next. We will keep you posted as this process evolves.



Connector Between Kitchen and House, Last of the Carpentry....

Woodgas (Finally!)

We put an ad in our last newsletter about needing a technical intern. We're very happy that Eddie answered the call, and he's been hard at work putting together our wood gasifier. Hopefully we will have the tractor running on woodgas by the next newsletter. Thanks Eddie!

Got Paint?

We need paint. If you live in Louisa, Charlottesville, or Richmond, and you have more than a couple gallons of latex paint that are in decent shape, please consider a donation to your friends on the farm....

Choices

For anyone who cares about the natural world, the long term well-being of humanity, and the other creatures with whom we share this sacred creation called Earth, this is a difficult time in which to live. We are lost in bubble of our own creation, where trivialities dominate the public mind and the face of God has been painted over by an advertisement for automobiles. I have spent my life trying to understand why humans make such poor collective choices. For all that effort, it is clear that intellectual analysis is powerless to break the spell.

The expansion of the industrial economy is destroying the living world. The solutions to that crisis are, at a material level, fairly simple and straightforward. There are three simple principles. The first is that we need to cooperate in the use of resources, because renewable energy works on a village level. Villages can be sustainable. Cities and suburbs are not. The second principle is that we must practice



Eddie and the Gasifier



We found a playhouse someone else was giving away....

some degree of modesty. That sounds like a tall order in an age of such grand immodesty, but it isn't really. We do as we believe we are supposed to. We adopt the cultural norms of our society. If modest behavior were a norm, then that's what we would do. We create norms by working together, not alone. The third principle is that we have to accept that the Earth itself, the living creation we inherited, is sacred. For some political reasons a long time ago, someone decided that spirituality and science had to be separate things. They need not be. We can, if we choose, seek scientific understanding with a ravenous appetite. And at the same time accept that we as humans need to hold faith in higher purpose.

The Age of Reason never began. The elite grabbed the education system and made it a means of justifying their economic and political domination of our society. We look down our noses at the conservatives who deny evolution. But humans are more driven by culture than genes, and we are all equally complicit in our denial of cultural evolution. If we understood the principles of human cultural evolution, we would understand that human society is built from the ground up. As painful as the political charade of our time may be, it is just that ; a show to distract us from reality. Building an economy in which people live sustainably, own their means of livelihood, and respect the sacred Earth would be simple indeed if only we could muster the faith to work together and do so. But we have to give up the narcissism, personally and politically. We have to understand ourselves, remove education from the ivy cathedral and spread it in the streets. We have to have faith sacred Earth and our capacity to defend it.

Links for Media Articles About LEF

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

Video on vimeo

<https://vimeo.com/128744981>

Slideshow produced by Alexis a while ago

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, or contact us at livingenergyfarm@gmail.com. Donations to the Living Energy Farm Education Fund are tax deductible.