

Living Energy Farm
July - August 2025 Newsletter

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*** *Don't miss this one* -- About documenting the advantages and expanding the reach of direct drive solar energy systems that are not dependent batteries or fossil fuel backup.

Living Energy Farm's 15th Anniversary Celebration November 15

Come to LEF and celebrate our 15th anniversary! We will start around 2 PM. We will provide some food, but feel free to bring your favorite party snacks, as well as musical instruments. We are trying to fix up our road, but in the short term that means disturbed dirt and no vehicle access. You will have to walk a half mile in and back out. (In the future the road will be much better...) Address is **1022 Bibb Store Road, Louisa VA, 23093**. Beware that GPS often sends people to our neighbor's house. We will have a bright flashing yellow light next to our driveway that afternoon.

DC Solar Training at Serenity Solidarity in New York



Installing solar panels at Serenity Solidarity.

This summer, our fourth annual DC Solar Training took place at Serenity Community in upstate New York. One of the co-founders of Serenity, Ericka Williams Rodriguez, is a long time supporter of our work, particularly our project in Puerto Rico. (She's also an amazing activist and organizer.) We were very pleased to combine our educational program with the installation of a solar fridge and lighting/charging system for Ericka's new community, Serenity.

This event brought together a dozen amazing people from throughout the northeast, including activists, community organizers, builders and electricians. It's clear that there's a lot of enthusiasm for building decentralized, community controlled renewable energy systems in the northeast. Before the installation, Debbie and Tim did a tour of potential future DC Microgrid sites in Vermont, mostly centered around Marshfield, home of Cooperation Vermont. Their mission is to build economic and environmental democracy in the face of increasing climate disasters and economic chaos. They already served their community once as a resilience hub during the devastating flooding that happened in northern Vermont in 2023. They are interested in setting up more microgrids to increase community energy sovereignty, with our help.

To this end John will be traveling to Marshfield at the end of September to give a workshop on DC Microgrids during their Harvest Festival, while installing a solar direct fridge to support food distribution at their local library. (Solar direct fridges are highly durable refrigerators that use thermal storage instead of batteries. Refrigerators in the U.S. use more energy than all of our farm machinery. Solar direct fridges solve a big environmental problem.) After he leaves, a local crew will install a second solar direct fridge at one of the cooperative businesses in Marshfield managed by Cooperation Vermont.

Local knowledge is growing about DC Microgrids as a result of our trainings. We're pleased to continue offering these programs in future years. For our 2026 training(s), we're talking to potential hosts in Richmond VA and western NC. Keep an eye on our newsletter and websites for more information.



Deb, Ericka, and an Iron Sun nickel iron battery kit at Serenity Solidarity.

Living Energy Lights at the Resilience Fest in North Carolina



John teaching about direct drive solar at the Resiliency Festival in North Carolina

The Footprint Project is a non-profit that deploys renewable energy systems for disaster response throughout the US and Puerto Rico. John and Debbie first crossed paths with this impressive organization last winter in Caguas, Puerto Rico, where Living Energy Lights (the outreach arm of LEF) and the Footprint Project were working on separate solar projects a few blocks apart! This summer, we were pleased to participate in a conference organized by the Footprint Project in western NC called the Resilience Fest. This event brought together dozens of organizations working at the intersection of sustainable technology, disaster response, and resilience. While the DC Microgrid is not exactly the sort of

portable, quick-to-deploy technology that's typically useful for disaster response, we have a lot to offer in the realms of long-term resilience and disaster preparedness, which are both critically important to the majority of the people and organizations at the conference. At the event, John and Lucy gave a presentation on direct drive which included a live demonstration of a little Microgrid powering a solar direct fridge, cooker, pump, and blender. The audience included solar professionals and folks with extensive experience with solar, but most people had never heard of running a microgrid without batteries, and were very impressed.

We're really grateful for the work that the Footprint Project and similar organizations are doing, setting up renewable energy infrastructure in communities before and after disaster strikes. We're pleased to help get direct drive into their toolkit, so this technology can be deployed where it's needed.

Direct Drive in Cuba and Sierra Leone

We have had a few discussions with some folks in the Cuban Embassy about the suitability of direct drive solar in Cuba. Those discussions are ongoing, though no specific plans are in place yet.

In the meantime, we had a visitor this summer from Cal Poly (in California) by the name of Ryan. He works with Pete Schwartz on the Insulated Solar Electric Cooker project. With Pete and Ryan we have been talking to various people in Sub-Saharan Africa about setting up a solar direct drive demonstration project, including with an organization called Project Peanut Butter. They produce "Ready-to-Use Therapeutic Food" (RUTF) in several production plants in a few different countries in Sub-Saharan Africa. (You can see more details about their work at <https://www.projectpeanutbutter.org>.) RUTF is a life saving substance for malnourished children, more than doubling the survival rate of sick children in rural areas.

Given the unreliable nature of grid power, diesel generators are being used to produce RUTF. Ryan will be spending a few months in Africa this winter. A plan is coming together to convert a Project Peanut Butter processing facility in Sierra Leone to direct drive solar. These facilities feed thousands of severely malnourished children. It will be very important to make sure the facility runs at full capacity. We will probably oversize the solar panel rack slightly so the plant can run fully solar direct drive most of the time. Then we may have some high voltage battery backup. That would 'flatten the curve' of supply and demand a bit, but the battery set would be modest, and the plant could continue unhindered when the batteries wear out. Such a system would be a bit more sophisticated than what we have at LEF, but would be much cheaper than grid power, conventional solar, or diesel



Nika and a Carolina Cross watermelon.



Nika and a Charleston Grey

generators, and would provide a reliable power source that does not eat fossil fuel every day. This project could have a big impact, both in terms of saving money for Project Peanut Butter and increasing the public awareness of Direct Drive DC Microgrids (D3M).

Incidentally, Pete and Ryan have been working on a simple circuit that could improve the efficiency of direct drive by 30% or so. It is a voltage optimizing circuit that keeps the voltage up, even in low power conditions. (It's a mosfet driver in technical terms, or PWM.) We have one set up at LEF and will report on it's impacts in the next newsletter.

Welding Steel With Sunshine

In the early days of LEF, we thought we would purchase the machines and devices we needed instead of attempting much in the way of technology development here at the farm. That has all changed now. We invent things all the time now. Some of those things even work.

We have a fully tooled machine shop, with grinders, compressors, saws, a lathe, a mill, and all sorts of fun and useful tools. We have said for some time that our D3M can do anything but weld. Welding requires a lot of energy quickly. As the result of a misdirected shipment, we ended up with some free lithium (LiFePO4) batteries. Pretty hefty ones at that. Nice.

Welding is (usually) a done with high amperage, low voltage DC (direct current), so one can well with just batteries. But welding direct-off-the-batteries is like a race car with no brakes. Too much heat and not much control. After some messing about, we set up a welder using a golf cart motor controller (Curtis 1205M). It works pretty well. There are a few tricks, a couple of small auxiliary circuits that need to be added. But overall, it makes a very robust and reasonably controllable stick welder. For \$100 dollars (not counting the batteries), it's pretty cheap.

Is it safe? More or less safe than an ordinary stick welder? Not sure. The Curtis manual has only vague language: *"Working on electrical systems is potentially dangerous. You should protect yourself against uncontrolled operation, high current arcs, and out gassing from lead acid batteries."*

We have spent some years looking at many options for "sustainable" welding power. In the near term, batteries are less impactful than running a generator to run a welder. But what about long term? It's hard to say. For now, given the batteries fell into our lap, having a solar powered welder is very nice.



Nika and a Congo



Nika and a Florida Giant

New Solar Direct Drive Wiki

A friend of ours by the name of Phillip has created a new wiki about direct drive/ D3M. The idea is to have a website that catalogs and organizes the various technologies that we have developed, in a format that is easily accessible and easily editable. Check out the link and feel free to crosslink, forward, etc. Thanks Phillip!

<https://d3m.savemoneysavehumanity.com/>

Watermelons and Whatnot

Anyone who has ever visited LEF knows we have a terrible driveway/ entry road. We have been trying to fix that up. Our old machinery has crumbled under the task though. We have had to spend a lot of time repairing machines this summer. Hopefully we can get it done before the winter mud sets in.

This growing season has been marked by a very cool spring, two weeks of blazing heat, and now a very cool late summer. The deer have been a headache this year. We have a great crew at LEF, and we have put more effort into fencing this year. That has worked for the most part. Of our various seeds and food crops, we have had no outright crop failures this year. That's good. As farmers, we notice the impacts of climate change every year, with more extremes and weather anomalies.

We have had a good year for pears and jujubes, though not so good for some other fruits. We conducted a sizable watermelon test program.... or maybe we just planted a whole lot of watermelons because we wanted to. Eighteen varieties no less. With all the late and early coolness, it has not been a great year for melons. But we made some nice ones anyway. The kids are pleased, as are some of the adults.

The Future of Direct Drive DC Microgrids

As we head to press, there are various messages moving about between LEF and the folks planning to install solar power in Sierra Leone. We have been talking to a Spanish solar design firm called TTA (<https://tta.com.es/>). It seems likely they will be willing to help us put together a report that shows the costs and benefits of supplying grid power, battery-powered solar, and D3M to remote areas in the Caribbean and in Africa. TTA is a sizable company and could produce a report that would carry a lot more weight than something we published on our own.

We have been saying for quite some time that D3M like we have at LEF could spread rapidly, particularly in tropical regions. With D3M, there is no need for grid power, coal, natural gas, massive battery sets, or industrial "renewable" energy. It feels like the goal of spreading D3M more quickly is approaching. The Sierra Leone project appears to have funding for the solar conversion. *D3M is dramatically more cost effective than conventional solar. Once we demonstrate that clearly, and document the results, the gates should be open for the rapid spread of a whole new way of generating and using energy with a dramatically lower environmental footprint.*

Please support us if you can.

*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. **[Click here to make a tax deductible donation.](#) Make sure to designate your donation for Living Energy Institute.***

Articles, Videos, and Podcasts about LEF are [here](https://livingenergyfarm.org/articles-and-videos/). <https://livingenergyfarm.org/articles-and-videos/>