Climate Change and Community Revival

Communities

Life in Cooperative Culture

Renewable Energy

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Renewable Energy

VOICES

ON THE COVER

Roxy Olsson creates breakfast smoothies using muscle power, fruit, and water on the blender bike at Lost Valley Education and Event Center, Dexter, Oregon. This discarded exercise bike and thrift store blender make blending fun, fast, physical, and fossil-fuel free—while demonstrating the promise of renewable energy technologies, especially in community. Photo by Simon Walter-Hansen.

COMMUNITIES
Life in Cooperative Culture

EDITOR
Chris Roth *(Lost Valley/Meadowsong)*

ART DIRECTOR
Yulia Zarubina-Brill

ADVERTISING AND BUSINESS MANAGER
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COMMUNITIES (ISSN 0199-9346) is published quarterly by the Fellowship for Intentional Community at RR 1 Box 156, Rutledge MO 63563. Periodicals postage paid at Rutledge MO and at additional mailing offices. Postmaster: Send address changes to COMMUNITIES, 138 Twin Oaks Rd, Louisa VA 23093. Indexed in the Alternative Press Index.

SUBSCRIPTIONS: $24 US, $29 Canada, $31 outside US/Canada for four issues via periodical/surface mail. Single copies are $7 US, $8 Canada, $9 outside US/Canada. All payments in US dollars. Available from COMMUNITIES, 138 Twin Oaks Rd, Louisa VA 23093; order@ic.org, or order online at store.ic.org.

BACK ISSUES: RR 1 Box 156, Rutledge MO 63563; 800-995-8342.

EDITORIAL OFFICE: Chris Roth, Editor, COMMUNITIES, 81868 Lost Valley Ln, Dexter OR 97431; 541-937-5221; editor@ic.org.

FELLOWSHIP FOR INTENTIONAL COMMUNITY: RR 1 Box 156, Rutledge MO 63563; 660-883-5545; www.ic.org.

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ADVERTISING: Christopher Kindig, COMMUNIITIES Advertising Manager, Baltimore MD; 443-422-3741; ads@ic.org.

WEBSITE: communities.ic.org.

This magazine printed on recycled paper, using soy-based inks, at Allen Press in Lawrence, Kansas, USA.

LETTERS

Loving It

My husband and I LOVE the magazine. We're not communitarians (just in spirit), but I've written a couple small things for the magazine, and we read it cover to cover. Please keep up the great work. We're sharing our old issues with friends to encourage new subscribers. Issue #159 with the new contributors from Tamarack was really good and felt very positive. Their new voices were very complementary. And the Consensus series was EXCELLENT.

I'm also really enjoying #160. Great cover photo!

Kim Goodwin
Blachly, Oregon

Within Reach: An Update

In December 2012 (COMMUNITIES #157) Chris Roth wrote a wonderful, lengthy, and detailed review of *Within Reach*. I was overjoyed that his review touched upon many of the efforts we spent over five years toiling over to get right in the movie—things such as editing 1000 hours of incredible wisdom from hundreds of amazing people, down to 90 minutes in a way that gave breadth as well as depth. I saw that the end of the article was needing some help on updating the audience as to what I've been doing since embarking on my own solo path as of July 2012.

For the year since, I've been living on farms/communities on the island of Kauai, helping with sustainability projects, consulting on community-building, holding down full-time jobs related to media-making as well as continuing to create media in many other ways, finding my twin flame soul mate Constance, getting married to her, as well as creating a baby with her.

The lessons of the past year have included learning that when I dive too deep too fast into community, it is not a healthy pace. When coming from the extreme of an introverted, isolated, and disconnected life, it's key for me to pace a bit at a time into community, as growing pains are minimized that way. Autonomy or freedom needs to be balanced into the equally important need for community, as both are fundamental human needs according to Manfred Max-Neef's work on Human Scale Development. Remaining in a personally empowered place, feeling filled with self-esteem, standing on one's own two feet, yet seeking ways to become more interconnected and interdependent, cooperate, co-create, share, and create community, are all great ways to start. Ride shares, occasional meals, sharing seeds, labor, tools, and having fun together are all things that can be paced into while finding balance.

The world is getting more sophisticated and complex in its issues, and to me sustainable community is a timeless solution and one that I will always deeply believe in. This solution remains in many ways very simple and straightforward. It's just a lifelong challenge, for me and many of us, to learn how to make the leap.

Continuing education is essential for anyone interested in personal growth, fulfilling their greatest potential, and being able to make this slow-paced lifestyle change into sustainable community. I was honored to be asked to help create the world's first FREE online permaculture course earlier this 2013, and was able to add to it 78 hours of edited interview video footage from the raw footage of the movie. That is all now available at www.permaculturedesigntraining.com and hopefully this will be a resource that everyone can use to delve deeper into sustainable community.

With love and aloha,

Ryan Ao
www.ryanao.com

We welcome reader feedback on the articles in each issue, as well as letters of more general interest. Please send your comments to editor@ic.org or COMMUNITIES, 81868 Lost Valley Ln, Dexter OR 97431.
Your letters may be edited or shortened. Thank you!

Statement of Ownership, Management, and Circulation.

Communities, publication #0199-9346, is published 4 times per year with annual subscription of $24. Contact Kim Scheidt 660-883-5545. Publisher's address, office of publication, and publisher's headquarters is Fellowship for Intentional Community (FIC), Rt. 1 Box 156, Rutledge, MO 63563. Chris Roth is Editor. Owner is FIC, a nonprofit, nonstock corporation. No security holders. Tax status unchanged in preceding 12 months.

Extent& Nature of Circulation	Avg. No. Copies Each Issue During Previous 12 Month	No. Copies of Single Issue Published Nearest to Filing Date
A. Total number of copies (net press run)	3038	2350
B. Outside county paid subs	997	930
1. In-county paid subs	3	3
2. Sales through dealers and other non-USPS paid distributions	1614	1066
3. Other classes through USPS	8	5
C. Total paid distribution	2622	2004
D. Free/Nominal Distribution		
1. Outside Country	0	0
2. In Country	0	0
3. Other classes through USPS	0	0
4. Outside the Mail	24	0
E. Total distribution	2646	2004
F. Copies not distributed	392	346
H. Total	3038	2350
I. Percent paid	99%	100%

PUBLISHER'S NOTE BY LAIRD SCHAUB

UNPACKING THE DYNAMICS OF A PACKED CAR

As I write this, I'm halfway through a five-week road trip that has me on the East Coast. When I pulled out of Missouri at first light Aug 28, it was still full summer, with the hot weather getting old and the hot peppers just starting to roll in. When I finally make it back to my home community's driveway (35 days and 3500 miles later) it will be October, the foliage will be assuming its fall mantle, and Sandhill Farm's sorghum harvest will be well underway.

I've been a road warrior for decades and long-distance drives across time zones are nothing new for me. Conscious of the non-renewable nature of the gasoline that powers our vehicle fleet, I try to take the train whenever I can, and try to fill the car with passengers and products when I can't—to make the consumption of gasoline as righteous as possible.

In this essay I want to explore the uneasy intersection between energy efficiency and sustainable relationships, of which my current trip has been an illuminating example.

Anywhere from three to six times a year, I attend community-related events as a speaker, workshop presenter, and/or general resource about community living. (For more on my fall calendar, see "An Eventful Time of Year," my blog of Aug 23.) Where possible I look for opportunities to represent Community Bookshelf, FIC's bookselling arm. If we can make suitable arrangements with event organizers and it makes sense logistically, then I pack a Sandhill car with boxes of books and drive to the event (in lieu of taking the choo choo).

Such was the case for my current trip, which is bookended by the Twin Oaks Communities Conference on the front end (Aug 30-Sept 2), and by the Northeast Cohousing Summit in Cambridge MA on the back end (Sept 28-29). In between I have the following itinerary (skipping the social stops):

- Sept 2-4 FIC fall organizational meetings (Louisa VA)
- Sept 5-8 Weekend III of a NC-based facilitation training (Floyd VA)
- Sept 14-15 Ecovillage Network of Canada meetings (Caledon ON)
- Sept 16-17 Meet with Tamarack Institute (Waterloo ON)
- Sept 21 Conduct consensus training for a forming cohousing group (Cambridge MA)
- Sept 22 Conduct training with Mosaic Commons (Berlin MA)

Thus, on this particular junket, I'll be able to rep Bookshelf not once, but *twice* (for which I'll surely get extra credit in the Akashic Records, Sustainability Division). Once having set up the trip and reserved the vehicle, I made it known that others could travel with me on a space-available basis. Then the fun began...

My trip essentially divides into four segments:

Leg 1: Missouri to Virginia
Leg 2: Virginia to Rochester NY
Leg 3: Rochester to Boston
Leg 4: Boston to Missouri

Here are the logistical considerations that I tried to balance:

—While my wife and co-trainer, Ma'ikwe Ludwig, was attending the same three functions as me on the front end of the trip, and she had the inside track on reserving space in the car, she doesn't do well on long-distance drives (because of chronic

Lyme disease) and she opted to travel to Virginia by train instead—avoiding the 900 miles of Leg 1.

Despite that, she reserved car space for her and Jibran (her 16-year-old son) for Leg 2, a distance of 900 *kilometers*. To be sure, kilometers are less than miles, though only by two-thirds. It can be a fine line.

—My pattern for long distance car trips is that I take whatever Sandhill vehicle is the least popular one at home. Often this means a car without air conditioning, and that can make a significant difference to passenger comfort when negotiating the long, hot days of late summer. Ma'ikwe had recently challenged me about that, and thus I made sure to secure a car with A/C, giving up some carrying capacity to do so. (I was not going to make the mistake again of emphasizing payload over her comfort.)

—Alyson Ewald is an FIC Board member who also lives in Rutledge MO, at Red Earth Farms. She wanted a ride East for Leg 1 and I was happy to oblige. To sweeten the pot she asked for—and got—permission for her partner, Mark, and their five-year-old daughter, Cole, to join the party. While Alyson was attending the Twin Oaks Conference and the subsequent FIC organizational meetings, Mark and Cole would visit Mark's father in Virginia.

Alyson lobbied for taking the Sandhill vehicle back home (so that their travel would be subsidized both ways), but I told her that wouldn't work. I needed to keep the books on the East Coast for the cohousing summit at the end of September. While disappointed, she understood.

—I had also been approached by a person visiting northeast Missouri who was a member of Twin Oaks on a personal affairs leave. He wanted a ride back East also, but I turned him down for lack of room (excepting that I was willing to ferry a knapsack of his to VA).

—FIC has recently hired a Business Manager, which is a role we had not had previously. In pursuit of his mandate to boost sales, he asked that extra copies of our books and magazines be shipped East for the events. The problem was where to put all that stuff in the car. When I alerted him to the space limitations, the order was adjusted downward but we still schlepped a few boxes more than we usually take to events.

—At the outset of Leg 1, we had to squeeze everything in the car to the point where the front seat passenger had a guitar case riding on their legs the whole time.

—All the space liberated by selling the equivalent of four boxes of books at the Twin Oaks conference was eaten up by the need to back haul surplus products that had accumulated at our Virginia Office and needed to be transported to our Missouri Office. That meant that Ma'ikwe and Jibran were just as sardined into the car for Leg 2 as Alyson, Mark, and Cole had been for Leg 1. Ufda.

• • •

So far (the trip is only half over), I've managed to disappoint everyone. The Business Manager was hoping that more product could have been delivered to the events. All of my passengers were hoping for more spaciousness (less crowding) for their rides. The guy on leave from Twin Oaks didn't get a ride at all (only his rucksack did). And our Virginia Office was hoping that I'd be able to take some boxes of *Communities Directory* back home, for which there was no room at all.

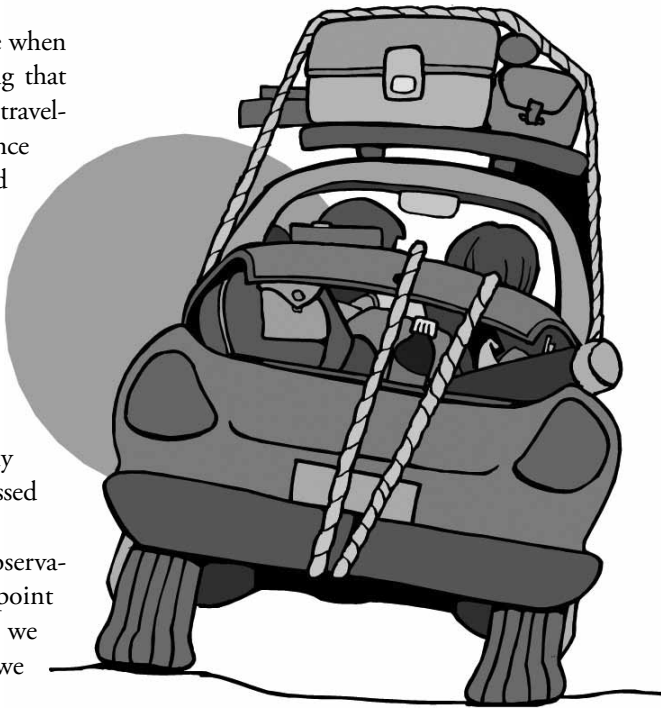
Against this backdrop I was tense when loading the car for Leg 2 (knowing that Ma'ikwe, Jibran, and I would be traveling all day in a car that added nuance to the phrase "fully loaded," and already weary of people being disappointed by how I was balancing the requests made about the vehicle's use). Ma'ikwe and Jibran graciously tried to offer suggestions to aid in the packing and I turned them down brusquely, which behavior Ma'ikwe properly labeled as unhelpful when we processed the exchange the next day.

She was right—both in the observation and in making the choice to point it out. While it wasn't awful, and we all got in a better mood once we were underway (for 11 fun-filled hours together in a jam-packed car), I could have made better choices about how the day started.

Now four days removed from that experience, I'm wondering what I've learned. I *still* want to help people out, and I *still* want to get the most out of burning gasoline when I make long-distance trips. How will it feel to turn down requests for a ride so that more product can be shipped? How will it feel to ship less product so that passengers will be more comfortable? I'm not sure. At the very least, I can involve other affected parties earlier in the process, so they can make more informed decisions about what to ask for and what to expect.

Upon reflection, it occurs to me that it's a good thing I didn't move to community to avoid facing hard choices. ❧

Laird Schaub is Executive Secretary of the Fellowship for Intentional Community (FIC), publisher of this magazine, and cofounder of Sandhill Farm, an egalitarian community in Missouri, where he lives. He is also a facilitation trainer and process consultant, and he authors a blog that can be read at communityandconsensus.blogspot.com. This article is adapted from his blog entry of September 14, 2013.



Community Makes Renewable Energy Work

By Alexis Zeigler

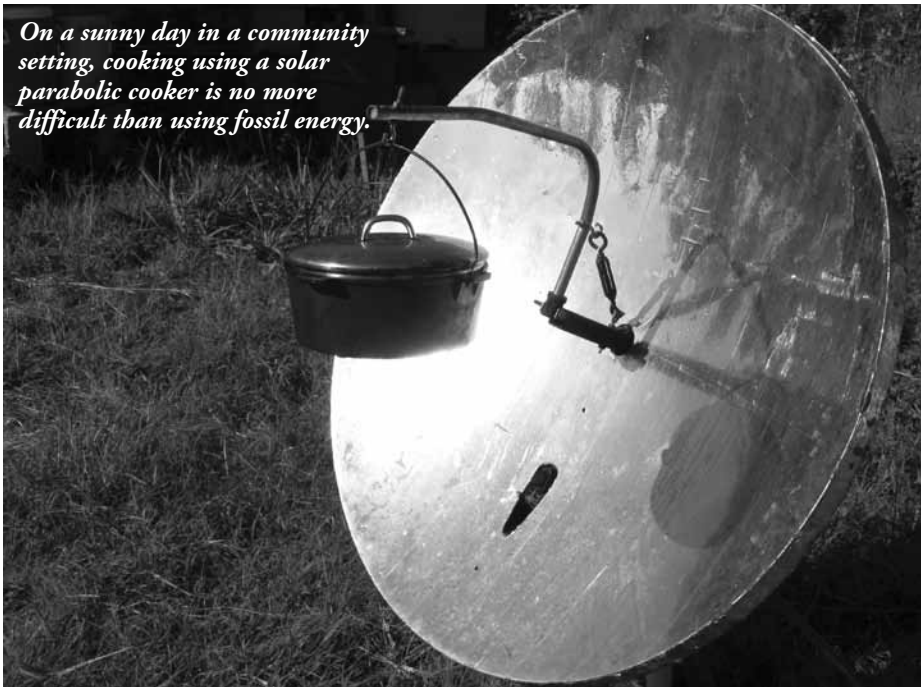
Renewable Energy is one of those terms that sound inherently virtuous, like peace or universal love. Once you start to look at how renewable energy is used in our time, the inherent virtue is washed away and a much more complex picture is left in its place.

That lesson was brought home to me recently when I was teaching a workshop about plant propagation. A fellow who had come to my workshop stayed afterward to chat. Turns out he works for the local power company, one not known for environmental thinking. He works in a generating facility that takes trees and burns them to make electricity. "The public doesn't understand," he was saying to me. He was upset to see the incredible volume of wood being consumed to produce only a tiny fraction of power demand. Indeed, if you study the issue, you realize that the United States burns far more energy than can be produced from bio-sources. (The estimates I have seen put our total current energy use at 25 percent higher than all the energy produced by all the green, photosynthesizing plants in our country in a single year, domestic and wild.) In spite of his concerns, he had to make a living, working in a facility that takes dozens of acres of forests every day and burns them to keep everyone's air conditioners and tumble dryers running. And the power company is getting tax credits to make "green energy."

The reality is that renewable energy cannot power the modern industrial economy—not even close. But there is another answer, and that answer is cooperative use. A few years ago I asked all of my environmentally minded friends to send me their domestic energy bills for three years. I added them up and compared them to American average residential energy use. I also collected energy bills for a number of cooperatives and communities. The results were staggering.

The average use of my conscientious friends, in spite of their efforts to insulate, moderate thermostat settings, etc., was *above* the American average usage. It turns out that if you own a house that stands by itself, even if you are saintly, you are likely to use more energy than a slob in an apartment that has other apartments around it. Lots of the apartment dwellers, slobs or not, are included in the American average. It was also surprising to look at the numbers from various communities. They dropped over a cliff from 60 percent of American average energy use all the way down to 9 percent. (That last number is for a group house that I built. That house is cooperative, strawbale, and solar heated.)

Fossil energy is concentrated stuff. Simple, cheap, small machines can convert fossil energy into heat or mechanical power. Renewable energy is, by comparison, slow and steady, dispersed, and intermittent. Every energy source has an



On a sunny day in a community setting, cooking using a solar parabolic cooker is no more difficult than using fossil energy.

A solar hot water batch collector becomes economical when shared.

Photos courtesy of Alexis Zeigler

Smokey the woodgas unit creates tractor fuel.

Pedro the biogas digester performs reliably when well-fed.

Solar ovens can not only cook and bake, but also dry food.

optimal economy of scale. The political reality of modern environmentalism is that it is easier for the environmental groups to sell supply-side solutions than to tell people to change their lifestyles. But physics don't care about politics, and the physics of renewable energy are that they don't work well on an individual scale. They work really well on a community scale.

Even a simple solar hot water system seems expensive and uneconomical for someone living alone, or even a small family. But at the community level, the costs are divided by the number of users while the overall efficiency skyrockets. I have built quite a few renewable energy systems. I would not have believed the numbers had I not seen them so many times now, but the mathematics of solar energy do magic when solar systems are developed for cooperative use. Shared housing makes solar energy work because it creates a modest economy of scale. If solar energy is cross-pollinated with good insulation and design, you can get extraordinary efficiencies at very modest cost.

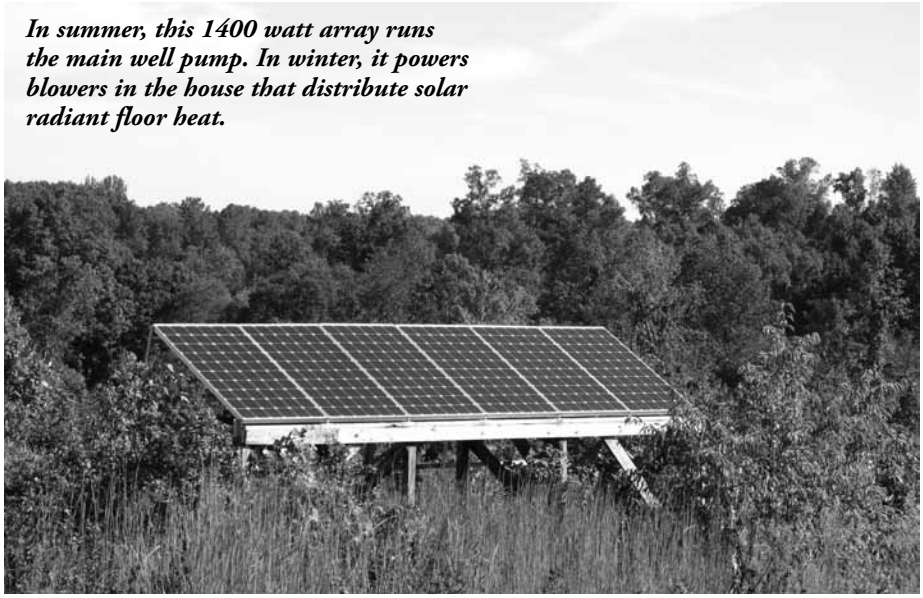
These lessons have been sharpened even further as I have been working on a project called Living Energy Farm (LEF, livingenergyfarm.org). (I am one among many working on LEF, so my perspectives are my own.) At LEF, we have a solar parabolic cooker. We refer to it affectionately as the "death ray." That is because you can put a stick in front of it on a sunny day and the stick will burst into flames in about three seconds. No joke. The overall BTU (heat) output is similar to a gas burner on medium. We use it a lot. We also have a solar oven that we use for baking as well as solar drying. Particularly on a parabolic cooker, solar cooking is no more difficult than using fossil energy. You just hang the pot up there and off it goes, just like you put it on a gas burner. Community makes it work. In the commuter culture, people don't have the time or space for solar cooking. In a community, a village, or a cooperative where one person can cook for others, solar cooking is simple, easy, and as sustainable as any technology could possibly be.

At the community level, costs are divided by the number of users while the overall efficiency skyrockets.

We also have a biogas system. We call that one Pedro, though I don't have a clue how that bubbly little beast got its name. It's like tending a woodstove. We have to feed Pedro and keep him warm. He makes gas pretty reliably at this point, though we will need a bigger system for the whole community. Fiddling with a gas digester is easy on a farm, in a community, or in a village. Community makes the technology

viable in a practical sense.

At LEF, we also have a woodgas system for our farm tractor. Woodgas was used heavily in World War II in Europe. It allows you to run a gasoline engine off of woodchips. But the important part is not the technology, but how and for what it is used. Even during the short duration of WWII, parts of Europe started to see deforestation problems as the trees were being cut to run the machines. Our bylaws allow us to use woodgas on the farm, in the community, but not over the road. We are on the second version of our system, and also heading toward a second generation of draft animals. These technologies work in community. They do not work in individualized society.



In summer, this 1400 watt array runs the main well pump. In winter, it powers blowers in the house that distribute solar radiant floor heat.

At LEF, we have a few solar electric systems, of different configurations for different purposes. (It seems like we can do what we need to do for the whole community with about 2300 watts.) In general, we try to use electricity when the sun shines instead of trying to store it. That means pumping water during the day and using drip irrigation. We are still building the main house. The irrigation water will run through the main house and suck heat out during the summer before the water goes out to the fields. Free air-conditioning, more or less.

The house is also solar heated with both passive and active (pumped) features. Our commitment is to building reasonably cheaply so that our model can be replicated. Back in the 1970s, people built active solar houses. But they either used fluid systems, which require copper collection panels and are thus expensive, or they used air systems and tried to store the heat in rock beds for later use. Then they would have to store electricity to pump the heat back into the house later. They made complicated, expensive systems because they were working from a fossil-fuel paradigm. For us, we start with the assumption that we are designing our lifestyle to fit renewable energy, rather than trying to force renewable energy systems to meet an individualized lifestyle.

This antique piston pump, good for solar energy supply fluctuations, pumps at low or high speeds.

At LEF, the solar panels that run our irrigation system don't do much in the winter as we don't need much water, so they run our solar blowers in the house. This close integration of systems works in community but breaks down across barriers of separate ownership of separate structures. The heat is stored in a high-tech material under the house called dirt, where it naturally conducts its way up into the living space. The living space is assumed to be in regular use with inhabitants who are capable of opening and closing windows, thus eliminating a bunch of batteries, computer controllers, and pumps. The sharing of expenses and space makes it financially feasible, desirable even, to invest more effort and money into features such as active solar heat.

Our lighting at LEF uses DC LEDs powered by nickel-iron (NiFe) batteries. NiFe batteries are an old technology. We have one with Thomas Edison's name stamped right onto the side of it, made by his company. The miraculous thing about that little battery is that it still works! Lead-acid batteries are much more popular, but they die after a few years and have to be replaced. (We ship them to the less-developed world where people are poisoned in the recycling industries.) The NiFe batteries are low-output. You can't start you car with them. That's why the lead-acid batteries are

This 500 watt PV array runs Living Energy Farm's construction tools.

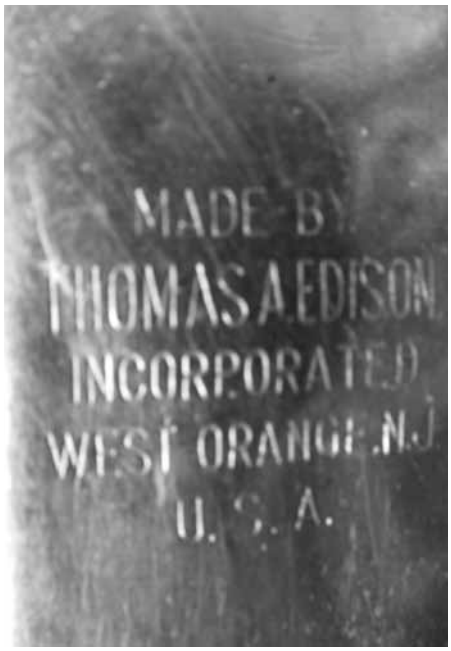
so popular, because the presumption of power needs is so high. But for us, NiFes are perfectly suited to DC LED lighting systems that draw modest amounts of energy over extended periods of time.

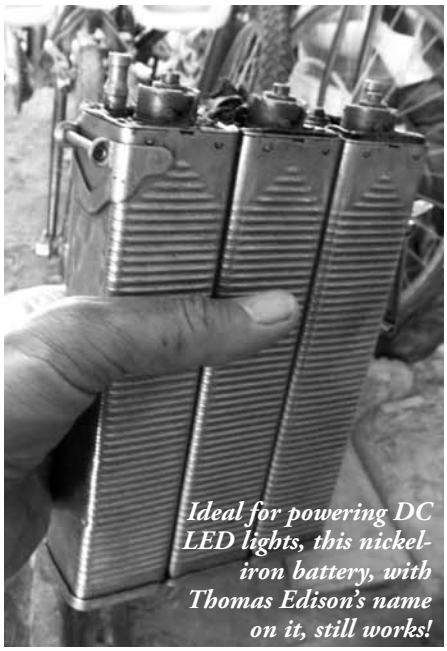
We intend LEF to be financially self-supporting. We want to make sure our renewable energy systems are not just mechanically adequate, but financially feasible as well. We are earning our living with agriculture, growing open-pollinated seeds. My personal passion is for "perennial food," my term for fruit and nut trees. The individuation of the American lifestyle and the industrialization of agriculture to feed people disconnected from those farms has created many problems we need not recount here. Community-level agriculture creates opportunities for the integration of systems that supports renewable energy. Animal manure can feed a biogas digester. The chickens can eat bugs under the fruit trees, instead of using expensive and energy-intensive chemical sprays. Irrigation water becomes a heat-absorption medium. "Waste" biomass always finds a home. Machines parts, pipes, and various sundry mechanical widgets migrate from one project to another.

My experience with LEF has sharpened my understanding of the intrinsically supportive relationship between renewable energy and community. But even before LEF, the importance of using renewable energy at a community scale instead of a private household scale was very clear. I have traveled the country giving slideshows and presentations about these issues, and about the relationship of energy supplies and the evolution of our civil society. I will not delve into that latter point here, except to say that ecological stress will be the death knell of democracy if we don't wise up.

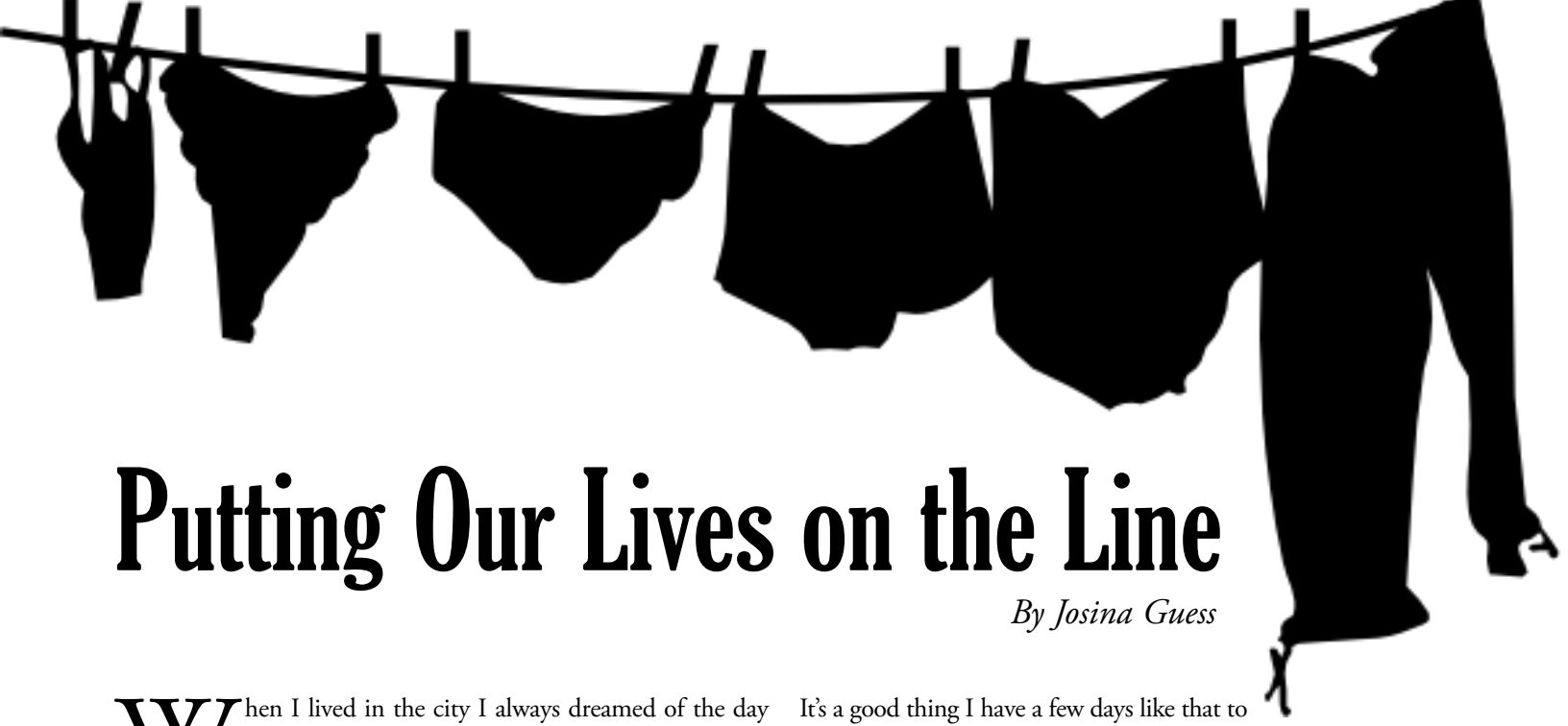
Private ownership and control are deeply ingrained in the American psyche, and "the environment" is mostly an abstraction. If someone wants to invent a more efficient windmill or solar panel, that's fine, but we don't need it. If you want to blame the powers that be, you can do that, but we are all sinners in the ecological catastrophe of our time. Good policies would help, but they are not what is most important. What is most important is for you to take the tools you already have, the information you already know, and get together with other people and act on it. Our entire political, academic, and religious tradition taken in total is a grand project to make powerful people look important. The reality is that we have always been in charge, and we always will be so. If you want to solve the environmental crises of our time, you need to work in cooperation with others to build a truly sustainable infrastructure based on renewable energy systems applied at the community level. That's where physics and politics meet. That is the path to a sane and sustainable future. ❧

Born on a largely self-sufficient farm in rural Georgia, Alexis Zeigler is a self-taught activist, builder, mechanic, writer, and orchardist. He has organized numerous successful campaigns focusing on political, environmental, and economic localization issues. He is currently working to build Living Energy Farm (livingenergyfarm.org), a zero-fossil-fuel farm that will be economically self-sufficient. He recently released a book entitled Integrated Activism *(North Atlantic Books).*





Ideal for powering DC LED lights, this nickel-iron battery, with Thomas Edison's name on it, still works!



Putting Our Lives on the Line

By Josina Guess

When I lived in the city I always dreamed of the day that I might have a big clothesline. My fantasy began as a teenager in Washington, DC. My mom set up a small line in our big-for-the-city backyard and I fell in love with the smell and feel of sun-dried clothes. When I began a family of my own in Philadelphia I hung diapers and sheets on lines that criss-crossed over our cement postage-stamp of a yard. Sometimes I would chat across the chain-link fence with a neighbor who also hung her clothes. She lamented that fences now divided up the yards and alley in which children would play and community would form as clothes fluttered in the breeze.

Now that I live with my family at Jubilee Partners, a Christian service community in Comer, Georgia, my dream of a giant community clothesline has come true. And of course, as with most fantasies, the dream is tempered by reality.

As a small way to reduce our energy consumption, our community of about 40 staff and volunteers shares two (three, if they are all working) washing machines and one huge clothesline. The clothesline consists of 15 70-foot-long steel lines strung between three sets of very sturdy posts. When three families started this community in 1979 the clothesline was one of the first things they built. There is a laundry sign-up sheet in which each person or family has one or two two-hour slots a week in which to use the washing machines. We also have time set aside to wash guest linens, kitchen linens, and cleaning rags. The shared clothespins hang in sturdy gallon jugs that once held vinegar or maple syrup.

A community clothesline does much more than dry clothes with solar power; it can help to build community. It teaches the need for better cooperation and communication, requires deeper attention to the rhythms of nature, and provides a place for quiet contemplation and good conversation as well.

On a "perfect" day I will have our wash done very early and hang the clothes in the golden dewy morning to the serenade of birds flitting between blueberry bushes. After lunch I will check my laundry and find it nicely dried by the sun and breeze and I will have time to get it folded before the kids get home from school. It's a good thing I have a few days like that to remember on the not-so-good days...like those when clean wash sours in a basket after a day of patiently waiting to be hung while my family and I flutter in six different directions; or when I bump my head as I try to hang or take in clothes in the dark because I can't find the headlamp or batteries for it. One evening my husband was taking in the clothes by moonlight when he saw three skunks digging in the grass beneath the clotheslines. Thankfully they did not spray. If they had I would be writing the story, "The day I gave up on the clothesline."

This summer we got so much rain that it really put my love for line drying to the test. Clothes would hang hopelessly sodden as the rain poured day and night without mercy. Some things would be so heavy with water that they would touch the ground below and need to be washed again. Sometimes towels would dry so slowly that they would begin to mildew and smell worse than before they were washed. The sun would shine and we would all rush to get laundry done and hung, but before the clothes had time to dry the storm clouds would form and we would then rush to bring in damp clothes before they became drenched. When the line is just not an option laundry hangs from makeshift lines in bedrooms, living rooms, and porches. On one particularly bad day, the rain seemed to finally break and the forecast called for only a 20 percent chance of rain but it poured three times. One community member shook his fist at the clouds in anger and drove his clothes to the local Laundromat to tumble dry. We do have our limits.

Though the heavy rains are bad, there are other forces of nature that can also hamper the romance of line drying. Here are some things I have learned: Hang clothes in mid-day and suffer the sun's heat, wait until evening and get bit by mosquitoes, oh and watch out for the fire ant hills. One can always hang clothes on the shady side of the line to avoid the heat of the sun, but during mulberry and blueberry season purple bird droppings will remind you that comfort comes at a price. It is important to pin things securely because heavy winds can tangle sheets and send clothes flying. One must take care to

bring clothes in promptly and give them a good firm shaking lest wasps, bats, and bees take up residence. It is nice to let young children play in the sand while you are hanging laundry but be sure to grab those sandy hands before they grab your neighbor's clean sheets. Frozen fingers on crisp frosty clothes add an extra challenge to winter drying; be sure to dress warmly or just hang your wash to dry inside by the wood stove to get through the coldest days.

This practice of line drying also connects us with the majority of the people in the world who do not have dryers. As I was enjoying hanging laundry on a pleasant day my friend confided to me, "I hate hanging laundry." She grew up the youngest in a large family in rural Mexico and has put in countless hours hanging and taking down laundry. "It just takes too much time." Her honesty reminds me that my appreciation of line drying does not immediately impact the lives of my global neighbors and they aren't all enjoying it as much as I do. Yet I am still thankful that my kids are learning and working alongside her kids and sharing a common experience, even if they don't wax poetic about it the way I do. I do hope that even if we can't see it, our local choice to use less electricity is making a long-term difference for our neighbors around the world.

Through it all, we are certainly saving electricity, but there are times that I do still wonder, like my friend, about the overall efficiency of hanging out all our laundry to dry. Surely, we all could find other things to do with our time than brave the elements while we pin and unpin clothes from a line, day after day, week after week, month after month. Are those hours truly a good use of our corporate *human* energy?

The fact that we are all in it together makes a huge difference. Sometimes an unfinished conversation will carry over the next morning at the clothesline. Sometimes it is only at the clothesline where folks that don't normally make time to talk are standing still long enough to really check in with one another. There are times when my day has been so packed that I've even suggested, "meet me at the clothesline" as a place for deeper conversation to happen. Even times of solitude at the line are valuable. Carefully pinning each item, I sing to myself and remember to pray for and give thanks for each member of my family. Glancing over at the sheets and embroidered pillowcases of a newlywed couple or the diapers of a new baby or the blouses of an elderly member or the bike clothes of an avid cyclist, I am reminded to pray for them too and be thankful for their presence in our community.

And yes, we see each other's underwear; this makes it hard to take yourself or other people too seriously. It can hardly be called heroic work to put our lives on the line in this way. In fact in this age of productivity and efficiency it could seem more foolish than valiant. But the daily task of hanging laundry forces us to slow down and it keeps us connected to the earth, to one another, and even—if we keep our hearts open—to God. Meet me at the clothesline if you want to talk more about it.

I've even suggested, "meet me at the clothesline" as a place for deeper conversation to happen.

Josina Guess lives and works at Jubilee Partners, a Christian community that offers hospitality and English lessons to refugees. Learn more at www.jubileepartners.org. She is a graduate of Earlham College and worked as a doula and children's minister in Philadelphia before moving to Georgia in 2011. She often thinks about what to write next while she is hanging laundry.

Author standing in front of the clothesline in the rain at Jubilee.

Clothesline in the snow.

Michael Guess

CLIMATE CHANGES: Turn to Face the Strange

By Christopher Kindig

It is a rainy afternoon—the kind I always love for its ability to cool things down and set a calm mood, as if the world is moving at a bit slower or quieter pace. Nature is foremost, apparent, audible. And every drop makes the gardens happy, which allows me to skip watering duty.

This particular late spring in Maryland has seen more heavy rain than in my memory of growing up here. Sipping green tea at my desk, I listen and take it in, and wonder if it is part of the new normal. Melting icecaps and rising temperatures are gradually rearranging weather patterns, which in the mid-Atlantic region is manifesting, among other ways, as increased precipitation. A turning of the handle tells me my lovely fiancee is home from work.

We smile widely at each other. She slumps off her heavy backpack of social work and art therapy gear, pulls her jacket off onto the chair, and plops down onto the bed. Instant savasana. I sense a little something more than just the tired, relieved, after-work bed dive.

Was it something difficult that happened with one of her therapy clients, who face troubling circumstances every day? Was it something existential, say about the "need" for the hustle and bustle of working full time? Was it a resurgent longing for world travel and exploration? I implore sweetly, now lying beside her.

"It's Climate Change." She turns to look at me with honest despair lingering in her usually happy eyes. I sigh deeply. It is the second time this month.

Knowing what I do, how can I console my wife-to-be in the face of this realization of such great magnitude, and of potentially ominous and far-reaching consequence? What can I say when what is happening has been so greatly unmatched by humanity's awareness and action?

How can I protect her, our family, our homestead, and the community we wish to create, from a *freaking changing ecosystem*? As if life isn't complicated enough, just add on the rapid undoing of weather predictability, temperatures, and sea levels. Not to mention the potential disruptions in public health, energy, water, crops, and the economy...just to name a few.

Responding to Climate Change

I start in on a measured answer.

I begin by empathizing that it can be scary to think about, and sad to acknowledge. I have definitely been there (more on this later).

I explain that it is true that we do not know exactly how climate change is going to unfold, and how much clean energy and sequestration technologies will be online fast enough to slow the effects, or possibly even to reverse them. We can, however be certain that some change is already baked into the equation. It does indeed suck, but at least we are aware of it and there is a lot of information to help us respond to it the best we can. We will have to accept what we cannot change, see what we can do to respond, and help others to respond as well. That we are paying attention already is most important.

In terms of safety, I explain that there will not likely be an event which we will not be able to respond to. If there is one that we have absolutely no chance to respond to, that is just our fate.

To feel more confident in this perspective, we launch into a mini research project to determine the patterns of natural disasters in the US, and how it is expected that temperatures, water levels, and storms will change in our part of the world.

What we discover is that where we are planning to settle, near the mountains in the wilderness and farmlands of western Maryland, is going to be a solid place which addresses all of our biggest concerns about climate change, all while being less than two hours from our parents, friends, and families. We couldn't B'more* excited about being able to live our dreams while still being so close to home. **[Editor's Note: this Baltimore pun is intended.]*

Also thankfully, many of our existing interests and plans, and likely those of many of the readers of Communities, are already lining up with what people can do to effectively respond to Climate Change.

- Practice self-sufficiency via gardening, composting, fermentation, sprouting, etc.
- Learn permaculture so you can work

more effectively with land, plants, and animals, manage water resources, and foster ecological abundance.

• Pick up and use practical DIY skills, such as how to find answers and produce solutions.

• Nurture good relationships and build a stronger sense of community. For us it is not yet through an ecovillage, but through sharing a house with roommates, plus through work, family gatherings, hike clubs, and friends.

• Give back through the work that you do. Make sure that you, other people, and the world are better off and more happy because of the causes to which you dedicate yourself.

• Grow from successes and mistakes, develop your character, stay fit and healthy.

• Enjoy life, stay positive, and laugh, despite the circumstances. What are we alive for, if not to enjoy life!?

After exploring the topic from various angles, Karen and I start to breathe a collective sigh of relief, with cloudy uncertainty replaced by a brighter sense of resolve and creativity about our future. Little smiles around her eyes are a sight I am relieved to witness. She appreciates the talk, and reflects that it is so difficult because of how recent of a realization it is for her, the scope of it all, plus how it is compounded by planning to bring children into the world in a few years.

Through the difficulty of the topic and heaviness of the realization, I am so thankful that she is thinking about all of this, and that we have a plan together of how to respond. I encourage you, your family, and your community to talk about this issue and how you will respond as well.

Community Responses

Intentional communities are in a unique position to respond to climate change. First and foremost if they share strong bonds of respect, teaching, cooperation, and problem solving with their group, they will more likely be able to address new challenges with creative solutions.

Because of the way in which many intentional communities are organized, both ethically and practically, they already share many resources and create less waste. Communities have much smaller environmental footprints and therefore need less than their suburban counterparts.

Many communities also emphasize sustainability and self-sufficiency as core components of their purpose, and have programs that work to produce high quality organic food, harvest clean energy, and nurture a better relationship to the planet. These characteristics give communities the opportunity to thrive through climate changes.

Climate Crusaders

Another reason to be confident that we have a fighting chance against climate change is that there is a small army of exceptionally talented people out there working on this crisis from every different angle. Brilliant and skilled people who are passionate about making a difference are bringing together new energy innovations, multidisciplinary teams, and reimagined strategies to turn innovative potentials into realities today.

Over the last decade the headlines have steadily appeared about new game-changing energy technologies. In laboratories, universities, startups, garages, big companies, accelerator programs, and competitions around the globe, dozens of new ways to produce and store green energy have emerged. For example, using futuristic advancements such as lasers, nanotechnology, or biotechnology, scientists have more than doubled solar cell efficiency from where it has been lingering for close to 40 years, and cut the cost of producing solar power to a fraction of what it has been until now, making it even cheaper than coal-fired power. Tapping into the sun will be a new

Christopher and Karen.

Baltimore garden.

renaissance for humanity.

New biofuel technologies are allowing people to grow high yield, low cost, and low resource-intensive algae for producing biodiesel, ethanol, or biogas. You can find do-it-yourself guides and technology to produce it yourself on OrganicMechanic.com.

Tesla Motors is innovating to bring their $100,000 Roadster down to $35,000 for a pure electric performance plug-in car. They are aiming to further reduce that price by half over the next decade. Most of their charging stations use solar energy and the network is expanding. With the current stations one can now drive from LA to NYC on clean solar electrons alone!

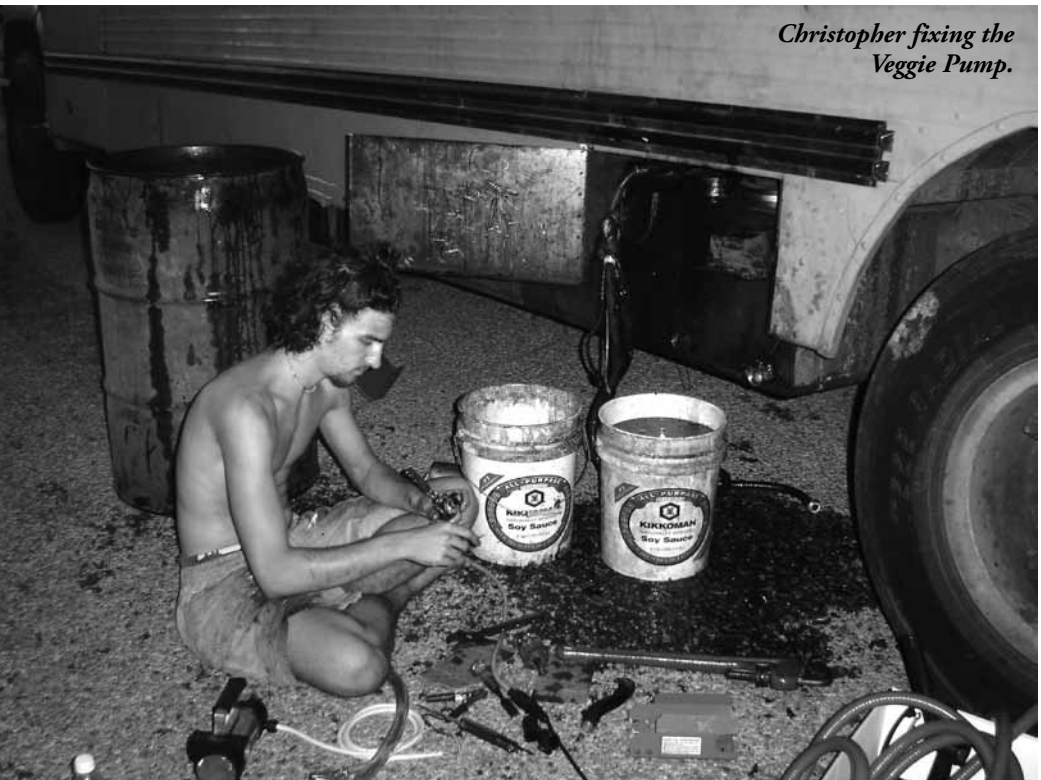
Also promising, and seemingly completely under the radar from the public's attention, the President and his team have laid a legal framework to make carbon pollution officially a dangerous poison that the EPA can regulate. Specifically this means that coal-fired power plants and other large polluters are going to have to reduce their dangerous emissions. This will spawn innovation to create and use energy more efficiently, as well as new sequestration technologies which could even repurpose waste into raw materials.

I wrestled with depression about the tragic degradation of our planet and what this means for future generations.

Nonprofits and other organizations are also bringing their weight to bear, and groups such as 350.org are advancing the cause and deserve much praise for rallying unprecedented support in demonstrations around the globe to bring attention to this issue. Many more initiatives to raise awareness exist, and they could all certainly use your help and support!

Turning Green Torment into Pathways Forward

I was definitely able to empathize with my fiancee's fears and concerns about impending Climate Change. Yet since I have been working in the field of green technology for nearly a decade, and investing my heart, mind, and tears in environmentalism for much longer than that, I have already gone through a lot of torment surrounding the issue.



Christopher fixing the Veggie Pump.

I wrestled with depression about the tragic degradation of our luscious planet Earth, and what this means for animals and future generations. I often worked through the night with chest-thumping anxiety due to the overwhelming feeling: that so few humans seem to care at all about the fate of our planet. I experienced anger at people, companies, institutions, and beliefs that perpetuate problems and stall solutions. I dealt with wrenching toxic guilt over my role in what to personally do about it all.

Through all of this I am now much more accepting and informed of what is happening, how to stay sane despite all of it, and how to play a realistic constructive role in the way forward.

After touring around the US on a biofuel powered school bus, teaching about biofuels to schools, local groups, and media outlets, and developing an easier way to filter vegetable oil along the way, I realized that the world was in need of a go-to place to learn about and to choose smart green solutions. This is why in 2005 I started OrganicMechanic.com, where you can find innovative green technologies, useful information, and friendly support, to help you save money on electricity and fuel. Benefits of green energy also include increasing your energy security, supporting localization, and reducing your carbon footprint.

Earth Day 2006: Bus in Corpus Christi.

Earth Tribe on the Bus.

Photos courtesy of Christopher Kindig

Greasing the Wheels

Before the green business was the green bus. It all started with an adventurous crew, a dream to travel, and a full-sized school bus converted to run on pure vegetable oil.

The five of us were college students in Corpus Christi, Texas who were looking for something exciting to be a part of. We all wanted to travel, and wondered if there was some way to reduce our fuel costs and emissions. After researching and finding out that Rudolf Diesel himself originally advocated vegetable oil to fuel his engine, we decided to pick up a bus from an auction. We then found and worked with a conversion company to install a heated fuel system that would allow us to fuel our journeys with used cooking oil filtered from restaurants.

Earth Tribe became our group name, as we found shared interest in alternative energy, healthy living, and cooperative culture. We decided to launch a campaign to create awareness and support. "Healthy Individual, Healthy Community, Healthy Planet." We developed talking points and gave speeches to local environmental and political organizations, set up demonstrations at Earth Day, and presented at schools from K through College. We organized multiple media appearances, and had a party to raise funds for a great voyage across the country in the veggie-powered bus. Our enthusiasm was well received, and people were amazed learning about how minor vehicle adjustments could provide us with new energy sources today.

Over a few years of off-and-on trips, the bus saw over 20,000 miles of countryside and tight city streets, thanks mostly to recycled grease as fuel. Traveling on biofuels was not always a breeze, however. We did experience multiple breakdowns, and eventually became aware of how poorly constructed and installed our original vegetable oil system was. Far too many times we were stranded on the side of the highway, and in between the thunderous rumbling from trucks storming by, I was dreaming of how an ideal system would operate.

In addition to those trying issues, we also ran into a lot of hassle with collecting and filtering oil, at least at first. Anyone experienced in this will be able to reflect that while you can get it down to a science, it can be a messy learning curve—especially when you are collecting hundreds of gallons at a time for a bus. Waking up every few hours throughout the night to squirt a few more gallons of oil into a sock filter over a barrel was not only annoying, inefficient, and giving me weird dreams, it was also too expensive, and so there just had to be another way.

I started to research and developed an inline filtration system called the GreaseBeast. My business and life partner of that era, Dani Phoenix, now cofounder of the sustainability and education focused nonprofit D.r.e.e.m. Reality (DreemReality.org), took care of the customers, accounting, and taxes, while I guided strategy, improved the technology and access to suppliers, built the online marketing, and assembled filtration equipment in the rooms off of the kitchen.

We both did our share of packaging and hauling giant boxes in shopping carts to the post office. It involved a great deal of literal sweat investment and on-the-go learning, while we also went to school full-time for much of it. Through all of that, I found it very rewarding to run a company that was helping people to get free from the fuel matrix.

Over the years, working with friends and engineers I also designed a diesel conversion kit which solves some of the most challenging issues we faced on the bus. This system knows when to switch between fuels, tells you when to change fuel filters, lets you know if there is water in the fuel, and gives you a reminder to purge the fuel system on diesel fuel when you shut down. You can find these on OrganicMechanic.com/diesel-conversion-kit/ and the Support Manager Bob Karl can help you with any questions about how to convert, and how to find and filter oil.

We eventually decided to sell the bus, as new life chapters presented themselves. I cleaned and tuned her up very nicely, reminiscing all the while, and a beautiful synchronicity occurred when a group of five soon-to-graduate high school students from North Carolina found the veggie bus ad online. It was an opportunity for their dreams of a lifetime to come true, so they became the new caretakers, and the Legend of La Fonda Olive continues on the road today!

—C.K.

If you go to the OM website you can sign up to receive a free guide called "Ways to Go Green" that provides the most high impact ways you can get a grasp on and cut your energy costs. You can also find biofuel equipment, electric bicycles, electric car conversion guides, solar and wind power, efficient heating and cooling, home and vehicle efficiency devices, and more.

Starting Organic Mechanic also addressed a conflict in myself between my passions for the environment and self-sufficiency on the one hand, and my natural interest and inclination for entrepreneurship, marketing, and business on the other. I have grown to see business as a tool, which like any tool can be abused, but which also can be applied constructively to change the world for the better. I am in a similar position now as the Business Manager for FIC, where I am applying business insights to make the organization more sustainable and effective, so that we may support and spread the communities movement even further.

Original Earth Tribe Bus crew.

Green businesses, also referred to as B Corps and the like, as with many nonprofit organizations, take into account the so called "externalities" that business-as-usual has ignored. The new bottom line measures not only profit, but purpose, including the real impacts on people and the planet. A responsible business or organization, and those running it, realize this truth and decide to be part of that better world.

We Can Change This

"To change something, build a new model that makes the existing model obsolete."
—Richard Buckminster Fuller

To face the climate's change we could sure use a culture change. Companies and industries that are poisoning the earth should be held accountable for their poor decisions. It will also take better representation in government to help to set a greener course, and enterprising individuals in nonprofits and businesses to pull people together. Ultimately individuals must seek more responsibility to pay attention to and take care of the world around them.


Baltimore rooftop garden.

As harsh as it can be to realize the problems the world is facing, I hope that more people will go through the realization. It is better than ignorance or denial, and it raises hope that it could yield some positive response, for that person and their community, and also for the world at large.

As Greensburg, Kansas showed us (see the movie *Within Reach* or look online for more of that story), people can do breathtakingly incredible and imaginative things when joining together in the face of disaster. If we can show this same tenacity of unity, shared purpose, and creativity to reimagine the way things could be, even before there are disasters to face, we can do nearly anything.

Humanity has been short-sighted in its use of dirty fuels. It turns out that the high energy stuff in the ground was in fact too good to be true. We are collectively awakening to this reality, and to the potential consequences of continued inaction in the not-so-distant future. Will we work together to formulate a strategy big enough to match the challenge?

This has become the new human story. We must learn (remember) to love each other, in order to work together. We must learn (remember) to love our planet, in order to keep it.

Christopher Kindig grew up near and now lives in Baltimore, Maryland. Christopher majored in Psychology at Texas A&M, and founded a green technology company, OrganicMechanic.com, in 2005. He now also serves as the Advertising and Business Manager of the Fellowship for Intentional Community, and is a Sales Representative for Baltimore's first online farmers market by delivery, RelayFoods.com. Christopher loves growing, cooking, and eating fresh food, traveling, yoga, hiking, nature, good people, intellectual inquiry, stimulating conversation, and long walks, especially with his partner.

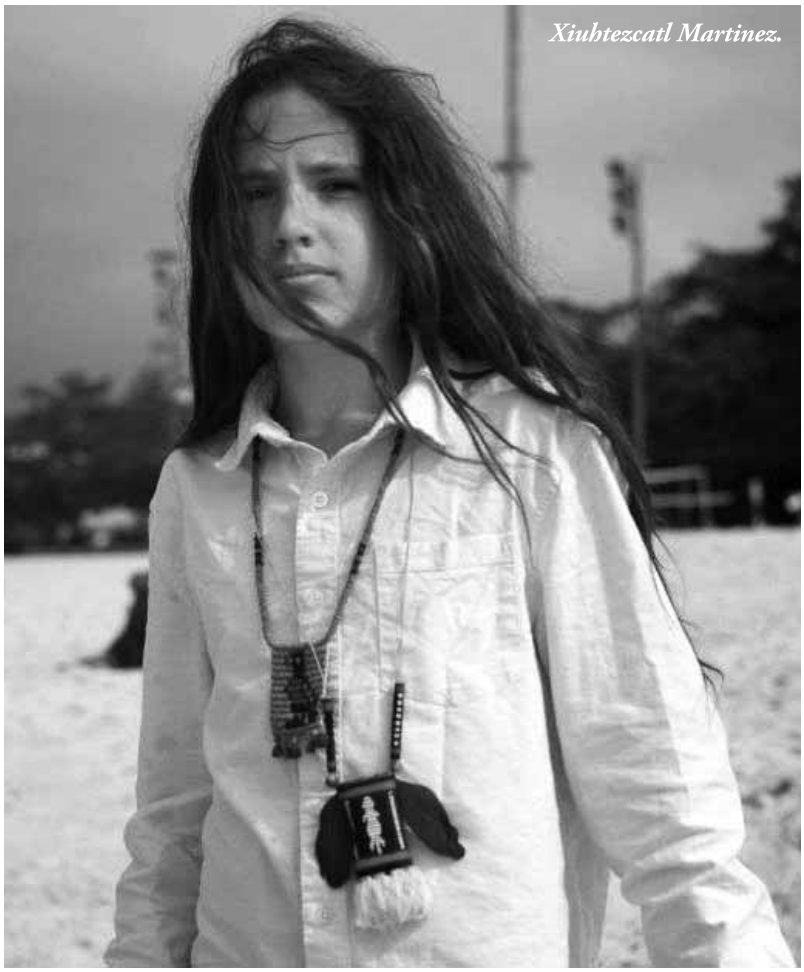
Sustainability Is a Life Style Not a Solar Panel

By Xiuhtezcatl Martinez

My name is Xiuhtezcatl Martinez and I am a 13-year-old Indigenous Environmental Activist. I have been speaking out about our environmental and climate crisis since I was six years old. I am the executive youth director of a nonprofit organization called Earth Guardians. We are committed to protecting the Earth, the water, the air, and the future of the children. Through Earth Guardians I am working to mobilize my generation, the "Change Generation," to work together on behalf of leaving a healthy, just, sustainable world for ours and future generations. We now have Earth Guardian hubs all over the globe and our movement is growing.

I live in Boulder, Colorado, and in the last week I have been personally experiencing the extremes of our changing climate with severe flooding because of crazy weather patterns above our state. NOAA, our scientific center that sits up on the mountain above Boulder, reported that the storm we have been experiencing could be a 500 or 1000 year storm because this much rainfall in this short of a period has never been recorded in the history of Colorado. They shared an image from space that showed an unusual weather pattern above our state that was spiraling in two different directions, one pulling moisture from the Gulf Coast and the other pulling moisture from up North, colliding into this fierce storm we are now experiencing.

Seeing the magnitude, the destruction, the death and the damage from this unusual storm is a clear indication that something is off balance with our changing world, because of our changing climate!



Xiuhtezcatl Martinez.

Some people think Climate Change is something that is far away on the other side of the world, but truthfully it is something that is in all of our back yards! People don't see that we are all connected and that what happens far away in the world affects us all because we all share the same Earth. As our climate continues to warm and glaciers melt at unprecedented rates, oceans are acidifying and rising, small islands are starting to disappear, weather patterns are changing, and many of us just go on and on, blind to the future we are creating and leaving for future children.

A lot of people relate sustainability to things like alternative energy, solar panels, wind turbines, and geothermal, but I believe that true sustainability is the way we live our lives each and every day. It is a way of life.

We have to change our life styles so we are not relying so much on any source of energy. We have to change the fundamental beliefs of our entire society and shift towards a life style of simplicity where we don't need as many material things, the biggest house, and more than one car to feel successful. This mindset has put us in the greatest man-made disaster in human history—our ecological and climate crisis. One of the biggest problems is that our generation is being taught to live the same way and make the same

The TRUST Campaign

I try to live my life as an example for others by making conscious decisions that are best for the planet, but I am only one person and I don't have all the answers. What matters most is our collective and cumulative impact. This is why the government's Public Trust obligation—to protect vital natural resources on behalf of citizens and future generations—is so important. We truly need government to help us know what our collective impact is and what limits need to be placed on that impact, and to help us find alternatives to carbon sources of energy and transportation. We can try hard as individuals to do this guesswork, but we really need guidance about our collective responsibility, and that must come from government fulfilling its Public Trust obligation. That's why youth who will inherit this world are asking government to step up and do its job by protecting natural resources that we depend on for our survival and health.

In October 2013, youth from across the US filed their legal briefs in the DC Circuit Court of Appeals, demanding the federal appeals court issue a decision upholding our rights to a safe atmosphere under the Constitution and allowing us to get a science-based climate recovery plan from the Obama Administration. And here in Colorado, I'm holding my state government responsible by submitting a petition for rulemaking that asks Colorado to take action on fracking. The legal actions youth are taking across the country are part of the TRUST Campaign and are possible only because of the work of Our Children's Trust. This great nonprofit organization is leading the TRUST Campaign and supporting young people like me to stand up for our rights to a livable planet. Please check out ourchildrenstrust.org to learn more about the campaign and to support the continuation of this important work by making a donation.

—X.M.

mistakes. We aren't being educated to walk lightly and respect the Earth. Our disconnection from the Earth and our life styles are destroying our own life support systems.

Clean renewable energy is a great alternative to fossil fuels but as long as we continue with the same mindset of taking more and more we are always going to need more and more energy whether it comes from sustainable energy sources or fossil fuels. Something many people don't think about is the amount of resources it will take, and the destruction it will cause, to put a sustainable energy infrastructure into place. By building more solar panels, wind turbines, and geothermal plants, we will still be taking more from the Earth than we are giving back! We can not continue living life as if there are endless resources.

Many people are waking up and realizing this crisis that we are in, but is it enough and will it be in time? Youth are rising up all over the planet to meet the challenges we face as the next generation that will inherit this beautiful planet. We have the power to inspire and create a movement towards building a sustainable, healthy, and just world. Together we can change the fundamental beliefs of our entire society and learn to live more lightly on our sacred earth.

Xiuhtezcatl Martinez came into the world through the Aztec culture on his father's side, and environmental activism on his mother's side. As the youth director of Earth Guardians (www.EarthGuardians.org; www.facebook.com/pages/EarthGuardians/113066278734489?ref=hl), Xiuhtezcatl has organized many rallies, actions, demonstrations, and events, and has spoken globally on many issues. Xiuhtezcatl has worked with Boulder City Council members, County Commissioners, Senators, and Congresspeople, and has collaborated with over 50 environmental organizations. He has led and participated in many victories including getting pesticides out of Boulder's city parks, achieving a fee for plastic bags, and containment of coal ash. He is currently working on helping fight for a statewide ban on fracking. Xiuhtezcatl was one of the youngest speakers at the Rio+20 United Nations Summit in Rio Brazil in June 2012. Contact him at Xiuhtezcatl@EarthGuardians.org.

Xiuhtezcatl with White House Staff.

Photos courtesy of Xiuhtezcatl Martinez

Power to the People:

T'Sou-ke Nation's Community Energy Solutions

By Andrew Moore

T'Sou-ke Nation, located on the west coast of Vancouver Island, British Columbia, overlooking the Pacific Ocean, is one of the most solar-intensive communities in Canada. T'Sou-ke has a 75 kW solar photovoltaic array laid out in three demonstration projects, as well as half of the nation's 90 houses so far installed with solar hot water systems. More significantly, members of every house, office, and community building are actively engaged in a comprehensive energy conservation program. In recognition of T'Sou-ke being in the vanguard of the renewable energy movement and the drive to "Net Zero" energy, the band has just been awarded Solar City status (a community producing more energy than it uses) by the Canadian Solar City Program.

For T'Sou-ke this has been a very interesting journey with many lessons learned on the way. The project cycle from vision to implementation to feedback continues today as the community takes on more ambitious energy projects in partnership with governments, universities, and other First Nations.

It All Started with a Community Vision

T'Sou-ke Solar Community started with a vision in early 2008, a vision that developed from an intensive year-long Comprehensive Community Planning process that engaged the whole 250 member community including all the children. The guiding principles for this planning were based on traditional values such as the Law of the Iroquois—"In every decision we make we must understand the effects on the seventh generation." Not many people or organisations plan 100 years ahead; when T'Sou-ke did, they knew that they needed to get certain priorities started now if they were to achieve sustainability once more. T'Sou-ke believes that the only people who have ever lived sustainably for any amount of time on the North American continent have been the First Nations, some tribes for thousands of years. It was a matter of going back to those early values, such as a deep respect for Mother Earth, which indicated the way forward. Along with Food Security, Economic Self-Sufficiency, and Cultural Renaissance, Energy

Chief standing on solar roof.

Autonomy became a priority project to implement immediately.

Implementation Strategy

T'Sou-ke got off to a heady start when they won a competition for funding held by BC Ministry of Energy's Innovative Clean Energy Fund. T'Sou-ke was granted $400,000 towards its energy project.

This quickly enabled the band to leverage further public and private funding to a total of $1,250,000 towards a large photovoltaic (PV) installation which creates electricity from the sun, solar hot water (SHW) installations which preheat water with solar radiation, and a massive energy conservation program. From the inception the community knew it must take ownership of the project: both in being 100 percent legal, financial owners and in knowing how the technology works and how to maintain it. To this end, when requesting contractors to tender for the installation, they were told that their submissions would be looked on favourably if they included training and employment of at least 10 community members during the installations. This strategy has worked exceptionally well. T'Sou-ke has 10 CanSIA (Canadian Solar Installers Association) certified installers and excellent long-term relationships with some of the contractors that now includes collaborations on further projects across Canada.

The Project

T'Sou-ke Nation saw this opportunity as a chance to meet its own affordable power needs and also to demonstrate how renewable energy can support other First Nations as well as the wider society. The band installed three different PV systems worth over $900,000, 40 solar hot water systems on individual houses and the Band Hall, and implemented a comprehensive energy conservation program.

T'Sou-ke trainees getting certificates from BC Minister Of Energy.

Photovoltaic Installations

1. A "Net Zero" installation which is designed to ensure that all T'Sou-ke's administration buildings produce as much electricity as they use over the period of a year. T'Sou-ke sells surplus solar electricity in the summer to the utility BC Hydro and buys it back in the winter. This is facilitated by BC Hydro's "Net Metering" agreement. Over the whole year the band's electricity bill was designed to be zero. The band slightly over-designed the PV installation so they get cheques from BC Hydro to account for the surplus and for conservation of energy measures carried out since.

2. An "Off Grid" installation simulating a solution for the 30-plus BC First Nations not connected to BC Hydro who rely on very expensive, unhealthy, greenhouse-gas-producing diesel generators. When facing diesel costs of up to $1/kW for remote communities, replacing some of the generators with solar PV already starts to make a lot of sense, financially and environmentally.

3. A large "Feed In" installation on the back of the canoe shed sells clean solar energy to BC Hydro through a "Feed In Tariff" for the next 100 years. In 2009, when it was completed, it made sense financially only because of T'Sou-ke's substantial grant funding. However with prices of PV panels having dropped 70 percent since 2009, and BC Hydro prices having increased by 45 percent, it will not be long before there is parity between PV return on investment costs (ROI) and BC Hydro prices.

Solar Hot Water Installations

Ten members of the community were trained in solar hot water installations, and supported the contractors in placing systems in half the houses on reserve and in the community kitchen of the Band Hall. This part of the project had a huge setback when the contractors went bankrupt halfway through the installations. Although the contractors had come highly recommended by the Federal Government, which was channelling special energy saving incentives through them, the program collapsed with the contractors owing the band over $100,000. Through the skills of the membership and support of local solar industry, T'Sou-ke managed to save the project and complete the installations and address many maintenance issues that have arisen since. Community-trained installers

Chief viewing the solar installation.

became excellent at doing diagnostic work—they soon saw the issue as a challenge not a problem. One elder complained at her birthday party that instead of talking about her, all her relatives could talk about were the possible solutions to some of the solar hot water installations they were involved with.

Energy Conservation Program

T'Sou-ke will often say that they implemented their energy project backwards.

It was at the point when the PV and SHW installation were almost complete that the whole community spontaneously realised that it must save this precious clean energy from literally going out of the window. T'Sou-ke had fulfilled the supply side part of the energy equation but should have first addressed the demand side. Community members who had trained and worked on the project and homeowners beginning to benefit financially from the interventions realised that they must all change their habits and put a huge effort into conserving energy. T'Sou-ke found that it can cost a tenth of the price to save the same amount of energy as it does to produce it.

Every house installed an (ESK) Energy Saving Kit that included energy saving light bulbs, low flow shower heads, weather stripping, and hot water pipe insulation. They also received extra insulation in roof spaces and in some cases new appliances to replace obsolete ones, e.g. refrigerators, through an (ECAP) Energy Conservation Assistance Program.

Since the completion of the solar installation T'Sou-ke has focused on an extensive conservation information, education, and implementation program. What T'Sou-ke at first thought would be a hard sell is being embraced by everyone on the reserve and particularly by the children, to the extent that its whole program is being led by the youth-inspired T'Sou-ke Smart Energy Group (TSEG).

Energy Autonomy Promotion, Education, and Ecotourism

One of the remarkable offshoots of this project is that T'Sou-ke has unexpectedly created a whole new Ecotourism program. T'Sou-ke had no idea when they initiated the project that the PV installation alone would be twice as big as any other PV project in British Columbia. On completion of the solar installations in July 2009, T'Sou-ke invited all levels of government and First Nations of BC to a weekend gathering with much dancing and drumming, solar tours, and workshops.

The party has never stopped. This year alone T'Sou-ke has had 32 schools, 54 municipalities, and scores of tourists from all over the world come for tours and workshops. Whole BC Ministries will come for day trips, particularly if T'Sou-ke is providing Bar B Q salmon from their fishing boats and salads from their greenhouses.

A fortuitous meeting took place at the opening gathering with a local councillor from a neighbouring municipality. She asked why we (all local governments across BC) were not doing this same thing, and would T'Sou-ke enter into a partnership with her municipality to bring the concept and technology to their community. Within a year we had an offer of a $3.9M grant from Federal

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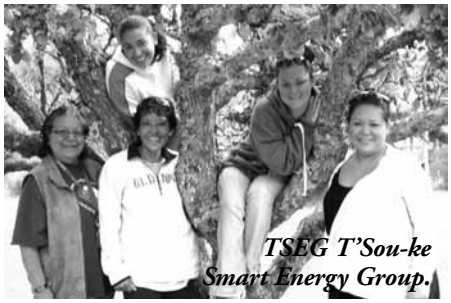
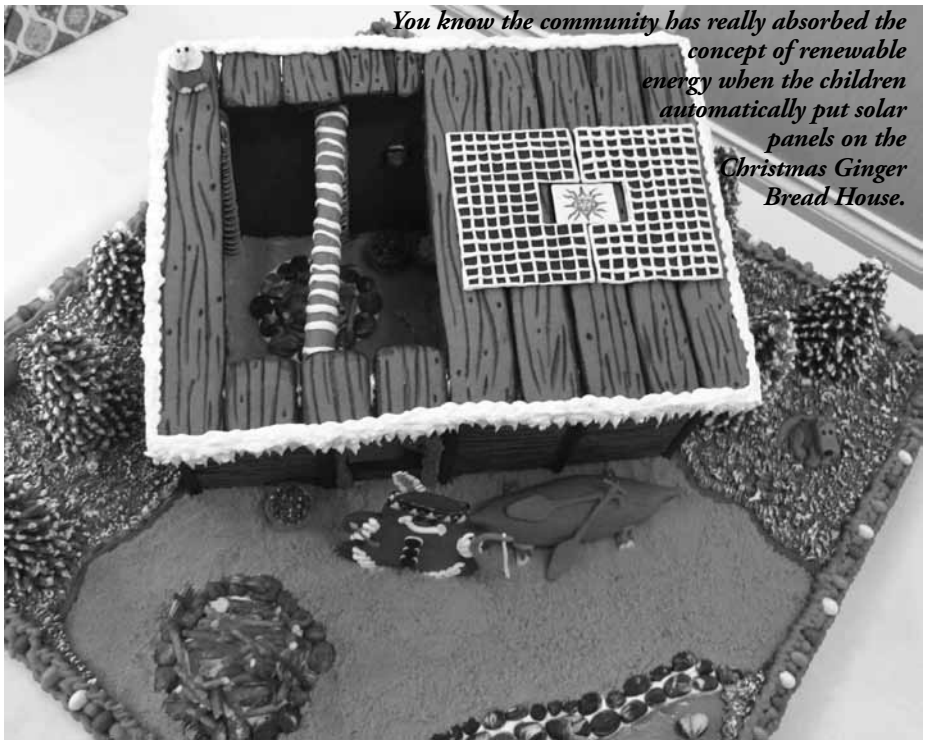


TSEG T'Sou-ke Smart Energy Group.

T'Sou-ke trainees on solar roof.



You know the community has really absorbed the concept of renewable energy when the children automatically put solar panels on the Christmas Ginger Bread House.

Generating Your Own Electricity: WHY AND HOW

By Mary Wildfire

Every community should have some kind of renewable power generation system. **Why?** Well, first, if yours is an ecovillage, having your own non-fossil-fueled power source enables your community to practice what you preach; it enables you to be a model of green living for the larger community surrounding you. It enables you to stop contributing to such crimes against posterity as the burning of coal, the drilling and fracking of shale gas, and the splitting of atoms.

Second, it gives you security. There's reason to believe that the grid will go down more and more often for longer periods, and/or get unaffordably expensive; setting up your own system now is a wise investment if you take the long-term savings into account. Depending how the converging crises of oil depletion, climate change, and corporate control of governments play out, some of those who keep waiting for solar, wind, or water power to get cheaper than grid power may find themselves making do with no electricity at all.

How? Making the conversion from grid power to producing your own involves research and choices. The first step is to determine what your current energy expenditures are, and look for ways to reduce them. A cheap and handy tool is the Kill-a-Watt (about $25), which plugs into a wall socket; you plug appliances into it, and it tells you how much power is being used. Your big energy hogs may not be the ones you think!

Also research what subsidies are available. There is a federal tax credit of 30 percent of costs, which may be rolled over into subsequent years if your tax liability is less than the credit. Many states also have tax credits or others subsidies; check www.dsireusa.org.

The third thing to research is which source of power your land best supports: Is there constant wind? Do you have a reliable stream with at least 10 feet of drop across your property? How about a good exposure to the south, without shading? Sometimes a hybrid system works best, if your stream or wind becomes weak in summer but that's when you get the most sun.

You also need to find the best spot for your panels, windmill, or water turbine. Often, solar panels are better mounted in the yard rather than on a roof: they work more efficiently in cooler, even cold, temperatures, and roofs build up heat. Also, it's easier to sweep snow off panels in a yard than to hang out a window in January to do it. But the roof may be a more secure location, especially in a city.

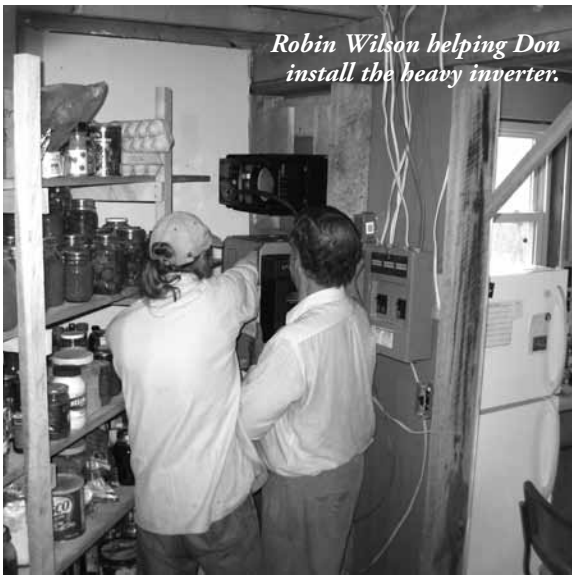
A key choice is whether to arrange an off-grid system or a grid-tied one. An off-grid system gives you independence—if the grid goes down, you are unaffected. But that's because you have batteries and a charge controller; with a grid-tied system you can save the cost of these things, using the grid itself as your battery. Given the arguments under "Why," you can see why my husband Don and I chose to go off-grid. But the other couple here, the Wilsons, are perhaps less paranoid, and more inclined to want to be part of a larger solution, so they chose a grid-tied system. As our community makes most decisions at the household level, we didn't need to agree on this. And it's worked out well making different choices because we have a line connecting the two houses—our own microgrid! Thus, when we go a week with no sun at all in winter, my household can take a kilowatt-hour or two from the grid, from the Wilsons'

house. When the derecho came through in June 2012 and knocked out power, and the Wilsons' system went down as a result, we sent power the other way to keep their freezer going. Additional sharing may be possible when we find people for the other two leaseholds. Larger communities could also benefit from trading power in another way: between wind in the high places, water power in the lower places, and sun wherever the shade isn't. Some communities could use the money provided by high-earning members, while others with technical proficiency figure out the system, and anyone with time helps install it.

My husband figured out how to set up our system, then assisted the Wilsons with their grid-tied version, and then helped two other households in the larger community set up their own systems. He also created a website to share information about some of the technical tricks: find it at www.spectrumz.com, the Going Solar blog (there is also a link to "Hickory Ridge housing project," which is a slide-show of how we built our energy-efficient house).

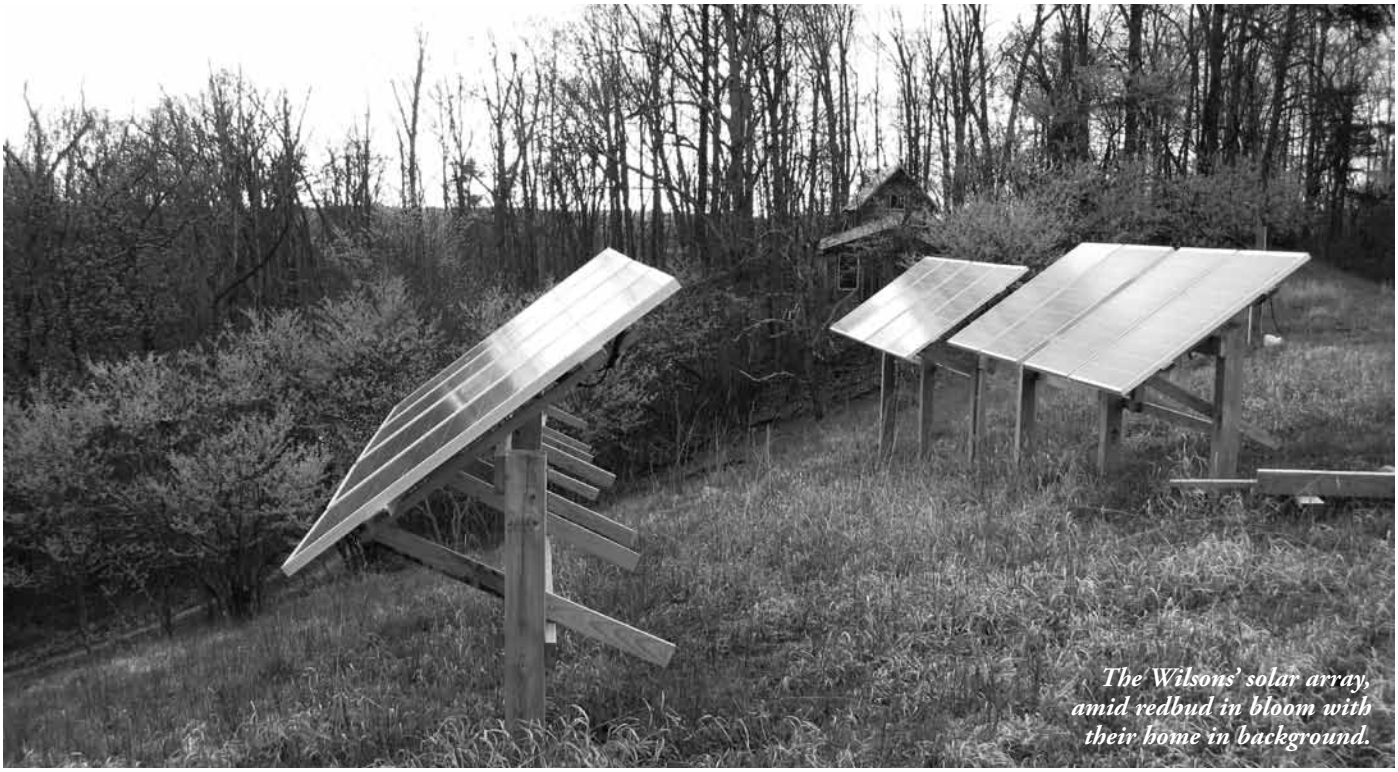
We strive to live sustainably at Hickory Ridge in many ways. We have composting toilets, large gardens and orchards, rain barrels, and we're exploring permaculture ideas and grafting nut trees. But all those ways of recycling materials and energy are low-tech projects that can be added and worked with any time, as long as you have land and a few hand tools. Producing your own electricity is different. That's why I urge everyone to make it a priority, because the high-tech civilization that makes setting up such a system fairly easy now may not last. My household may use only a tenth of the electricity that the average US household does—but I'd sure miss it, if we didn't have that three kilowatt-hours or so a day!

Mary Wildfire is a writer, activist, and gardener, living on a ridge in West Virginia. She is part of Hickory Ridge Land Trust. She admits to being a hippie and a tree smoocher, kind of a pinko, who believes subversion to be the highest calling.



Robin Wilson helping Don install the heavy inverter.

Close-up of treated wood framework for panels—easily adjustable for seasonal tilt.



The Wilsons' solar array, amid redbud in bloom with their home in background.

Mary Wildfire

GOING FOR THE GRID:
A Community Ditches Energy Independence to Get Greener

By Sarah Stoner

Five years ago, the community and I had just started our courtship. My family and I—husband and two young children—still lived among the bright lights of the city.

A few months into "dating"—which meant living on the 20-acre community land trust part-time each week during the membership process—the annual May Day Celebration rolled around. We had all just come off the typical long gray Washington winter. Our 10 adult members, gaggle of children, friends, neighbors gathered together in the sunshine. We danced barefoot in the cool grass, ate from the table spread with food and spring flowers. The band played under the cedar tree laced with tiny white lights—each powered by the solar panels just beyond the meadow. I turned my face up to the sun and let the lively beat wash over me. Sunshine converted to sound. It was like magic. I was in love.

Fast-forward to October—it's the start of our first full winter at Walker Creek living off-the-grid. The kids aren't asleep yet—our power keeps cutting out and they want their bedside Turtle Light to sleep. They are freaking out. I'm on a deadline. My laptop is sucking too much power from our back-up battery bank, but I need to finish the newsletter I am on contract to produce for a nonprofit in Florida, and it's too late to drive 25 minutes into town to the nearest coffee shop. Everything's closed. I am freaking out. My husband Ken is outside starting the backup generator—again. The lights turn on. The generator should be charging our eight deep-cycle batteries stored in the barn but it's not. The lights go out. The baby starts crying. Should I nurse Katey or stoke the fire? If I don't tend the fire right now I'll have to re-start it, the idea of which adds to my stress level, not to mention that Ken's out of earshot troubleshooting the generator and the kids won't be left alone in a dark house. I throw the little one on my hip and pull my rain jacket over her body and grimace as I hear my five-year-old wail to keep up through the slick mud. I grab two pieces of wood by the barn with my one free hand. I'm panting with anxiety.

So much for the simple life.

I'd visited friends in Colorado who power their house with the sun. They live against the backdrop of the Sangré de Cristo Mountains with a sun that beats down year-round. Other than that visit, I didn't have prior experience living with solar power. Even then, I noticed how often they stopped to look at the power meter panels. I didn't understand. Wasn't energy from the sun free? Unlimited? Abundant?

Isn't being able to generate your own energy, to be self-sufficient in terms of your power needs—as Walker Creek has been for more than 30 years—the ideal?

After a grand three-decade experiment in energy independence, Walker Creek Community has first-hand experience with two major misconceptions of off-grid living: that it's a romantic simpler choice involving homemade beeswax candles, self-sufficiency, life in the slow lane; and that it's a better environmental choice. We've learned as we've lived off-the-grid that in our case—it's not.

"I never encourage people to choose off-the-grid if they have utility power available," explains Alana Nelson, co-owner of Fire Mountain Solar, and part of the husband-wife team who led the joint effort to bring utility power up Periwinkle Lane—to the four

households of our community, to the solar well-pump that provides water to our entire community, and to the two neighboring households who share an easement on our mile-plus dirt lane.

Tim and Alana Nelson have lived as neighbors to Walker Creek Community going on 15 years, ever since building their strawbale home up the hill from the community. The Nelsons' solar energy business grew out of living here on this land, off-the-grid. Alana explains that there are definitely appropriate situations for being off-the-grid. Among them: when it's so remote, like a cabin in the wilderness, that utility power is not an option; and when the cost to bring utilities to your home is so prohibitive—one of their clients was quoted $250,000 to run utilities a mile up their road—that an alternative-energy system is a smarter investment.

The houses that line the paved road to our lane have electricity, we live not 10 minutes from a vast hillside housing development, and beyond our fence we can see the 120-foot tall power lines rising above the cedar grove. The lines buzz like 1000 angry bees in deep winter when more humidity wets the air. Some days, we mock them with the smooth silver solar panels that sit on our roof. Other days, they mock us as we run outside to start our generator, bracing against the cold air.

In the late '70s and early '80s, just after the folks living at Walker Creek collectively donated the 20-acre property to the Evergreen Land Trust, a clear vision was already at hand. Walker Creek trust agreements articulate the commitment to be "an experimental ground for alternative technologies." Wind, water, and solar energy have all been a part of that experiment.

Today's members of Walker Creek are similarly committed. As established public school teachers, business owners, and tech freelancers who grow their own food and steward land cooperatively, members straddle the wide ground between back-to-the-landers and career professionals. Within this dichotomy Walker Creek also serves as an experimental ground for how the common US lifestyle—complete with computers, cars, and busy calendars—can co-exist with alternative energy choices.

Community member Aviathar Pemberton has made his home at Walker Creek Community for 28 years. He raised his three children here, off-the-grid, from babyhood to teenager-hood to young adulthood. Aviathar's evolution with alternative power ranges from candles to kerosene lanterns that smoked up the inside of his house to propane lights to electric automotive lights (like your tail lights) which he'd keep charged by running his car every few hours. Eventually he bought two solar panels to charge the set of deep-cycle batteries which charged the small 12 volt electric lights.

Around 1995, Aviathar, who also goes by V, began the process of adding more and more panels to his solar array, slowly converting his household to LED lights (which had just come out), building up a bank of back-up batteries, and investing in propane-run generators for our Northwest winters when there simply aren't enough daylight hours—or sunshine—to produce a reliable amount of power.

Solar panels and tree branches blanketed with snow at Walker Creek Community.

The Good, The Bad, and The Ugly

With simple doable new habits around energy use—not leaving appliances plugged in, using power strips, mastering the art of making toast on

the stovetop—our adjustment to living off-the-grid was surprising. Many days, our family hardly noticed the difference. Most days, I appreciate the forced consciousness around electricity, the small shifts in awareness, the ingenuity born from constraints. Who needs a document shredder when you have a fireplace for central heating? Who needs those kitchen appliances cluttering your counters when you can do it by hand? Can we figure out as a community how to build a root cellar in that hillside? There's something deeply satisfying about figuring out ways of doing things that you know have been done for hundreds of years before whirring, buzzing appliances with flashing digital displays came along.

And really, who wouldn't love the power of self-reliance—of learning how to meet your own energy needs? Winter storm power outages leave you utterly unaffected. Making your own electricity: it is magic.

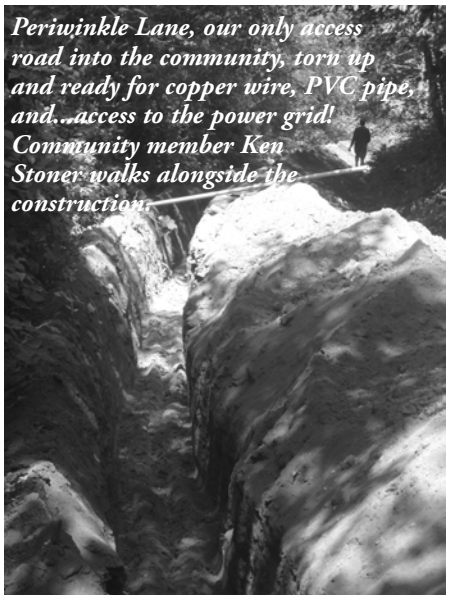
The rewards of an off-grid system don't always come easy. We had warnings. As prospective members, we were told, "Some weeks, keeping the lights on and the water running and the house warm is a full-time job." But like when you're on the cusp of marriage and people tell you, "Marriage is hard work," sure, you hear them. But how hard can hard be? Only later, once you are in the daily, yearly unrelenting throes of your lights going out in the middle of cooking dinner, or as you walk at 6 a.m., again, through a pitch black winter morning shivering in pajamas and a coat across the creek to start the well pump generator for your shower before work—only then do you know.

I've tried to come up with a way to explain—more than "it's hard." And the best metaphor I can think of is this: visualize that energy-conscious person, like maybe you are, like the one I've always been, who turns off the lights when she leaves a room, even at the office; who turns off the tap when she brushes her teeth. Now picture a woman in Uganda, hauling a bucket of water. How does your relationship to that water change if you are her? How do your choices change when you only have one bucket? That finite amount is a far cry from water in the tap that you can treat with care—and that you can turn on at any time. That "bucket of water" is your electricity for the day when you live off-the-grid. It's an entirely different relationship.

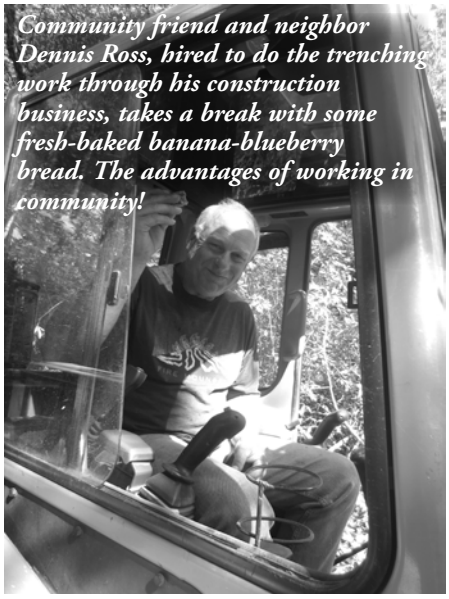
Off-grid solar panels generate electricity, to use and to store to your bank of batteries. When there's no sunshine, you pull from the finite electricity stored in your batteries. So when it's cloudy or nearing nighttime, you have to consider what's left in your batteries, and how it fits with your plans—you might want to get some late night work done on your computer while your kids watch a movie. You can either make different energy choices, or turn on your generator to recharge your batteries enough to get through the night. Or you can choose to wait for enough sun to recharge your batteries, which may be tomorrow around 9 a.m., or...not. It could be cloudy.

"The batteries are the weakest part of an off-grid system," explains my husband Ken. Think of how your laptop or cell phone battery eventually holds less and less of a charge. Solar bank batteries do the same thing. And they have to be babied—bathed regularly in distilled not regular water. They can't get too cold. Even then, at $250 a pop, they need regular replacing. One bad battery can take your entire system down.

No doubt about it, living off-the-grid limits choices. Some you'd expect, others you might not. When your neighbor who raises grass-fed cattle offers up the chance to purchase a cow or half a cow from her, none of you have a freezer (electric) to store it. When you buy your Excalibur food dehydrator for the autumn abundance of apples and Asian pears and plums, you realize your house doesn't have the power to run it for the 24 hours it takes. So you store the dehydrator at your mother's house who lives an hour south in Seattle. It's an added bonus to work together on a big food project—and it also takes scheduling a drive down, kid logistics, hauling all the fruit to and fro, and getting to all this before the fruit rots. Each decision that affects off-grid power use adds up to a bigger picture layered with dubious environmental decisions and lots of logistics. So much for the simpler life!

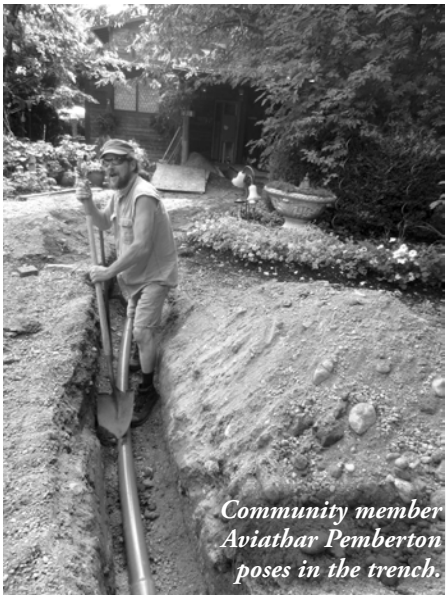


Periwinkle Lane, our only access road into the community, torn up and ready for copper wire, PVC pipe, and...access to the power grid! Community member Ken Stoner walks alongside the construction.



Community friend and neighbor Dennis Ross, hired to do the trenching work through his construction business, takes a break with some fresh-baked banana-blueberry bread. The advantages of working in community!

Photos courtesy of Sarah Stoner



Community member Aviathar Pemberton poses in the trench.

Community members Aviathar Pemberton, Ken Stoner, and daughter Katey lay pipe and mark lines for the trench to be dug for the electrical wire. The electrical panel at the author's house sits on the between their straw bale barn and their propane generator.

What's the big deal anyhow, to just run the generator whenever you need power? Walk with me for a moment, through this glorious forest of ours filled with native hemlocks and salmonberries, cougar and coyote, filled with shiny clean air that you breathe in as the forest breathes out. Walk through the cold winter air, clear as glass, under a sky held up by mossy trees. Now add in your polluting generator rumbling and roaring through the stillness. It really sucks.

Or maybe you sipped power today but your neighbor who makes and sells organic soap as a livelihood needs the extra power to finish up a batch. You get to hear her generator roar from across the creek. Polluting propane is a serious contradiction to living in nature.

Air pollution, noise pollution, and lifestyle constraints aside, the tipping point in our decision to join the grid was this: the opportunity to be a green-energy producer. "We spend all this money on a good off-grid power system and when the sun comes along and the system is at full capacity, there's this little switch that turns the panels off," explains V. "On summer days, our batteries are completely full by 11 a.m. After 11 a.m., that clean power goes to waste."

"Now we can capture all the excess energy that we weren't able to store in our battery banks in the summer time when the sun is shining in abundance and we can let someone else down the line use it," says Alana.

What Do We Stand For Now?

A few weeks ago, on one of our several "electricity work weekends," Ken and V along with another community member were discussing next steps. It was all sounding so serious. I wanted to add a little levity so, using my most syrupy New Age voice, I requested that we all hold hands in a circle and shout out the appliance we were most ready to invite into our lives.

"Toaster!"

"Hot tub!"

"Freezer!"

It's a brand new world in the woods of Walker Creek. How will we change, in terms of our energy consumption, now, with unlimited access to electricity?

Even with all the truths we've learned about the environmental costs, being able to declare that I live off-the-grid is a badge of honor hard to let go. What do we stand for, now that we can no longer declare as a community, "We are an example of off-the-grid living"—as we have for the last 30 years? "We are an example of a group of people with solar panels on our roofs" seems to lack the same punch.

What we *can* be is a net zero community. "With our solar panels we'll be able to bank enough credits in the spring and summer to get us through the winter," explains Alana.

But we won't be monitoring each other's household electricity bills, just like we've never monitored each other's propane bills when we were off-the-grid. At times, I was curious how we compared: households ranged from $40 to a whopping $250 a month in propane use.

Let's be clear that other folks might be able to pull it off better than we did—living off-the-grid, burning less propane—with fewer trees in the way, a larger solar array, a larger battery bank, and a larger budget. And here in the great Northwest, the bulk of our grid power is alternative energy: hydropower. For us, burning propane rather than using hydropower as a backup energy system for our solar array makes less sense. Take that same argument to the Midwest where the majority of grid power comes from burning fossil fuels—close to half of the US's electricity production comes from coal burning—and propane plus solar would be the better environmental choice.

Since our initial electricity meeting six months ago, we've not yet made time for

(continued on p. 75)

Burlington Cohousing's Excellent Solar Adventures

By Don Schramm

Cohousing in Burlington, Vermont had a long incubation period. We moved into Burlington Cohousing East Village in November 2007 after working towards it for 18 years. It felt like a Phoenix constantly arising from the ashes. Along the way we developed an in-depth mission statement that gave higher priority to affordable housing and engaged residents than to energy-efficiency and environmentally friendly power. While we tried to include passive solar, living roofs, tight and highly insulated structures, sustainable materials, and solar panels in our designs, our budget limited us to no living roofs and only conduits for future solar power. Since move-in, Burlington Electric Department and the State of Vermont have initiated a number of solar programs with incentives. As we have been weaving our way through our processes to get to a smaller environmental footprint, they have been stumbling their way through their processes as well.

East Village has enthusiastically embraced solar power after a number of skirmishes about private use of our common areas. Our physical community consists of a barn, two single family homes, 10 townhouses, a duplex, and 18 flats in the main building which also holds the common kitchen, dining room, living room, and guest bedrooms. All of these buildings have flat roofs except for the single family homes and our barn. We now have 175 solar panels providing 70 percent of our common use electricity and monthly credits on the electric bills of 11 of our 32 families. Of these panels, 83 are on the main building roof, 30 on the barn roof, 14 on one townhouse, and 16 each on three townhouse roofs. There are likely more solar panels to come and the issue of "private use of public areas" is still a hot one.

This issue grew gradually. When we moved into our newly built housing, we had exhausted our construction budget and there were many important features missing from our community. So the next two years we were busy repairing the 1940s barn that came with the land, building parking sheds, adding roof decks, creating guest rooms, furnishing the common kitchen, dining room, and living room, and many other smaller projects. We accomplished a great deal but at the same time glossed over some of the processes involved.

Burlington Cohousing Solar LLC members Charlotte, Barbara, Joan, and Don in front of some of the 113 panels that provide power to the community's common circuit.

Gail Holmes

In the fall of 2009, two different families requested permission to install solar panels on the townhouse roofs above their heads. Both were approved by the Owners Association. The first family sailed through the process but ended up lacking the financing. The second family met some objections—first from several people unhappy overlooking their solar panels and second from owners concerned that eventually the community as a whole may want to use that roof for general solar power. That project went forward with the stipulation that in case the community wants our general solar system to be combined with those on this single townhouse, the owner would add her panels to the plan at no extra cost to her. Soon afterward 14 solar panels went

up on her townhouse roof. This system used a single inverter and a set of storage batteries. Any power generated beyond what was used or could go into the batteries went out onto the electric grid.

At that stage our community began to confront conflicts that boiled down to individuals or families requesting some private use of public areas—in many cases roof space. A task force began brainstorming how to deal with such conflicts. There was unanimous agreement that the community as a whole owned all the buildings' "skins" and roofs. If we as a community agreed to use the space for everyone's benefit, there was no conflict. For example, we built a deck out over the third floor roof for community relaxation and gardens. That was a case of public use of public areas. When some families wanted to put air conditioner condensers on that deck then we had an issue. Those were eventually resolved by putting the condensers on the uppermost roof one story higher.

In August 2010 a consortium of three owners proposed installing 113 solar panels on the main roof and south barn roof. Other residents could have joined the consortium but chose not to. It would have been better if the Owners Association itself could have taken on this project but it did not qualify for the federal solar tax grants which was 30 percent of our total costs. So we formed the Burlington Cohousing Solar LLC which would finance and organize the project and sell the power to the Owners Association. Now the questions began to fly. Would the panels damage the roof and if so who would pay for the repairs? Would they be insured and who would pay for that? How much would the fourth floor residents be disturbed by the installation? Were we truly being ecologically responsible in buying solar panels manufactured in other countries using resources and energy to ship them? The Solar LLC followed the new procedures for "private use of public areas," answered all the questions thrown at them, and started the installation that Fall.

Conflicts boiled down to individuals or families requesting private use of public areas—in many cases roof space.

While this was a "private use" in the sense that three solar LLC partners would get a return on their investment, it appeared to be for the overall good of the entire community. The majority of our common electric power would now come from solar. Our electricity rate would remain stable. In fact it ultimately went down $2,000 a year because our lower power purchases dropped us into a lower rate category. The Owners Association has the option of buying out the investors at a set cost anytime after the first five years. Through this process our Solar LLC had the assistance of Community Energy Exchange, an L3C organization which facilitates the development of community energy projects in Vermont. They helped design the system, choose the installer, set up the LLC, and do the general administration. In return they were given a small ownership stake.

The installer, Vermont Solar LLC, suggested that we use micro-inverters on each panel rather than a couple of inverters for the entire system. With micro-inverters, a problem with one panel will not impact the total electrical output of the entire array. Also micro-inverters are connected to the internet and the status of any panel

Burlington Cohousing Solstice Party Parade June 22, 2013 in front of townhouses with 48 solar panels.

Don Schramm

can be assessed online. There were some risks to this approach because micro-inverters did not have an established track record. Many of them actually failed on our main roof before the manufacturer decided that we had a gotten a batch of lemons and had the installer swap them out for newer versions. That was a year ago and we have had no failures since. Unlike the first solar installation with a battery backup, this one simply used the electric grid for "storage."

During the installation, we had a misunderstanding. A couple of residents lost their parking spaces when the crane arrived. They were upset enough that the crane had to be sent back while we resolved the dispute by providing more information and apologizing profusely. We had neglected to keep our neighbors fully informed of the details of what was going to happen. There was some peripheral "heat" around the issue that our conflict resolution committee helped ameliorate. The 113 solar panels have now been in operation for almost three years and have produced about 90 megawatt hours of power equivalent to offsetting 62.2 tons of carbon.

With this amazing success, one would expect clear sailing with the next solar project. That was not to be the case. In the spring of 2012 Burlington Electric Department opened a new solar program—Group Net Metering. This program enabled any resident of Burlington to install solar panels anywhere within the City and get credit on their electric bill based on how much electricity was produced by their panels. Ten families in East Village decided to give this idea a go. We estimated that after applying the Vermont Solar Incentive and the Federal Tax Credits, our per panel cost would be about $800 and each panel would provide $50 to $55 of credit each year. Various families would be purchasing different numbers of panels based generally on how much electricity they used. Together we would be installing 48 panels on two or three townhouse roofs.

"Which roofs?" seemed to be the major question. There are three blocks of townhouses that could handle solar panels. The duplex could take 40 altogether. One five-townhouse block could take 80. The other could take 64. We asked the townhouse owners how they felt about solar panels going on the roofs above their heads. One said she could not afford solar panels now but was planning to install them on the roof above her in the future and did not want to lose this opportunity. Another said they wanted to put a stairway up to their roof and sunbathe on it. Interestingly this family was one of those purchasing solar panels. A third owner said that she did not want solar panels on her roof. Four owners were supportive of having solar panels on the roofs above them. No one claimed that they owned their "roof" but there was a strong feeling that they should have some say about what happened up there.

No one claimed that they owned their "roof" but many felt strongly they should have a say about what happened up there.

Underneath the question of "Which roofs" were deeper questions. When is it appropriate to allow the "private use" of our "public areas"? For what purposes would we allow "private use" and how do we decide? Our task force had worked out a thoughtful procedure for residents to follow when requesting their "private use of public areas" and that was helpful when some residents wanted to build a stone wall and others to put in various types of sunshades. But the procedure did not go far enough. In retrospect we began to realize that we should never have agreed to the earliest proposals from residents to install their own solar panels without fully developing a policy for the "private use of public areas." The large solar project went through relatively easily because everyone seem to benefit from it. It too should have waited for policy development.

We were getting close to the deadline for the Vermont Solar

Joan Knight

Burlington Cohousing residents making pies using mostly solar power.

Governor Shumlin staff

Solar Powering Up Ceremony August 24, 2011 with Vermont Governor Peter Shumlin, Burlington Mayor Bob Kiss, Liz Miller of Vermont's Public Service Department, Solar installer Kirk Herander, and some East Village cohousers.

Incentive, so we put off the full debate as to how we decide on what happens on our roofs. With three owners in one five-townhouse complex willing, we decided to put the panels there. We followed the "private use of public areas" procedures and got approval from the Owners Association to move forward with the installation with the stipulation that exactly which roofs the panels would be installed on would follow a community forum on the use of our roofs.

Nineteen people showed up for the forum and the discussion was lively. This was clearly a case of "private use of public areas" because the electrical credits generated by the new solar panels would only go to 10 of our 32 families. Nevertheless the project fit well our mission "to actively co-create and sustain a neighborhood that is nurturing to people and nature." Our hope too was that we would find the means in the future for the other 21 families to participate in group net metering and then the benefit would be community-wide. Some folks want energy independence similar to the first solar project that went in. That owner uses batteries to store power to use at night or when an outage occurs. Some suggested that a mix of energy independence for some households and group net metering for others might work best.

Questions were raised about conflicts of interest among the residents who would own the new panels. Should they be involved in the Owners Association's decision as to whether to go ahead? With our consensus-based decision process, conflicts of interest may possibly be less relevant because not just a majority but everyone needs to be on board. Is there a way residents can have some say in the decision as to what happens over their heads—at least if there will be serious disruption of their lives during installation or ongoing? The group net metering project sputtered its way through probably because "enough" of our residents seem to benefit. The 48 solar panels were installed in late Fall 2012 and started producing power in January of this year. Each month 10 families see a credit on their electric bills.

There is a move afoot to expand group net metering so that every family that wants to can participate and those who want to add more panels will be able to. Burlington Electric even has a program now of low-interest loans tied to property taxes that will cost less each year than the savings on electric bills. This time though, the community seems to want a thorough thrashing out of the issues around "private use of public areas." This seems to be a debate about competing private uses of common areas. Although photovoltaics may be in keeping with our mission statement, we need not conflate "in the interest of the community" with "undertaken by the community." Essentially if it is not the Owners Association doing and owning a project, then we still only have one private use vs. another private use.

It is unlikely now that further solar panels will go up in our community unless we develop together a plan for a full build-out that all families will participate in. Perhaps we have to devise a method whereby individuals can invest and their financial interests will be protected but the community as a whole will own the panels. The discussion about how this might happen is planned for this Fall and it is likely to be a lively one.

General Project Details

Burlington Cohousing Common Circuit 25.4 kW Solar Project
Expected First Year Energy Production: 31.450 MWh
Developer: Burlington Cohousing Solar LLC with help from Community Energy Exchange L3C
Installer: Vermont Solar LLC www.vtsolar.com
113 Solon 225W Photovoltaic Modules with Enphase M215 Inverters
Total System Cost: $144,864.00
Less Federal Grant: $43,459.00
Less State Incentives: $24,069.00
Net Cost: $77,336.00
Cost per Solar Panel: $684.39
Cost per installed kW: $3,044.72
To view system go to: enlighten.enphaseenergy.com/public/systems/gyBG12559

Burlington Cohousing Group Net Metering 11.52 kW Solar Project
Expected First Year Energy Production: 13.868 MWh
Developer: Burlington Cohousing Net Metering Group with help from Community Energy Exchange L3C
Installer: Vermont Solar LLC, www.vtsolar.com
48 Solarworld SW240 W Photovoltaic Modules with Enphase M215 Inverters
Total System Cost: $57,610.00
Less State Incentives: $6,912.00
Less Federal Tax Credits: $15,210.00
Net Cost: $35,488.00
Cost per Solar Panel: $739.33
Cost per installed kW: $3080.56
To view system go to: enlighten.enphaseenergy.com/public/systems/3wpF144878

Don Schramm is one of the founding members of Burlington Cohousing East Village (bcoho.org).

Burlington Cohousing Energy Documents

Anyone wishing copies of the following documents—

A - Solar LLC Operating Agreement

B - Solar LLC Power Purchase Agreement with Burlington Cohousing

C - Net Metering Group Agreement

D - Solar Equipment Hosting Agreement

—may email noah@communityenergyexchange.com.

Establishing and Incorporating Renewable Energy Technologies in Camphill Communities

A Personal Journey

By Martin Sturm

Joining a small rural Camphill Community at the age of 22 in the west of Northern Ireland in 1988 felt for me like taking a leap back in a time machine.

After growing up on a well-mechanised farm at Camphill Community Brachenreuthe in the south of Germany and completing training as a biodynamic farmer on a modern community farm near Frankfurt (Dottenfelderhof), I found farming in the community in Northern Ireland a huge adjustment.

Neglected overgrown fields without infrastructure, the lack of any but the most basic farming tools, little money, and lots of rain were some of the farming challenges. On the other hand, a growing lifesharing intentional community was providing much-needed care, support, and day opportunities for adults with learning disabilities. In 1989 a complete changeover of responsibilities took place when the remaining pioneering family left. This meant taking on a substantial amount of additional responsibilities.

Building houses, workshops, and farm buildings formed a big part of daily life for my first 15 years in this community. Since I arrived we've also explored many ecologically-friendly technologies.

In 1989 the farm installed a barn hay drier using a dehumidifier heat pump and solar gain of the roof structure for drying. The hay drier has proven itself in an unpredictable climate. Drying costs are lower than the production of baled silage. And milk from hay-fed cows is healthful and can often be tolerated by people who may have milk-related allergies, making it particularly suitable for the needs of our community.

Clearing the land with its hedges and coppicing woodlands produced stacks of wood every year, most of which was formerly burned as waste. In 1996 I asked my peers in our community for permission to research the possibility of installing a wood chip gasification boiler for one or more buildings. I initially envisioned using only the waste wood of the estate.

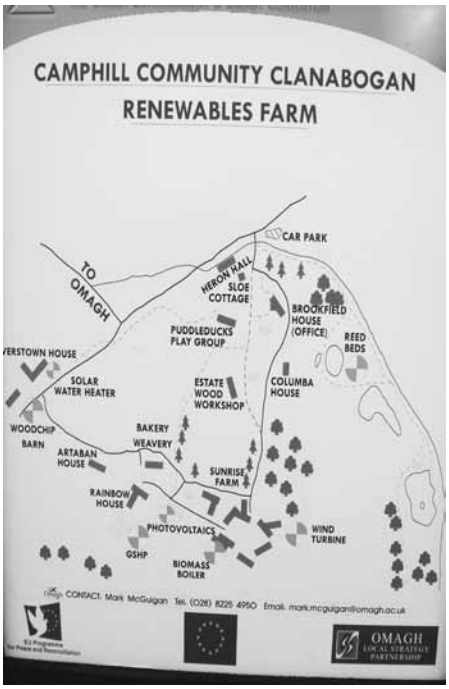
I travelled from Scandinavia through Germany and Austria visiting wood boiler manufacturers, studied different technologies, and had discussions with the company owners seeking their personal support towards a possible installation in Northern Ireland. After significant technological learning, all relevant pieces for the choice of boiler fell together when Fröling, an Austrian based company, made an excellent offer and more importantly promised full technical support. We also agreed that I could install the boiler myself.

When I returned home with the good news, I presented a proposal to my community together with a detailed feasibility study showing considerable savings potential and environmental benefits. I was surprised to learn that the real challenge lay not in the realms of technology or funding, but in individual people's worries, feelings, and fear of change.

It took many meetings and conversations, and a fair degree of patience and determination. Finally, during 1998 I was allowed to proceed with the installation of a 320 kW Fröling Lambdamat wood chip boiler to initially supply four large buildings (expanded to include six buildings now) with heat and hot water through a district heating network using steel pre-insulated pipes.

We erected a purpose-built wood storage barn and purchased a Starchl screened wood chipper, together with wood chip handling equipment. We housed the boiler in a new multi-purpose farm building. In our negotiations with professionals over the installation of the district heating network, quotations returned exceeding the available budget three times. This situation necessitated quick learning. We purchased pipes from Denmark, hired a digger, and engaged a coded welder. With a team of coworkers we installed the district heating network ourselves below budget and on time.

At Easter 1999 the house where I live became one of the first buildings connected to the wood chip heating system; we took out the old LPG gas boilers and put a balancing vessel in its place. I will never forget how great the first hot bath felt, supplied with heat from our



Photos courtesy of Martin Sturm

own virgin waste wood rather than from manufactured LPG gas.

In 2001, the Omagh Environmental Energy Consortium formed—a partnership of South West Colleges (Further and Higher Education colleges for the southwestern region of Northern Ireland), the local District Council, and two Farmers Unions.

Structural funding for the development of the local area became available and Camphill Community Clanabogan was used as a Renewable Energy Demonstration Project. As a result, we erected a 20 kW Jacobs windmill, supplying electricity for the community. Solar hot water panels fitted to one of our large buildings began supplying domestic hot water. A new 2 kW photovoltaic array fed electricity into the community. A ground source heat pump supplied the heat in an experimental root zone heating system in a large polytunnel in the garden. We also installed a further domestic wood chip boiler for a single dwelling.

The partnership with the college brought thousands of visitors to the community. Renewable Energy training courses and conferences were organised and partially held on site. The Northern Ireland government included the project in their white paper for the development of renewable energy technologies in Northern Ireland. The project won several awards including an all-UK Beacon Award.

Many other renewable energy installations were assisted throughout the country, in particular wood chip, pellet, and wood log boiler installations. Several Camphill Communities in Ireland and further afield received advice and sometimes hands-on help with installations.

In 2009 a successful funding application to the Low Carbon Communities Challenge awarded £450,000 and led to the planning and installation of a large district heating system for Camphill Community Glencraig near Belfast. A single URBAS medium temperature medium pressure biomass boiler, installed into a purpose-built boiler house with an output of 1000 kW, now supplied heat to 22 units through a network of district heating pipes with a total length of 3.2 km and a total project cost of £650,000.

The URBAS boiler is technology used in large wood district heating and power plants. This type of technology makes it possible to utilise very low grade wood biomass with up to 65 percent moisture content. A big advantage is that any waste wood from tree surgeons or sawmills can be used without the need for drying or screening of the wood chip. Cheap virgin wood waste material can be sourced and turned into valuable energy.

In its first year of operation the project has displaced 280,000 litres of oil and produced savings of around £100,000.

The Glencraig district heating project won the all-UK Renewable Energy Association Award 2011 for Best Community Project.

In my experience, engaging with communities about their own renewable energy possibilities is a journey which engages not only facts and figures but also many varied human factors and community dynamics. It is an excellent field for personal development and learning. ❧

Martin Sturm was born in 1965. His parents were then founder members of Camphill Dorfgemeinschaft Lehenhof. In 1967 the family moved to Camphill Brachenreuthe. After completing his training as a biodynamic farmer Martin moved in 1988 from Germany to Camphill Community Clanabogan in Northern Ireland, taking on the establishing and managing of what is now a 150 acre biodynamic social care farm. Besides many areas of hands-on practical involvement and in-depth experience in renewable energy systems with particular emphasis on biomass, Martin is part of the senior management team and registered provider of Camphill Community Clanabogan.

Energy Efficient Heating, Renewable Electricity, and Community Renaissance at ZEGG

By Achim Ecker

ZEGG's New Energy Plan

ZEGG has implemented a new energy plan after it decommissioned the former wood-chip burner which had served the community well for its first 20 years on the Bad Belzig site (about 80 km southwest of Berlin, Germany; see www.zegg.de/en/). The old boiler had an output of 850 kW and had been visited by some 1000 people from universities as well as politicians, since it was a pioneering example of its kind. The new system, serving ZEGG's 100 or so residents as well as its many guests, is based around a new solar-assisted biomass heating plant with the following components:

- 250 square meter thermal solar plant
- a new wood-chip fired boiler with 500 kW heat output
- a log fired boiler with 350 kW heat output
- three combined heat and power (co-generation) plants, delivering 45 kW heat and 15 kW electricity running on super-renewable wind-gas from Greenpeace wind generators
- heat recovery from a walk-in cooling and freezing unit of the central kitchen

This energy mix means that 100 percent of ZEGG's thermal energy requirements are met from regenerative sources.

In addition to the co-generation plants, in 2011 ZEGG installed a photovoltaic plant of 29 kWp (peak kilowatts). Together with the already existing PV plant it amounts to 52 kWp electricity produced. The co-generation plants produce electrical energy in a CO_2-friendly way because the excess thermal energy produced is used directly for heating water and buildings. This leads to CO_2 savings of more than 66,000 kg per year!

The electricity used by ZEGG is 100 percent regenerative. The combination of co-generation plants and PV panels meets about 90 percent of ZEGG's electricity demand. The rest is bought from Greenpeace-Energy.

ZEGG also completely renewed the underground site heating network. Deterioration of the pipes had led to heat losses of up to 15 percent (c. 150 kW), which will now be reduced to around four percent. Reducing energy losses through insulation is more important than producing (even renewable) energy. For this reason, we are also insulating the existing buildings on the ZEGG site using renewable materials. At the rate of one building every couple of years, we apply full thermal installation, including work on the facades, windows, roofs, and floors. This also needs to be combined with more energy efficiency like LED lighting, energy efficient household tools, etc. During the first 20 years of the heating grid's existence the heating energy demand dropped by more than 30 percent even though extra houses were connected to it—largely because of additional insulation and other improvements. These new investments ensure that ZEGG continues to be a model center when it comes to the use of renewable and regional energy sources.

New Energy from Holacracy

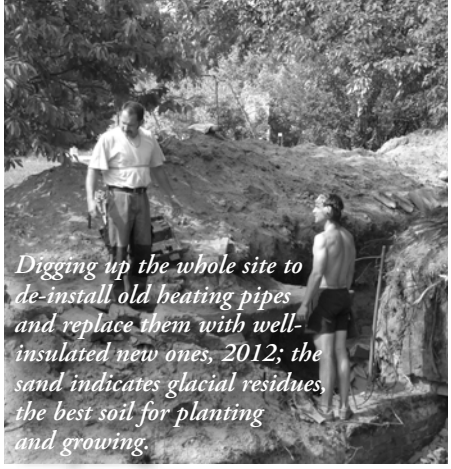
Restructuring the community and work areas to a holacratic system and organization two years ago helped us to take the necessary steps towards greater ecological sustainability. Decisions become faster and simpler to make and went very smoothly and easily here. Of course our long-famed training in working very intensively with ZEGG-FORUM and other methods has shaped our operational mode. We've learned to listen more to what moves others. It's helped us to decide to spend loads of money (around 800,000€)—which we essentially do not have—on being a very sustainable model; of course it will

Community tune-in exercise at the internal ZEGG community intensive conference, 2013.

Construction of a big photovoltaic unit above ZEGG's communal kitchen.

Construction of 260m² solar heat installation at ZEGG's central woodchip heating unit.

Open air dinner at closing of a Communities Conference on ZEGG's campus.



Digging up the whole site to de-install old heating pipes and replace them with well-insulated new ones, 2012; the sand indicates glacial residues, the best soil for planting and growing.

Closing ceremony of ZEGG's annual Summer Camp.

Photos courtesy of Achim Ecker

also save us money in the future from lower costs for fuel.

Our decision was well thought through, and acceptance was unanimous (we still use consensus decision making). As we are operating without inspired leaders or gurus, or a common ideology or creed, the fact that it worked easily reflects how much we've worked to develop good communication.

One topic where we do have arguments is whether to invest more in the seminar center for the guests that provide our main income, or to focus on better living conditions for ourselves, the people who run the seminar center. The first might generate more revenue or secure the income we have; the latter makes life better for us. But the focus on using renewables and being sustainable was never much of a debate.

Personal Choices and the Costs of Sustainability

Our ecological success as a community does not always extend to the "private sector" here. When it comes to the personal decisions we make individually—whether we use trains, buses, or bicycles in our travel plans, or airplanes and cars, like most of the rest of society—we aren't as consistent. Renewable things cost much more than non-renewables; taking a train is much more expensive than flying. We all feel constantly short of money, don't we?

We are proud to have grown out of being a very dogmatic community during our first 15 years, to become a very welcoming and diverse place.

While many are passionate about living sustainably, quite a few others in the community see steps toward a sustainable lifestyle as inconvenient. They believe they have sacrificed so much all their lives that now they want to focus more on their own comfort. Many still do choose to fly or to shop for "cheap and fast" rather than conscious and responsible.

Maybe this is a reaction against the dominance of community matters and values during the pioneering years? Then the private or personal came second or third, not first. First came service to the community and the world, as we were out to find a model of living that could counter all the atrocities we call daily life today. This did not feel like a sacrifice then, and even today I see it as being of service to something higher than just my own needs. Of course, this is all easier given that my basic needs are met anyway.

One very important aspect of it all is that we are not dogmatic about our lifestyles. We do what we can and acknowledge the limits to this as well. It is a relaxed striving towards being as sustainable as we could be. This way seems better for our hearts—and healed hearts then will take more care of the earth by themselves, without dogmas.

Where We Are Now

We are proud to have grown out of being a very dogmatic community ("we know what the world needs and how we all need to live and we lead the way far beyond anyone else") during our first 15 years, to become a very welcoming and diverse place, open to all aspects of life, during our last 20 years. Sometimes I wonder if we are too diverse and in need of some more focus—but as it looks now, this focus could be coming as more and more of us are hearing this calling. A growing number of ZEGG people want to bring their actions into better alignment with their knowledge and thinking.

We also celebrate that we've continued to exist since 1978! To last this long, we must have learned something about social communication and cooperation. At ZEGG, I notice a high level of self-responsibility and self-reflection in most communication—very different from elsewhere in society.

As I see it, we are still far from ideal (keep in mind that I write and hold trainings about integral community building). We may rest on past successes and forgot that it takes constant effort to maintain what we've established. Past effort wears off. We don't have a common practice of ZEGG-FORUM any more. We have common Forum work in the community about four to five times a year, when we all meet to prepare plans or rebuild community.

Just starting is a renaissance of a striving for community

(continued on p. 77)

Confessions of a Fallen Eco-Warrior

By Chris Roth

A Beginning at the End of the Road

When I arrived at my first place-based intentional community, tucked away in the Oregon woods, I wondered if I could feel good ethically about all the compromises I'd be making by living there. In the previous couple years I'd been living mostly in a tent, using just a small solar panel for electricity in my dwelling, cooking only with sunlight, getting around just by foot or bike, eating no animal products or packaged foods, trying to minimize my ecological footprint (including consumption of nonrenewable energy) in all the ways I could think of.

By contrast, this place—named End of the Road, although it turned out to be just the beginning of the road for me in the intentional community world—was, for one, hooked up to the electrical grid. True, our electric bill (for a group that ranged from four to 12 members at a time) was always less than $10 a month. We didn't have a refrigerator (substituting a "draft box" on the back porch instead), but we did have a freezer, which contained, among other indulgences, packaged, nonorganic, milk- and sugar-laden ice cream. Instead of tolerating the ambient temperatures, people here also built fires for warmth (burning trees and adding to pollution and global warming), and also cooked with wood and even propane. A few of them had cars, which they occasionally drove to town. There was even a computer in the office, which some residents used occasionally.

The difficulties in adapting to this collective pact with various civilizational devils were obvious. It was far from ideal for an ardent eco-liver in his early-mid-20s (this was the mid-late 1980s, in an environmental landscape reeling from the policies of Ronald Reagan and James Watt), but it had to do, because it was the place I had chosen to pursue another goal: grow as much of the group's own food as possible by hand, to save all the energy that would otherwise go into growing and transporting the food we'd buy.

I did manage to stay fairly true to my ideals. For the next two years, despite the fact that I had a room available to me, I slept outside, getting my comfort and entertainment from the natural environment instead of pumping it into an indoor space. I don't think I ever actually lit a fire—I always let someone else give in to that weakness. I avoided the ice cream, built a solar cooker, made copious use of the hayboxes (retained-heat cookers) that I learned about there, never obtained a car and usually didn't even step into one, continued to eat a purer-than-thou, unpackaged diet, tried to purchase only "used" (not new) on those rare

occasions when I did find myself truly in need of something material, and put together the group's newsletter on a typewriter instead of the computer.

Most visitors to this place were coming from the opposite direction in terms of lifestyle. For them, our way of life seemed hard-core, austere, even severe—aligned with ecological ideals to a fault, often at the expense of comforts to which they were attached. It did fall on the hard-core end of the eco-living spectrum among intentional communities which were open to the public (we offered internships, courses in sustainable living skills, and other opportunities to get involved), but from my perspective it was still a study in compromise, especially compared with how native people had lived in this region for thousands of years preceding the European invasion (of which we were the latest representatives).

We were trying to undo the harm caused by that conquest of the land in whatever ways we could, but it was a long path to that goal, and we knew we had just started on it. We were forever hobbled by our upbringings in western consumer culture, but we hoped to explore and model a different way of doing things. This different way would—must—become the "new normal" if our species were to survive. Eventually, our own bad habits (like that ice cream in the freezer, once we were sufficiently unplugged) would melt away, replaced by the richness of the culture we'd helped create.

Photos by Chris Roth

The Wisdom of Babes

I'd been following this hard-core path for a while, spanning a couple years with a traveling environmental education school (see "Power and Disempowerment on the Ecobus," issue #148), a year-and-a-half on a Native American reservation, and close to a year immersing myself in solar cooker design and then ecological horticulture, all while living outdoors. Even before the "rebellion" that took me from an east coast suburban liberal arts education to a lifestyle that aspired to out-earthfirst EarthFirst!, I had reduced my nonrenewable energy consumption through an aversion to spending money, a distaste for automobiles and love of foot-powered transport, an ongoing boycott of "canned" entertainment, a dedication to eating low on the food chain, and other strategies. Some of these choices were intellectually and morally driven, stemming from my growing awareness of human impacts on the planet. But some were simply a return to the sensibilities that I'd had as a child before I had any awareness of larger ecological issues or knew much about any world outside my own life and family.

As a young child I was afraid of anything that made a loud noise. Someone else had to flush the toilet for me. Vacuum cleaners caused me great distress. Getting into a car often precipitated crying. Left to my own devices, I would have designed a world without any of those things—and it would have been a world that consumed a lot less (nonrenewable) energy. Gradually I learned to be a "big boy," one who flushed his own toilet, vacuumed his own room, cooperated by getting into the car, and even eventually agreed to get a driver's license (while vowing to use it rarely if ever). I hardened myself to the way modern life is, for survival if nothing else. Only crybabies, I concluded, can't handle the ruckus and commotion that the fossil fuel age has brought—and I didn't want to be a crybaby.

But I wonder:

Did my infantile self know something that our adult selves are just beginning to grasp? Is it possible that using so much energy, and living amidst all the noise created by this energy consumption, is actually bad for our own well-being, not to mention the planet's? Could our energy habits actually be in direct conflict with the biological, spiritual, emotional, and social health of the human animal?

It's Not Easy Being Green

As I mentioned, my arrival at End of the Road involved a lot of apparent compromise. But it was only the beginning of what was either a slippery slide back into being

an overconsumer or, looked at another way, a growth out of "energy fundamentalism" into a broader understanding of energy and how it works.

Gradually I realized that even though I couldn't think of myself as being so pure anymore, my participation at End of the Road did probably have a net positive impact on the planet, energy-wise. While not divorced from our culture's bad habits entirely, our group (even when there were up to a dozen of us) likely had a smaller ecological footprint all combined than even just a single typical mainstream American had. And we set out not only to "walk the talk" but to "talk the walk" and expose others directly to some of our practices. Our small nonprofit organization, Aprovecho, was the point from which several influential technologies spread.

Hayboxes, an old technology which can also be constructed with modern materials, result in cooking fuel savings of 70 percent or more. Aprovecho's brochures, newsletters, workshops, and living demonstrations ultimately seeded hayboxes in many places around the world. (I did my small part by later building hayboxes at a few other intentional communities and writing an article touting their benefits in COMMUNITIES #115.) Rocket stoves, highly efficient low-mass stoves with an insulated combustion chamber, able to be constructed from a wide variety of easily available or local materials, originated at Aprovecho, and have spread worldwide (see www.aprovecho.org, www.aprovecho.net).

An ardent advocate of solar cooking, I encountered a mixture of resistance and appreciation as I tried to introduce it at End of the Road and elsewhere. I discovered that others were not necessarily as willing as I to make sacrifices in the interests of cooking with "zero fuel"—inconveniences such as starting the cooking process earlier than they otherwise would, returning to refocus the cooker every few hours, risking uncooked food on potentially cloudy days, etc. The impulse to make a statement and be pure bumped up against the reality that self-nurturance sometimes requires being gentle with oneself and others, using easily-available resources on hand even if they're not perfect, taking one's own reserves of time and energy into account when making choices.

Ultimately, I left End of the Road and Aprovecho for significantly less hard-core situations, as I realized that no amount of energy fundamentalism could substitute for the renewable energy of human connection.

Less Purity, More Renewal

My community-living path took me to varied situations, and in most of them our energy-consumption habits were significantly closer to the American standard than I'd experienced at the end of Hazelton Road. Yet they were still a far cry from the mainstream. Every group I lived with valued energy consciousness, and our per-capita consumption was still well below average as a result of resource sharing, simpler living, ecological values, and a striving for responsible global citizenship.

I often tried to cling to the more extreme, "pure" practices in my personal living space, but found I had to make peace with living with electric heat (for example) in some common spaces, along with refrigeration, computer servers that stayed on all day, and other features of modern life that I could rationalize only through the fact that they were shared among many people, diluting their impact.

But evolving in me simultaneously I discovered a much greater appreciation of a different kind of energy: the energy of love, warmth, and light that human beings themselves can generate for each other, regardless of whether they are on-grid or off-grid. This energy ultimately drew me to the community at which I've stayed the longest (totaling more than a decade-and-a-half now).

When I joined it, this community hosted intensive personal growth workshops and held weekly well-being meetings in which members practiced the

skills and awareness cultivated by those workshops. We consciously worked on creating a culture in which openness, honesty, vulnerability, acceptance, self-acceptance, letting go of attachments, and love could set the tone of our interactions. When we dedicated ourselves to these intentions, and prioritized healthy communication and connection in our relationships, the energy we derived from this culture was palpable. In fact, the culture seemed to take on a life of its own, and even became our "default" mode; with our collective energy and daily practice behind it, it brought us along even in times of resistance, and became infectious even with visitors and short-term program participants.

It challenged us to see beyond a tendency toward judgment and imagined separation. It helped me realize that setting myself apart in a pure world of only "renewable energy" (or none at all) was not only impossible, but based on a false set of assumptions about the world. Without adequate and genuine human connection, the solo renewable energy pioneer may not actually create a model of a sustainable future. In fact, he or she may end up desperately accumulating renewable energy toys and gizmos, actually consuming more resources and energy than someone who's learned that the way to a light footprint is to learn to dance with others. This second approach may involve give-and-take, and compromises of black-and-white worldviews and positions, but it will likely ultimately result in more sharing and more resilience. It reduces the perceived need for more under-inhabited renewable energy mansions or fortresses, and increases the number of people who are happy sleeping on one another's floors, sharing one another's kitchens, and dealing with challenges together.

Solar Power and Soul

Part way through my renewable energy journey, a friend helped me assemble a photovoltaic system to power lights and a cassette player in my otherwise unelectrified cabin. For at least a dozen years, this served as the main or only source of electricity in my living space. Its initial installation cost less than running an electric line to the cabin would have cost, and even when I moved it to another location where grid power was available, I still valued not only the electricity it gave me but the lessons it taught me. As my experiences with solar cooking had done, it helped instill in me a much more acute awareness of weather patterns, and also showed me my own patterns of energy usage. I never flipped or left a switch "on" unless I had a good reason for using those electrons. Maintaining my own power system, I was constantly aware of the reality of limitations, of the need for conscious use of the earth's "goods." I could not live in a fantasy of limitlessness (at least not physical limitlessness)—if I acted as if the power in my system would never run out, it *would* run out.

If I acted as if the power in my photovoltaic system would never run out, it *would* run out.

Using my own off-grid photovoltaic system, like cooking with the sun, became a way of attuning myself not only to ecological realities, but also ultimately to spiritual realities. It felt like a form of prayer. It didn't always make logical sense—and since for most of that time I also had access to grid power (and used it in our common spaces), it wasn't even a statement of purity or a hard-core activist stance. But it did help me feel more grounded, and was a step back from the less-mindful energy consumption

Suzzy Stranger

so easy to fall into without deliberate measures to counteract it.

When, overwhelmed by changes at my home community and convinced that my own path had diverged from it, I set off for what turned out to be a year away, I at first tried to ignore how important my semi-off-grid lifestyle had been to me, and then tried to recreate it even more thoroughly—in two different communities, one of which was entirely on-grid, the other entirely off-grid. In the first case, I ended up partially fixating on misgivings with this on-grid lifestyle; in the second case, even as I was erecting my new panels on the roof of my new cabin rental, I was having grave doubts about whether this place was a good match for me. Sure, I could be "pure" from a renewable energy standpoint (if I ignored that these panels, batteries, and components had been manufactured on-grid and also just been trucked over thousands of miles of highways to reach me here in this remote off-grid location)—but my sense of community, of relation to the land, and of self had not recovered from the many changes I had put them through since leaving my home bioregion of several decades.

Ultimately, I sold my new photovoltaic system, moved back to Oregon to use my old one (with much greater simultaneous use of grid power), prioritized physical healing for a while (which necessitated making lots of car trips and even leaping into the energy footprint of a hospital operating room), stopped imagining that I could be pure, and found myself focusing much more on the kinds of human energy I exchanged than on the forms of physical energy. I did use more energy (whether nonrenewable or renewable) sometimes—but I also used less, since I saw myself as much less separate from others and so participated in a lot more sharing of resources.

A Future

The other night, I followed a link to the video of an interview with Sarah Wilcox-Hughes (www.permaculturedesigntraining.com/course/sustainability-interviews, Lecture 255). Sarah interned with me in the Lost Valley gardens a dozen years ago, and afterwards set out on a journey with her now-husband Ethan Hughes which led to their establishment in 2008 of an entirely off-grid homesteading community, now called Still Waters Sanctuary, the headquarters of the Possibility Alliance in La Plata, Missouri. During my recent year in Missouri, I visited their community many times, often staying overnight. In fact, it was the place I tended to feel most at peace. I couldn't have lived there permanently, because not only do they have no electricity but they also forbid computers, and my current job—not to mention chosen work in the world—requires a computer (the one I'm typing on right now).

In the interview, Sarah talks about the richness of life when it is up to us to create more of it—and when there are fewer distractions caused by piped-in power and piped-in culture. For most of human evolution, we have talked with each other face-to-face, created our own music and other entertainment, lived in greater attunement with light and darkness, gotten to know our neighbors and helped one another out partly because working together to meet our needs was a necessity. For most of our evolution, before the advent of fossil fuels and the electric grid, we've lived intimately with our place, with the earth and with one another, with few technological intermediaries and few artificial instant escapes from the moment.

That quality of experience is still accessible to any of us, simply by being present with the earth and with the people around us. It's what makes life in community rich for me. It's what draws me to assist in the four-day workshops that are the current incarnation of those we held "back in the day." It's what I value in my interactions with friends. And yet, unlike the stewards of Still Waters Sanctuary, I am not living that life exclusively most of the time. I make many compromises. I sometimes turn to technology for connection, rather than relying on myself or the people and land around me. I took in Sarah's thoughtful and inspiring words (captured on video more than three years ago) on my computer, imagining that I was back there, once again working in the garden with her, feeling connected to those people and that place instead of to my immediate surroundings. It was a fantasy experience of community and wisdom—but it was also real, in my imagination.

For most of our evolution, before the advent of fossil fuels and the electric grid, we've lived intimately with our place.

Even these words, typed into the computer, are a bit of a fantasy conversation with you, the reader, and with myself. But in this world of un-purity, in which I am renewed by many kinds of energy, and trying to suspend judgment about what forms it takes, they seem to want to be written. A century from now, many more of us may be living like Sarah, Ethan, and their friends. That life will be good. And this one is too, despite its ironies, compromises, and likely limited shelf-life. Everything evolves, and we're part of that. I'd like to believe that renewable energy—and the energy of renewal—will guide us through, if we keep our eyes open.

Chris Roth (editor@ic.org) lives at Lost Valley Education and Event Center/Meadowsong Ecovillage in Dexter, Oregon (www,lostvalley.org), leads nature walks at Mt. Pisgah Arboretum (www.mountpisgaharboretum.com), assists at Solsara workshops (www.solsara.net), plays guitar, has fun with kids and sometimes even adults, and edits Communities.

Geothermal Greenwashing and Injustice in Hawaii

By Amara Karuna

Editor's Note: The following article deals with geothermal electricity generation on a volcanic island. For a story about geothermal heating and cooling in a much different geological region, see *"Strangely Warmed," p. 46.*

On a warm summer day, I am floating in the warmth of the only large naturally heated warm pool in Hawaii, looking up at the blue of the sky, hearing the crashing nearby waves, and wondering how long this beauty is going to last. Will this still be here for our grandchildren to enjoy? I am not sure, and it weighs on my heart.

On the Big Island of Hawaii, there is a really special rural area on the eastern coast, called Puna. Puna is a strange mix of lush tropical rainforest due to the heavy rainfall and sunny Hawaiian climate, and stark fields of barren, black new lava. People here are a mix also, of traditional Hawaiians who have lived here for generations, and new arrivals of many races seeking a peaceful life, like those of us at La'akea Community. We live on the side of one of the most geologically active volcanos on the planet, which lends an edge of uncertainty and awareness of the fragility of life. It is peaceful, wild, and beautiful, and there are many people living off-grid, sustainable lifestyles. It is also an economically depressed area, and the land is cheap, for obvious reasons.

I moved here around five years ago to join La'akea, an egalitarian permaculture community living on 24 acres of Puna rainforest. We have spent many years now building our infrastructure, planting gardens and trees, and caring for the land. We thought we were safe here, in a backwater area where there is not much of interest to wealthy developers.

In mid 2011, we learned that are entire area is actually a ripe plum for the picking, and many multinational corporations have been making plans for years to exploit the resources here, mostly without the knowledge of the local people. They want to tap the heat under the ground to build many geothermal plants, and other heavy industries, turning our haven into an industrial zone. In fact, our organic farm is completely surrounded by land being leased for geothermal drilling operations. If they develop near us, our land values will drop to next to nothing, and the toxic gases and other pollution may make it impossible to live here.

Geothermal is widely believed to be clean, green, and sustainable, due to a massive publicity campaign from corporations. Even environmental groups promote it widely. Indeed, some areas of the world seem to be relatively fine with their geothermal power plants, although lately many problems have been coming to light, such as groundwater poisoning

and earthquake risks. It certainly seems much less polluting that nuclear, coal, oil, or natural gas fracking. Is it really what it is touted to be?

Maybe in other places, but not in Hawaii, which has one of the hottest, most volatile geothermal resources in the world. Geothermal plants seem to be OK when people are not living nearby. But here people are living right next door. There is no buffer zone at all.

We discovered that there has been a long history here with the one existing geothermal plant, and is it not a pretty picture. Demonstrations held here 30 years ago protested rainforest desecration and a geothermal plant that was openly venting toxic gases and creating large waste ponds that leaked and killed all the nearby plants. A well blowout that vented huge amounts of hydrogen sulfide into the nearby community forced a mass evacuation, made many people ill, and killed birds and animals. There were lawsuits, payoffs, cover-ups, and corruption. The plant was closed, and the site was never cleaned up. Then a new geothermal plant was built a few years later, which has a long history of accidental ventings, inadequate monitoring and regulation. All a few miles away!

"We started waking up every morning with crusted-over eyes, difficulty breathing, and skin rashes."

What a shock to find that out! It has sent me on a long journey of researching what is really happening, and why. It has kicked me out of our community love bubble into directly protesting huge corporations such as ORMAT, which also own the notorious oil tar sands projects in Canada. And that means I have little time left for enjoying my community life.

I have been interviewing many local residents and working to get the information out more widely. I love this process of investigative journalism, despite having personal feelings of being inadequate for the task at hand. It takes me into the local community meeting people I would normally never meet. And the ones I meet are powerful activists, and people who care deeply about this land.

I have been learning some interesting things about geothermal. For one thing; don't believe even the most charming ads, if it looks like it has a big budget behind it—which geothermal does. Obama is pushing alternative energy in a big way, which is great, in theory. Millions of dollars of grants are available now for developers. Unfortunately, this creates a mad scramble for the money, before any rational evaluation of the actual situation.

In our area, companies are being paid to drill to look for places to develop. So they just go about drilling even though this entire area is peppered with drill holes where they already looked. The problem with drilling is that it sounds like a freight train, creates harmful low frequency vibrations, and has gone on 24/7, disturbing the peace of any living beings in the nearby area. Sometimes this goes on for up to 10 months. People have literally been made ill and emotionally disturbed by it. This is the possibility that may occur near our land.

Is geothermal really safe and clean? Well apparently not. Ask the neighbors, they should know. They are telling me stories of accidents, metal corroding on their houses, dying animals, and sick babies. One neighbor said, "We thought geothermal was great, until we moved next door and started waking up every morning with crusted-over eyes, difficulty breathing, and skin rashes."

I am hearing of lack of government oversight, where the industry is permitted to regulate itself. I am reading of laws that have been passed by the state that take away the control of the local county council to decide what is built on its lands. I am noticing that the state and county governments get a cut of the geothermal profits, to the tune of about $1 million a year. Perhaps that influences the decisions?

I see research from the US Geological Survey stating that geothermal production actually causes earthquakes, and several plants in other areas have been closed because of this. I read of ORMAT proudly stating that its new technique, Enhanced Geothermal Fracturing (a form of fracking) will make a whole new world for geothermal development. Would they really use fracking here? In the most unstable Lava Zone 1? We asked their spokespeople, but they would not answer us.

Is geothermal really cheap, as they claim? The reality is, even if geothermal is cleaner than the fossil fuel alternatives, it is still based on a centralized, grid-based power system. Corporations love centralized power. Then they can make money

because everyone is dependent on them. Our power company in Hawaii has a 100 percent monopoly, and our power rates are among the highest in the country at 44 cents per kilowatt-hour. As the cost of propping up an aging grid increases, and the cost of solar components and other alternatives goes down, geothermal begins to look less attractive. The amount of power that is lost as the electricity travels through the wires is up to 40 percent. What really make sense environmentally is to make the power right where you use it, in microsystems that are not vulnerable to a massive grid meltdown—like the solar systems we use at La'akea.

I am discovering a lot of social justice issues as I learn about this. Universally, the places in the world that are the most polluted and desecrated are where the poor and indigenous people live, because they don't have the political power to protect themselves. Corporations will go into an area and find the leaders and elders of the culture, and treat them to VIP tours, cash handouts, and promises of massive benefits to the local tribe. It is hard for rural people to stand up to professional PR people with millions to spend on sweet talking. Once the elders are convinced, they sign the papers for the group and the power is turned over to the corporations, who often heartlessly exploit the land, and leave it ruined when they are done. The elders may not see the legacy of poisoned air, land, and water before they die, but their children and grandchildren are left with bitter regret.

This pattern is repeated all over the world. We don't want to see it here. The traditional Hawaiians in this area have suffered the loss of their lands being stolen, massive population decline, and disrespect of their long and rich culture. They are singled out for oppression. They number only 10 percent of the population of the state now, and have high rates of suicide, diabetes, and asthma. There is still time to keep this same pattern of environmental exploitation from fully playing out in Hawaii, but only if we inform the local people quickly, and alert the world to what is happening.

Hawaii is also a target area for Monsanto, which is extending its tentacles widely into many islands. Kauai island is the center for testing of new GMO crops, with hundreds of open air GMO experiments going on. Big Island is currently fighting hard to keep our area free and clean enough to continue growing organic foods, and the fight is thick and heavy right now, with a bill to prohibit GMOs at the county council. It is ironic to see that the mindless greed of these corporations would continue chasing profits until all resources have been used and everything has been destroyed in this most incredible island paradise. It is up to us to respond with clear and rational arguments and to stand up for protecting our land and people.

I feel like I am now living in a war zone, fighting just to exist. When the army comes over the hill towards your village, you drop your shovel and go to protect the children, and normal life is no longer possible. This battle is being done with our minds right now, with talking and social media and articles. It may again come to the point where we need to stand in front

of the trucks. Sometimes I feel like running away. I personally have the choice to go somewhere else. Many people here do not. When I think carefully...where is there to run? Where can we go to be safe from the long reach of an insane global industrialization?

Various people in our community are reacting different ways to this. A number of us are rising to the effort of changing the movement toward industrialization, and getting involved in the rallies, events, and public education. But we have to squeeze time out of our very full schedule of community life and farming. Others fear that direct involvement will set us up as targets for the government and corporations, which are now reported to be pursuing environmental activists. We have had long talks about this. It definitely sits as a cloud of uncertainty over our daily activities.

This is the time now where the inherent errors of this civilization are coming to a head. Now is when we get to see the results of our separation and greed, as the earth herself gives us feedback in the form of dramatic climate shifts, food shortages, and subsequent economic crunches. Now is when we really need community, as the changes and conflicts become more intense.

We have many blessings from living in a community. We strengthen each other, and we do not suffer from the rampant loneliness of our culture. It is time to reach out beyond our social circles to make our communities as large as possible. We can support those in our local areas who may not have the same skills and training in communication, relationships, and emotional processing. We can share food and comfort. We can provide organization and leadership.

This is the time to make a stand somewhere your heart is invested, with friends. ❧

Amara is an artist, author, videographer, and teacher of peer counseling. She is proud to be a member of La'akea community on the Big Island. See www.powerinparadise.com to watch videos on the topic. Please help with donations to tell our local people about the issues.

Strangely Warmed

A homeowner's adventure with Geothermal Energy

By Nancy Roth

Although my husband and I don't live in a "community" in the narrow sense, we do so in a wider sense, as our home is in a small midwestern college town, where people tend to know one another's business. This has repercussions for both good and ill, we have learned. The day after we moved here over 20 years ago, we didn't have enough cash for our purchase at a downtown shop and were told just to "bring the money in later." When we related this incident to one of our new neighbors, she said, "Just face it: if you are *not* to be trusted, pretty soon *everybody* in town will know it." On the other hand, when an acquaintance was divorced, there was no way for him to prevent the news from spreading that his former wife had written a book about the background of the estrangement, and before long people had borrowed all the library copies or else headed for one of the two bookstores in town.

People are very interested in one another, and also in one another's business.

So it was a good place to erect a green building. A few years after our arrival here, a "building like a tree" named the Lewis Center arose on the college campus, the dream child of environmental studies professor David Orr. The goal was to teach through the building's architecture itself what sustainability was all about, much as the great Gothic cathedrals of the middle ages taught theology and Scripture. Instead of a facade decorated with carved saints, its facade, facing south, let the light pour in. Instead of stained glass, it had solar panels; instead of a spire pointing heavenward, it reminded its occupants of earthly processes through its "living machine": a series of ponds that processed sewage from the restrooms. And, instead of rows of votive candles, giving their fragile light and warmth to small chapels, it had geothermal heating and cooling that kept the entire building comfortable in all seasons. Like a tree, it wasted nothing and continuously gave back resources to the earth.

Fast forward to the day our gas furnace gave up the ghost, and we called in the local HVAC guru, Tom Monroe. He came, catalog in hand.

As he turned the pages slowly, he quietly asked if we were interested in efficiency. We nodded. "Well, maybe you would be interested in geothermal," he said. My heart leapt. I remembered my enthusiasm (tinged with envy, I admit) about the Lewis Center. We would have to pay not only for the furnace and labor, but for the labor of the two local farmers who were free in their off-season to drill in our front yard four wells 150 feet deep. But this choice expressed our values so well! The Lewis Center had taught us that this technology was an investment in our planet's future and, thinking about our children and grandchildren, we decided to go for it.

Soon the farmers arrived with their tall rigs, and drilled through the heavy clay which so often confounds local gardeners. After about 75 feet, they hit a vein of sand, and soon thereafter, some rocky material, reminding us that once this flat Ohio landscape was a mountain range, and later an inland ocean. Into these deep holes that were themselves a geology lesson, Tom and his crew placed pipes through which liquid would eventually circulate, bringing the 55-degree F temperatures 150 feet below the earth's surface up into our home. A heat pump inside the basement wall would take care of the rest, compressing the air until it reached the temperature we'd set on our thermostat. Mercifully, the process could be reversed on the hottest summer days, so that when we turned the thermostat to the cooling mode, the hot air would travel back into the ground. Finally, the connection was made to our new hot water heater and furnace. "Furnace" however, is probably a misnomer, for nothing burns inside it: no wood, coal, oil, or gas. It is simply the largest computer in our house, in charge of supervising the whole process.

In the meantime, our property had become more distinctive, because our front yard was the only one in town that was decorated by four small mountains of mud. It would take a season or two before it would become its accustomed flat self, but in the meantime it became a source of local curiosity: "What on *earth* has happened in your yard?" Word got around about what we had done, so the question changed: "How do you *like*

your geothermal system?" Our answer was that we loved it: in winter, the heat was steady and comfortable, and we finally had a refuge from sweltering Ohio heat in the summer. Soon after, similar mountains of mud sprouted around town in the yards of those who had asked us those questions. And some neighbors, who had the luxury of ponds on their property, used water to access the temperature for the heat pumps. Word gets around here.

We have lived happily with the geothermal system for 13 years now, with only one blip: a year ago, the board on which the computer chips are arranged malfunctioned and our repairman discovered its manufacturer was no longer in business. So we had to replace the "furnace" with a new one. This one is made locally, by a company financially stable enough that we can depend on parts, should we need them in the future. It is also quieter than our old apparatus.

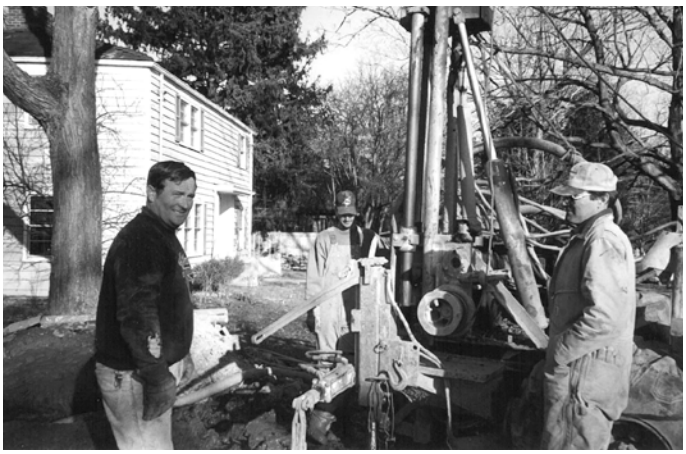
We did not really mind the "whoosh" when the old one would turn on and off, though, for at the time it had been reassuring, like a heartbeat.

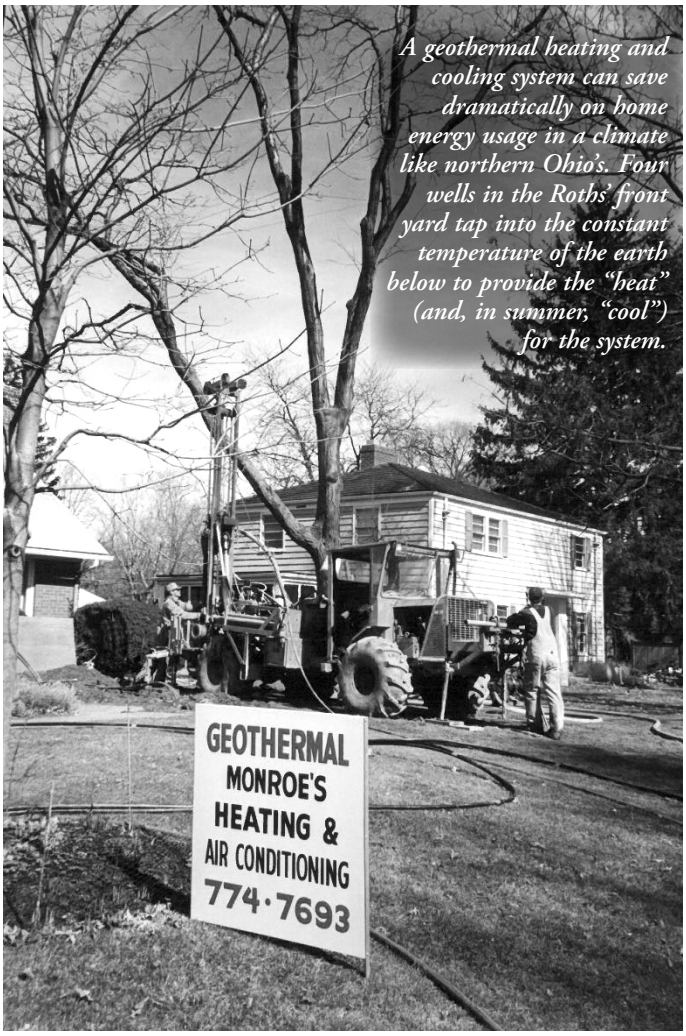
Because of the geology of northern Ohio, we caused no environmental damage, unless it was mental confusion to the earthworms confronted with temperature changes they had never expected. And people still ask us, "How do you *like* your geothermal system?" In a way, I suppose we are continuing to spread the message of the Lewis Center, like town gossips spreading some juicy news.

For we continue to answer, "We *like* it!"

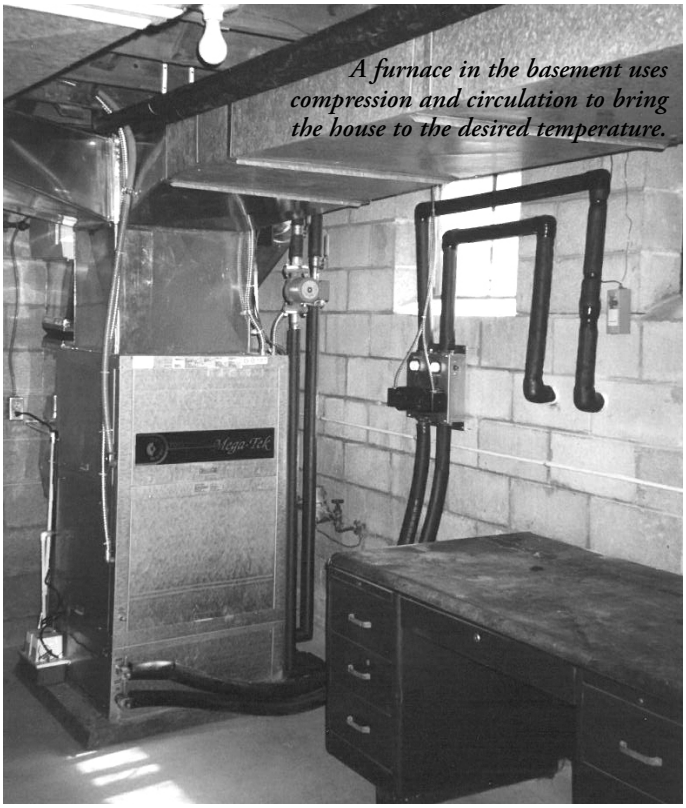
Editor's Note: For perspectives on geothermal electricity generation (as opposed to geothermal heating and cooling) on a volcanic island (rather than in northern Ohio), see "Geothermal Greenwashing and Injustice in Hawaii," p. 43.

Nancy Roth first heard about sustainability from her son, the editor of Communities. *She continues on the path of trying to live lightly on the earth while contributing to the movement to increase sustainability at home, in the community, and beyond. This article is an adaptation of a chapter of her book* Grounded in Love: Ecology, Faith, and Action. *See www.revnancyroth.org.*





A geothermal heating and cooling system can save dramatically on home energy usage in a climate like northern Ohio's. Four wells in the Roths' front yard tap into the constant temperature of the earth below to provide the "heat" (and, in summer, "cool") for the system.



A furnace in the basement uses compression and circulation to bring the house to the desired temperature.

Nancy Roth

Energy Efficiency in Cohousing

By Charles Durrett

When it comes to energy use, *"show me the bills."* My electricity bill last year was minus $88, for the entire year. My highest monthly heating bill last winter was about $20, in the Lake Tahoe area.

A few years ago we designed a Unitarian Universalist Church in Fresno, California. Katie McCamant was the project architect. It was the first LEED (Leadership in Energy and Environmental Design) gold in all of central California. LEED today is the best we can do to institutionally and universally quantify "sustainability."

In the next year, we designed a 28-unit cohousing community right next door. Many of the folks in the Unitarian Universalist congregation were involved in planning and ultimately moved into the cohousing community. I was the architect for the cohousing community and when planning it I asked the group, "Do you want to do the cohousing as LEED certified?" They chimed in all at once: "No way! Chuck, if we have an extra $40,000 to $50,000 sitting around, we'll have them all converted to one-dollar-bills, grind them up and pour them into the walls as insulation; at least that way, we'll get something for it." It took somewhere between $40,000-$50,000 to get the 8" x 10" certificate for the church—and that was just the paperwork and buying the certificate. There was very little value added, and there was no way that the same client group wanted that rigmarole again.

I understand why the population wants a formula. To be honest, American architects have advertised conscientious, sustainable design for a long time, but have produced little more than rhetoric. In fact, a formula is necessary if not critical for 90 percent of the architects. They didn't start doing or trying to make efficient buildings until someone came along and started measuring things. The problem is that for people who see neighborhoods more holistically, they are measuring the wrong things. They are not measuring how low your energy bills were. Instead they are measuring how many bells and whistles you had. The bells and whistles

always cost more and break down more often, aren't simple elegant solutions, but depend on gizmos and money. The Energy Star refrigerator is not always the one that is the most energy efficient—you end up using the more energy wasteful appliance because it gets you a LEED point.

Similarly, the passive house is another good formula if you have excess money and want to spend it on currently popular ideas. Again it often appears that if we can just come up with the latest magic bullet (straw bale, a passive house, or similar) we will beat the game. The best game is to be a clever practitioner, perhaps making buildings that improve the most conventional building practices—just as the most efficient autos are "engineered" like the Prius and know the many details that really matter. Look to evolve and engineer aggressively rather than to find the magic bullet. Look to further the craft of good practices, even when they're conventional. We know that if we tweak conventional construction by 10 percent we can improve energy efficiency by 80-90 percent. Plan to employ carpenters and other artisans who can later modify buildings to new clients and uses.

Before moving into cohousing, one resident was buying five to six tanks of gas per month; now he buys less than one.

Look at performance more than labels. People often say to us, "Oh yeah, that's like the passive house," or, "Yeah that will get you a couple of LEED points." That's not our concern. Our concern is: Do people love living there? Is it a high-functioning community?—because that is *the* crux of sustainability. Above all else, if it doesn't work socially, why bother? Yes, we're looking to have the lowest possible energy bills, the best natural ventilation, natural light, low toxic material, sustainably grown lumber (if we used lumber), flooring that is completely biodegradable, and much much more. But all in the context of working socially, being beautiful and elegant (because people take care of what they love and love what is beautiful), and in the context of what is affordable—predictably affordable. We are wedded to serving everyone in the group.

When it comes to sustainability, show me the community. So much sustainability is embedded in community. Last night I had dinner in the not-quite-new cohousing community in Grass Valley, California. A resident said that previous to moving into cohousing he was buying five to six tanks of gas per month; now he buys less than one. That's because his all-important social life now happens *in* the neighborhood. Our 34-unit cohousing community in Nevada City, California shares one lawnmower, one table saw, one hot tub, one, one, one, lots of things. People there would think you were crazy if you proposed a second lawn mower. If I tried to co-purchase a lawn mower on the single-family house street I once lived, they would think I was crazy.

When people come to the table with intention of cooperation, anything is possible, including saving our species, and *that's sustainable.*

Charles Durrett is an architect, author, and advocate of affordable, socially responsible and sustainable design who has made a major contribution in the last 20 years to a multi-disciplinary architecture and town planning—one that involves and empowers the inhabitants and enriches the sense of place and sense of community in both the urban and rural settings in which he works. Charles has designed over 50 cohousing communities in the United States, including Muir Commons, the first cohousing community in North America, and has consulted on many more around the world.

The Sun Touches Heartwood

By Richard Grossman

To create and live in a community which fosters harmony with each other, the larger community, and Nature.
—The Vision of Heartwood Cohousing

Perhaps my saddest day here at Heartwood was at a retreat a decade ago. One of my favorite neighbors said that he did not support using renewable energy because it didn't make financial sense. He pointed out that we were not an ecovillage. Fortunately, all our neighbors do not share that attitude. Since then the cost of the renewable energy infrastructure has dropped so that now it is competitive with conventional sources. Furthermore, we have devised a way to help our community afford what many of us feel is essential for our planet's future. Heartwood can feel the sun's power.

We take our community's Vision and Values statements almost as seriously as our Interpersonal Agreements. One of our Values is: "*Stewardship*: We live gently on the Earth. We are thankful for Nature's resources, being conscious to take good care of them and use them efficiently." We are living up to this Value more and more.

Heartwood Cohousing is located in one of the best areas in the US for solar energy. The sun shines here 300 days a year, but our climate is relatively cool because of the 7000 foot (2130 meter) altitude. This combination of brilliant sun and cool air makes photovoltaic generation of electricity very efficient.

Our community is medium sized with 24 homes and about 75 people, but we have as much land area as any cohousing in the US—we own over 250 acres (100 hectares) of wonderful land. Some is used for growing food on a large organic farm now with many animals. Much of our land is wild, with a few trails, for the enjoyment of wildlife and people. The sun keeps our crops growing and the woods healthy as well as warming and lighting the community. It would be a shame to not use the sun's energy to replace some of that otherwise generated by polluting fossil fuels.

Electricity and natural gas are amazingly inexpensive where we live in southwestern Colorado. We pay less than 12 cents per kilowatt-hour for "juice" from standard sources—largely from coal-fired power plants. Unfortunately, that cost does not reflect the true cost, because there are many hidden expenses or "externalities." Although these costs don't appear on monthly bills, they are real and often people elsewhere end up paying for them. Climate change from increased greenhouse gases is an example. Also, we all pay the government subsidies that support coal mining and power plants. What about the cost of black lung from coal miners? What about the health cost of particulates and mercury in the smoke? Good research suggests that our electric bills reflect only a half or a third of the true cost of electricity.

Some of us are more aware of the human impact on our planet and try to do what we can to minimize that impact. Unfortunately, many people are blissfully unaware. This continuum of understanding of environmental issues exists at Heartwood as well as in the rest of the country. Although I find this frustrating (as mentioned in the first paragraph), I am happy to say that we at Heartwood are better informed than most in our larger community.

Our attention to energy efficiency and harnessing the power of the sun started long before the first shovelful of earth was dug to build Heartwood. We create smaller individual footprints by living in a community and by clustering our homes. We chose energy-efficient building techniques and oriented our homes to maximize passive solar gain. About a dozen years ago, when compact fluorescents were becoming commercially available, one member gave CFLs as Christmas presents to every neighbor. Many of these are still shining and saving money.

After living here for several years we invited energy experts from our local electrical cooperative to talk to us about using less energy. We discovered that we could convert our community's electric meters from commercial to less expensive personal status. The money we saved went to buying "green" electricity—generated by wind or hydro. We have also encouraged members to pay the tiny increment in order to have "green" power in their homes.

Most of our vehicles are fuel-efficient. Many of us drive hybrids, but our rural lifestyle requires some heavy hauling. "Tritone" is a macho Dodge three-quarter ton turbodiesel truck available to members of the community. It is actually a combination of three vehicles (hence its name), and its prior use for forestry has given it its unique combination of dents. Its owners request only that users pay enough to cover the cost of fuel.

Heartwood now has five "solar systems"—three solar-thermal and two photovoltaic. Two of our straw clay homes were designed around their solar-thermal systems. The homes are well insulated and efficiently designed to be snug on even the coldest winter days. Much of their winter heat comes from the sun, and in the summer the domestic hot water is heated by solar.

The photovoltaic system on our home is seven years old. Although our roof is oriented perfectly, it is small enough that we could put only 10 panels on it. One of our criteria for the installer was we absolutely wanted the roof to be leak proof, since our bedroom is right underneath panels! Roofers tore off the old roof, installed a new waterproof membrane and replaced the metal. So far there have been no leaks and our bedroom is a little cooler in the summer because of the shade the panels provide.

Another criterion for our PV system was to provide about 85 to 90 percent of our electricity. This was an economic decision that was also forced by our roof area. The electrical co-op, with their net metering program, averages our production throughout the year. If the PV system produces more electricity than we use, they will buy the excess but at a lower rate than what they sell to customers. Well, last year I was surprised to learn we had actually made more than we had used, and so we received a small rebate. This increased efficiency was made possible by installing a new Energy Star refrigerator, some LED bulbs—and by turning off lights and phantom loads when they aren't needed.

What made my wife, Gail, and me decide to pay for this PV system? We have granddaughters. Now the girls are 10, six years old, and a newborn. We know that the world that they inherit from us will be very different from the world that we have enjoyed. In some ways it will be better, but we are concerned that it will be hotter and have scarcer resources. One of the actions that we have taken to try to make their world better is to employ renewable energy.

When we started thinking about having our own solar array there weren't many choices of installers in our area. Now there are more than a dozen, but back then I got only two estimates. One was appreciably lower than the other, but there was one major concern with that installer. Mick is a conservative Christian and I (a physician) am an abortion provider. I thought that sooner or later we might come to blows about abortion, so I brought up the subject early in our discussions. Mick had no problems working with an abortion provider and we ended up being good friends—and ended up with an excellent photovoltaic system.

Like most people and communities, we have limitations. Through the years we have dreamed of a photovoltaic system that could generate most of the "juice" for our community, but the figures just didn't add up for that dream to be economically possible. In addition, our electrical co-op has not yet made it possible to have "virtual net metering." Virtual net metering is necessary with a solar garden, where a large bank of panels provides power to multiple users. Metering of electrical usage becomes complicated since part of the electricity is from the utility and part is "homegrown." The Solar Garden Institute, based here in Colorado, has kept us informed of progress that is being made elsewhere in the US to make solar gardens feasible.

There are two pieces of good news. First is that the cost of photovoltaic systems is continuing to decrease. This, plus the rising cost of electricity, will make a solar garden more practical in the near future.

The other good news is political. One Heartwood member has used her political savvy to mobilize public sentiment. For years our electrical co-op had only one person on the board of directors who favored renewable power. Katie and a small group of people worked hard to get two more forward-looking directors elected last year. This year, 2013, all three "green" candidates won! Now our directors are split 50/50, with half definitely supporting renewable power. We expect that the board will approve a policy to support solar gardens soon.

Water to irrigate our community's private gardens and our "village green" has to be pumped to the housing cluster. We initially had a small capacity solar pump, but it wasn't long before our need exceeded its ability and it had to be supplemented by a gas pump. The gas pump was noisy, polluting, and a hassle to fill and run. We saved money for several years so we could replace these two pumps with a larger solar pump. Fortunately, the technology has improved in the past dozen years so versatile, high capacity pumps are now available. Also, solar panels have become affordable. Although this setup is relatively new at the time of writing, the new solar pump has been a great success!

What can Heartwood members do to compensate for their carbon emissions? Furthermore, what can Heartwood Cohousing do to be able to afford renewable energy systems? Fortunately we found a way to help with both. In the four years since it was started, our Renewable Energy Fund has collected over $2,000 of voluntary donations. Most donors give every month at the same time they pay their HOA dues. The Fund was set up to help people mitigate their unavoidable use of fossil fuels, and the money will be used to help the community switch to renewable energy.

We all depend on the sun for light and heat. Heartwood is making the transition from ancient sun power stored in fossil fuel to using the power of the day. We can feel good that, more and more, we have been touched by the sun. ❧

Richard Grossman and his wife Gail were some of the first inhabitants of Heartwood Cohousing, moving there in 2000. Dr. Grossman is an obstetrician-gynecologist who has helped families in the Four Corners region reach reproductive goals for over 35 years. His primary concern is the human impact on the natural world. His blog is available at www.population-matters.org.

The Personal and the Planetary:
Spiritual and Planetary Renewal at Lama Foundation

By Scott Shuker

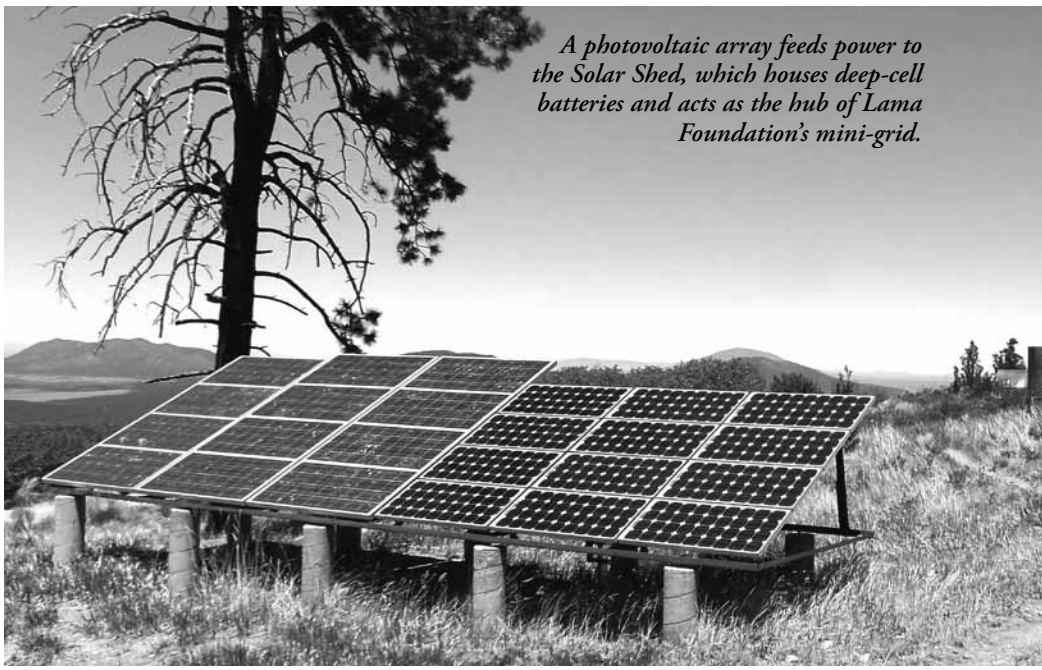
I've always been an advocate of appropriate technologies and renewable energy. There is truly a guilt-free and burden-less feeling that comes with using them; turning on a light switch doesn't mean more tons of coal and uranium being mined, processed, and/or burned. A solar technician told me many years ago as we christened Lama Foundation's new solar array that "the only energy you waste is that which you don't use." This was a profound revelation for me. Since its beginning here in San Cristobal, New Mexico, Lama has embraced an off-the-grid lifestyle and was a pioneer in solar energy since its advent in the early to mid 1970s. We have never been connected to a public electrical grid system. Over the years, we have continued to use and innovate according to available solar technologies.

Lama is also a place for spiritual energy renewal. Through practices of meditation, chanting, hermitage, dancing, and daily service, people find serenity and fellowship as a means of healing and a much-needed "soul rest" from the frantic and often frightening pace of the modern world. I've always seen the personal in the practical at Lama, expressing our love of the planet through the choices we make on how to live on it. That is why we have invested so much in achieving sustainability these past 45 years.

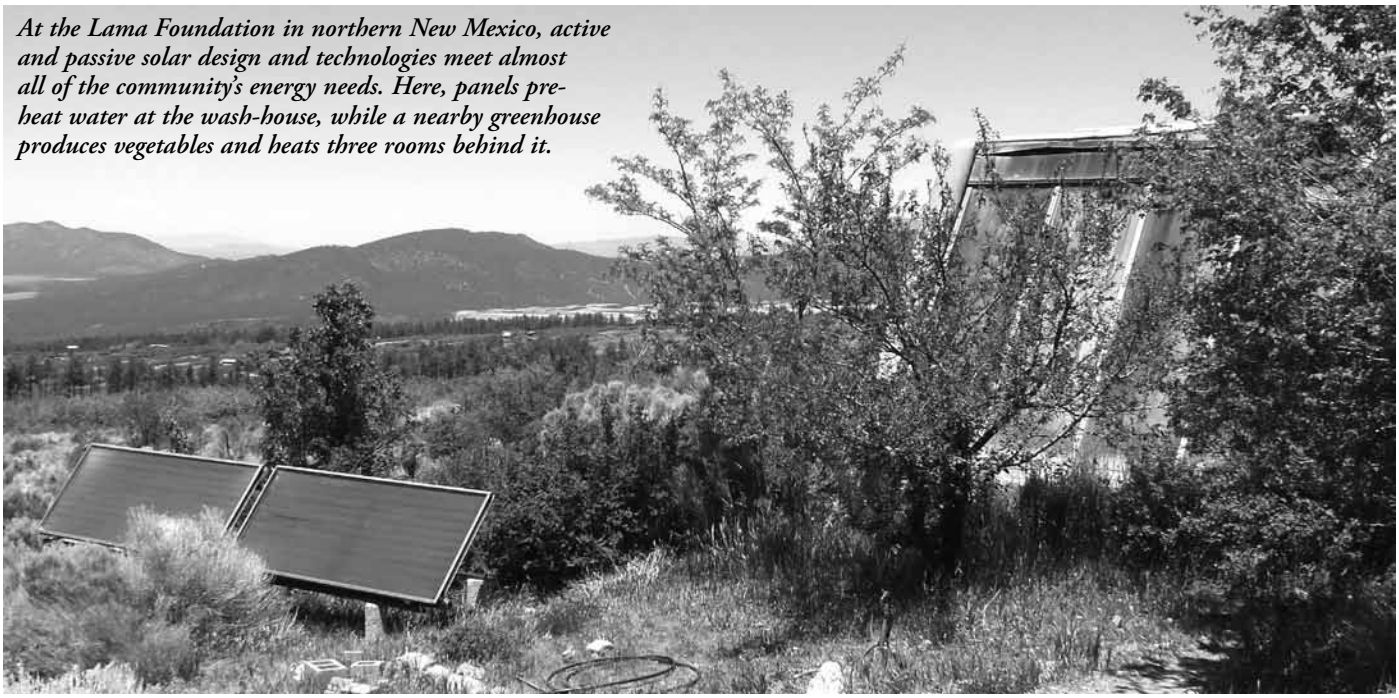
Today, we are thriving. We combine active and passive solar design which meets almost all of the community's energy needs. Since the 1990s, we've centralized most of our 120 watt power in the Solar Shed which houses deep-cell batteries which store energy from the solar array, as well as equipment that then converts it for use to our many buildings—our own mini-grid. In addition to newer models, we continue to use solar panels which were being used in the 1970s. Large, south-facing windows allow the sun to keep the shed and batteries warm in the winter. The shed also houses a propane-powered generator as back-up when the power drain causes battery storage to get too low.

We've recently retrofitted our main Dome Complex with two glycol solar panels just outside the wash-house, which pre-heat cold water then send it to a standard propane water tank for holding. This cuts down significantly on the amount of propane used for water heating. The greenhouse nearby not only produces vegetables, it heats three rooms behind it (when the sun's out, of course). There is also a homemade outdoor shower system, a black-painted water tank inside a glass-enclosed unit, in which water is heated then gravity feeds to the shower head. Usually by mid-day in the summer, the water is so hot one must add cold water to make it comfortable.

The Community Center is also mostly powered by the sun. We once had propane-heated water baseboard heating for the entire building in its early days, but the system became so dysfunctional and high-maintenance we finally gave up. Instead, we decided to rely on other design features which are more sustainable anyway. Lighting power comes from the central array and we use compact fluorescent bulbs only. The kitchen is heated in the winter by convection, relying on a solar attic (often reaching well over 100 degrees Fahrenheit during the day) which heats then circulates hot air by fan to the kitchen as well as the mudroom. There is also a fan near the kitchen ceiling (which is 40 feet high) which circulates warmer air back down to the bottom. In the winter, we install translucent panels over rafters located halfway up, which retain more heat in the area that is actually used. The office nearby is now heated by a small solar collector which works on the same principle as the solar attic. A small 12 volt solar panel and fan push the warm air inside. A large greenhouse and skylight downstairs provide heat to the lower rooms, which are also heated by wood stoves. All residences are either connected to the central grid or have autonomous 12 volt systems employing one panel and two batteries. This is usually more than adequate for the needs of one or two people. The pump on the summer outdoor propane-heated shower system is powered this way as well.

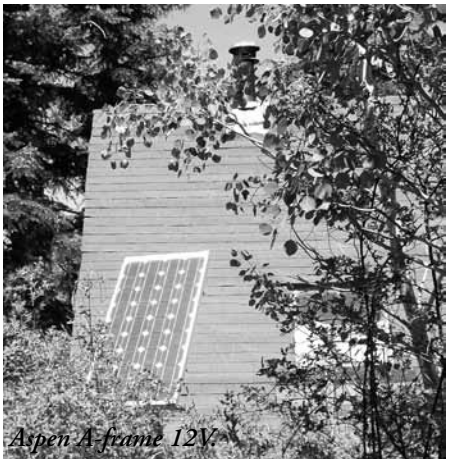


A photovoltaic array feeds power to the Solar Shed, which houses deep-cell batteries and acts as the hub of Lama Foundation's mini-grid.



At the Lama Foundation in northern New Mexico, active and passive solar design and technologies meet almost all of the community's energy needs. Here, panels pre-heat water at the wash-house, while a nearby greenhouse produces vegetables and heats three rooms behind it.

Scott Shuker



Aspen A-frame 12V.

Our latest innovation and our proudest achievement in sustainable design resides in the Cottage Industries building. It is virtually self-sufficient. The electricity comes from the central community grid. Three glycol panels heat a radiant floor system along with large, south-facing windows. The indoor temperature, even on the coldest winter days, does not go below 60 degrees Fahrenheit. This allows our silk-screen ink to remain stable and not freeze, which has been a problem in the past. The CI building, which also houses a shower using heated water from the panels, is a very comfortable place to hang out or use a computer.

Using solar electricity does not mean total lack of waste or need for conservation. During extended periods of no sun (which are rare) and/or excessive demand, the batteries can get low enough to cause the propane generator to turn on in order to boost them to full charge. This uses more fossil fuel and shortens the life of the batteries. Panels, batteries, bulbs, cables, etc. all require intensive non-renewable industrial processes to produce, transport, maintain, and dispose of. We do recycle our batteries when they have worn out (though we've had our current store since the early 2000s). In the summer months and the shortest days of winter, residents must be extra conscious of power use so as not to require even more generator use.

For us, using this type of technology and design is a replicable model and has benefits for future generations. Many young people, from children to young adults, who may not have ever seen such systems, become more aware of how humans use and share energy, how that use impacts the system, the possibilities for a post-fossil fuel future, and its potential for low-or no-impact energy use. As a middle-school teacher, I've been able to actually develop a sustainable design curriculum based on the many concepts and applications I've learned at Lama. Doing so has created optimism and right livelihood for myself and a sense that younger generations are open to and even enthusiastic about renewable energy and appropriate technologies replacing the dinosaur of a fossil fuel energy system. I'm grateful to the Lama Foundation for this teaching and feel confident that the community will continue as a center for both the renewal of the spirit and renewal of the planet.

Scott Shuker is has been associated with the Lama Foundation since 1995, joyfully remains a Continuing Member of the organization, and has been a prior contributor to Communities *on Lama's behalf. He lives in Santa Fe, New Mexico.*

Land Management and Lifesharing at Innisfree Village

By Rhonda Miska

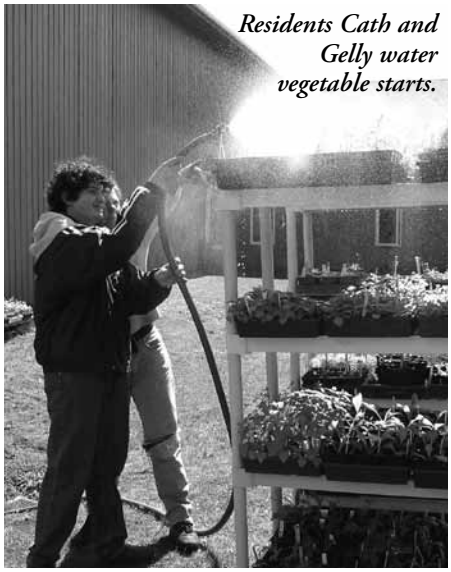
A Day in the Life...

At Innisfree Village at 9:00 on a weekday morning—as is the case in so many communities—everyone is beginning the day's work. In the bakery the bakers are tying on their aprons to prepare bread and granola. The weavers are sitting down at their looms to work on scarves and placemats. The kitchen is beginning preparations for lunch, which will feature the greens recently harvested from the garden as well as eggs from the farm. Herb and vegetable gardeners are slathering on sunblock and bug spray before heading out to weed and harvest. In the woodshop you can already hear the whir of machines as wood workers sand and assemble cutting boards. The farm crew heads out to the hen houses to collect eggs, which they will wash, package, and then deliver to several local restaurants and grocery stores.

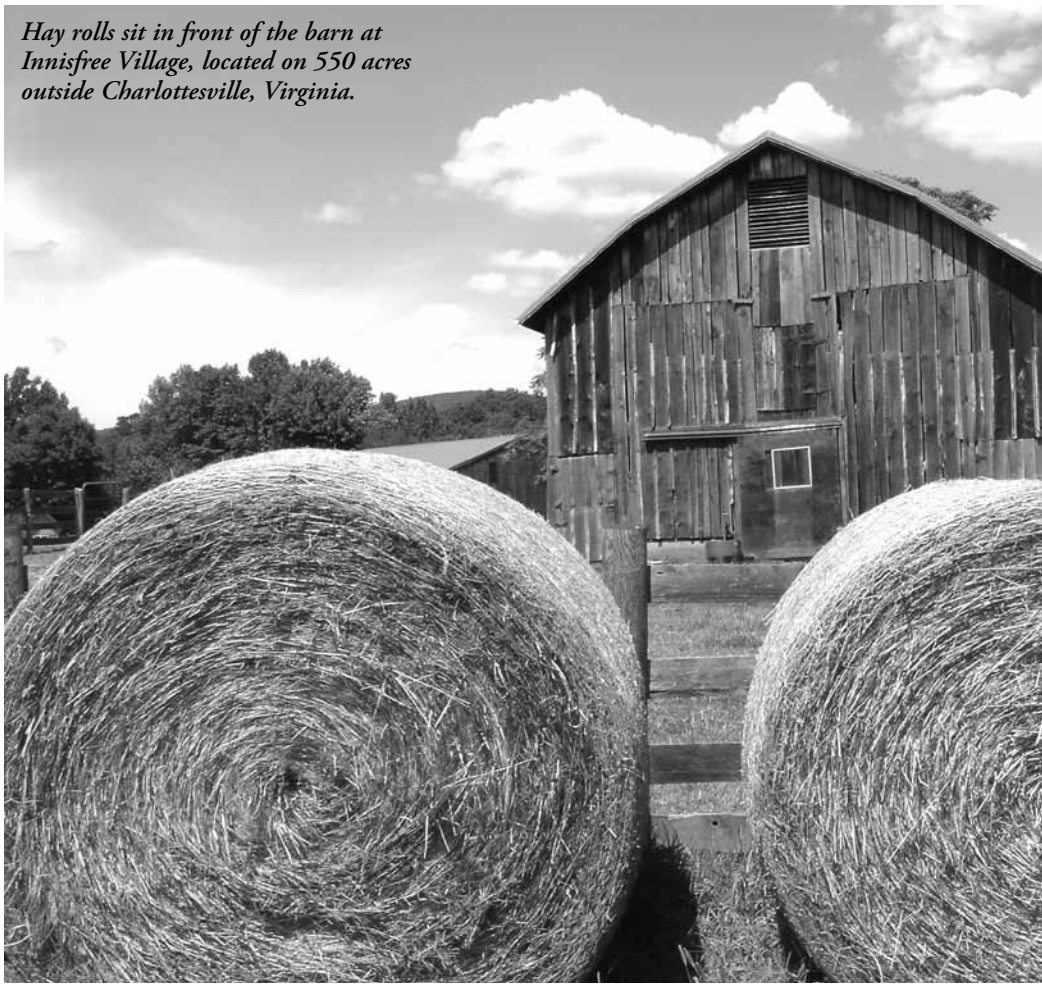
Each of these work crews are made up of coworkers: adults with intellectual disabilities such as Down syndrome, autism, and cerebral palsy. The term "coworker" was chosen intentionally to emphasize the contributions of community members with disabilities, who in other settings would be referred to in more clinical terms as "clients" or "patients." Coworkers are accompanied by volunteers who range in age from 20 to 70 and come from around the world for one year or more of community living and caregiving experience.

Innisfree was founded in 1971 by a group of parents with children with intellectual disabilities who wanted to create a community, not a facility, and provide a unique alternative to institutions or group homes which were the norm. Inspired in part by the communities movement of the 1960s, the founders dreamed of a place where people with special needs could lead lives of beauty, warmth, and respectfulness. They envisioned creating family-style homes and therapeutic workshops which focused on individuals' abilities, not their limitations. With a bank loan, the founders purchased land outside of Charlottesville, Virginia and chose the name "Innisfree Village" inspired by William Butler Yeats' poem "The Lake Isle of Innisfree." Innisfree's first executive director moved into an old farmhouse on the property along with his family and two adults with disabilities in the fall of 1971.

More than 40 years later, after many ups and downs, joys and growing pains, Innisfree Village now encompasses 550 acres and 15 residential homes. This includes a home with a common house flanked by individual apartments which are designed to give higher-functioning coworkers more independence and autonomy, as well as two houses in the city of Charlottesville for coworkers who hold part-time jobs outside the community.



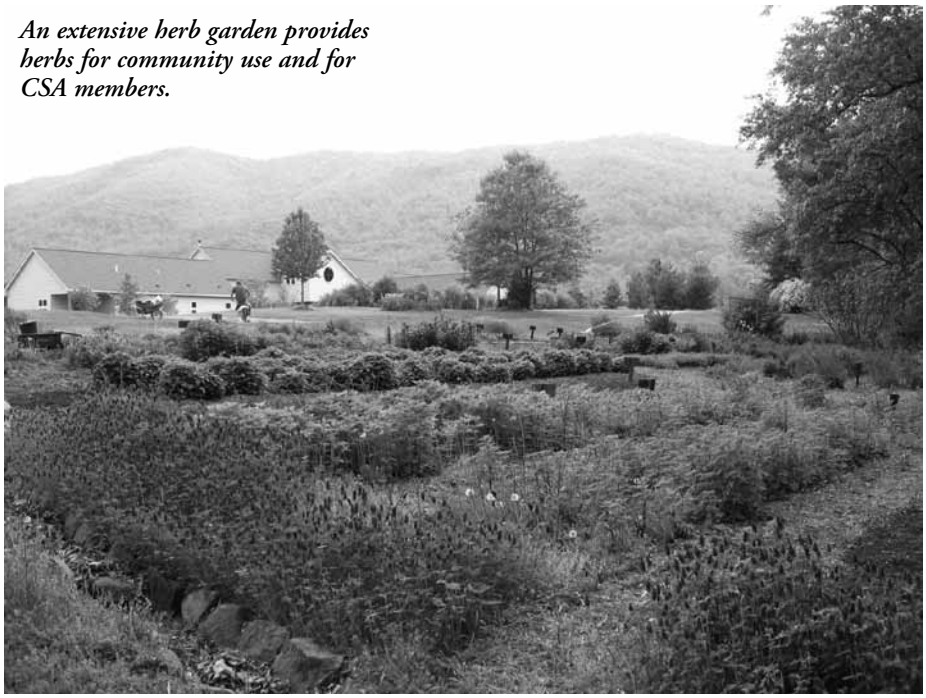
Residents Cath and Gelly water vegetable starts.



Hay rolls sit in front of the barn at Innisfree Village, located on 550 acres outside Charlottesville, Virginia.

Coworker Tom pulls a wheelbarrow.

An extensive herb garden provides herbs for community use and for CSA members.



Photos courtesy of Rhonda Miska

The Land

From the beginning, the community has been conscious of our relationship with the land. One of the principles outlined in our mission statement is to "promote efforts in the stewardship of our land to acknowledge the reciprocal relationship between our human health and the natural environment." We know that when the world around us is healthy, we feel better. Likewise, the better we feel, the more motivated we are to look around and try to improve the environment.

Currently at Innisfree there are about four acres of gardens which produce all types of vegetables, herbs, and flowers. Their bounty is appreciated both by Innisfree community members and by members of our local CSA (Community Supported Agriculture group). The vegetable garden crew also manages apple, pear, peach, and fig trees—processing much of the fruit through saucing and canning. Beef cattle provide meat to Innisfree community members, and about 300 chickens provide eggs to Innisfree residents as well as to the broader local community. In the past few years we have added a sheep operation, which means the arrival of new baby lambs is one of the most anticipated signs of spring.

Urbanite visitors to Innisfree are often charmed by the farm and gardens described above and we are quick to remind them that there is a lot behind that lovely country scene. Looking out at the flock of clucking chickens, the rows of blooming sunflowers and bright colored vegetables, and the cows on the pasture, one can imagine that Innisfree is a rural utopia. As many communitarians know, it is easy to romanticize living in harmony with the land and with each other...until you actually start doing the work. The days are long, the labor is demanding, and there is no shortage of obstacles to overcome.

Like any agricultural community, we contend with unpredictable weather and natural pests. Here in Virginia's Blue Ridge, we share the land with bears, deer, skunks, snakes, and other creatures. The hot and humid summers bring not only a bounteous vegetable harvest, but also run-ins with poison ivy, as well as ticks and chiggers. And gardening in a community setting—with people with disabilities, no less—means there are challenging relationship dynamics to manage as well. Since the majority of volunteers stay one year, volunteer turnover can impact the productivity of garden and farm workstations. Maintaining consistency is a struggle. Engaging with the land in community is rewarding, and it is also undeniably hard work.

We all reap the benefits of this work—through the delicious and healthy food we enjoy, through the income that is produced by what we sell, through the sense of pride we take in our efforts. There are also less tangible benefits to our engagement with the land. It helps create the rhythm of our common life as we move through the four seasons year after year. We celebrate the spring equinox by painting our vegetable buckets in anticipation of the first harvest of spring onions and greens, and the fall equinox by building a Sukkoth and pressing apple cider. During the colder winter months we enjoy making wreaths with dried flowers and seeds and during the summer many look forward to mowing and haying.

Our setting provides a unique sense of place, and several community members have described the feeling of peace and well-being that is created through being held in the mountains' embrace. Patty Coleman Saul, the daughter of Innisfree's first farmer, Joe Coleman, remembers her childhood fishing in the lake and riding bikes on the paths and reflects that "the land is the core of the idea of Innisfree... it makes us who we are if we are lucky enough to have been a part of it."

The Guiding Principles

Peter and Debra Traverse, farmers and land managers since 2007, articulate their three guiding principles in engaging with the land: "responsible stewardship of assets, meaningful engagement of community members, and financial sustainability." All of our initiatives at Innisfree Village related to land management flow from these three goals.

Responsible stewardship of our assets means, first and foremost, valuing this land and doing what we can to maintain and improve it. "We want to make the moral choice," says Peter Traverse. "We want to make informed decisions about our presence on this land."

We seek to meet the definition of sustainability offered by the United Nations' World Commission on Environment and Development: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." While much of mainstream agriculture today focuses on producing as much product as possible to create a maximum short-term profit, the approach favored by Innisfree and other ecoagriculturalists seeks to look at the health of the whole ecological system.

A key component of this system is the health of the soil, which is home to a multitude of organisms: earthworms, bacteria, fungi, insects, micro-flora and -fauna. A billion or more organisms may live in a single cubic inch of topsoil. Though "dirt" doesn't often receive much consideration or respect, in truth, soil is the basis of all we do. Healthy soil provides balanced nutrition for plant life, which nourishes us and the animals we raise. Conscious of both human health and soil health, we use no chemicals in our vegetable, fruit, flower, and herb production, and use organic farming practices. We move our chicken coops weekly to provide forage for the birds, and in turn they fertilize the soil. Similarly, we practice intensive rotational grazing for our sheep and cattle.

Meaningful engagement of community members is another guiding principle of land management at Innisfree. The workstations are therapeutic and seek to provide both coworkers and volunteers with meaningful work and the opportunity to learn and refine new skills. Many Innisfree volunteers come here from having been in urban or academic settings, and enjoy the chance to grow food and work with their hands. Coworkers are an integral part of our projects in the gardens and on the farm. Whether through feeding sheep, harvesting tomatoes, cleaning wool, felting soap, or any of many other tasks, they contribute to the good of the community.

Given the diversity of abilities and disabilities among our coworkers, lots of different jobs are needed. One coworker who can't be in the heat because of susceptibility to seizures may work inside helping process vegetables and herbs into pesto or soup mix. Another coworker with a lot of energy to burn off may spend work time pushing wheelbarrows, stacking firewood, or shoveling mulch. Coworkers with good attention to detail and fine motor skills enjoy stemming dried herbs or planting seeds in flats, while others with limited mobility may sift potting soil or grind herbs in a hand grinder.

Finally, financial sustainability guides the way we think about our relationship with our land. Regardless of how lofty our ideals or how spiritual our aims, to endure and grow all communities must think about practical ways to produce income that align with their values. The emerging market of ecosystem services is one area of current exploration. Much of Innisfree's land management efforts in the past years have gone into a stream restoration project, with the goal of producing income through selling wetland

and stream mitigation bank credits. We protect our streams and maintain the health of the ecosystem and are able to create a revenue stream by doing so. Often environmental sustainability and financial growth goals seem to be at odds with each other, so communities who own land like us need to think creatively about ways that both goals can be met simultaneously.

Looking Forward, Looking Back

Much on the land has changed over the last 42 years since the first four community members moved into the Walnut Level farmhouse. Short fences have been replaced by taller ones. Hoop houses have been erected at both the vegetable and herb gardens, allowing us to extend our growing season. A small, unheated potting shed which had been the home base for the vegetable garden was replaced with a much larger structure we call Swallowtail. We have developed relationships with local individuals, stores, and restaurants that purchase what we produce. We have added farm and garden interns to our work teams. We have constructed chicken coops, planted trees, cultivated new garden beds, experimented with new technology.

We protect our streams and maintain the health of the ecosystem and are able to create a revenue stream by doing so.

And we look ahead energized by the possibilities for the future and how our relationship with this land may continue to evolve. One current initiative is the creation of an ecological observatory at Innisfree, with an online portal that would be available to scientists, educators, and land managers to access field data. We hope that the observatory will lead to greater sharing of ecoagricultural techniques among farmers and lead to discoveries in land management, as well as create income for the community.

This is just one of many possibilities we are exploring of how to engage with our 550 acres in new and life-giving ways. In brainstorming sessions, we've imagined capturing solar and wind energy, exploring geothermal energy, running our farm equipment on biodiesel, partnering with local schools to provide hands-on environmental educational opportunities to area children, maximizing the energy efficiency of current structures, and building future structures to maximize passive solar energy. Guided by the principles of responsible stewardship of assets, meaningful engagement of community members, and financial sustainability, and with deep gratitude for all that the land gives us, we are hopeful about Innisfree's ongoing relationship to this land and energized when we think of potential new directions we may explore.

Rhonda Miska has served as the Innisfree Village Community Coordinator and been a part of the community since 2008. Originally from Wisconsin, she has lived in Virginia since 2004. She holds an undergraduate degree from the University of Wisconsin-Stevens Point and an M.A. from Boston College. Outside of Innisfree, she is active in local community organizing efforts, immigrants' rights advocacy work, and the Catholic Worker movement.

Narara Ecovillage, Australia

Photo courtesy of Bill Metcalf

Narara Dam creates a lake for swimming, irrigation, and fire-protection.

Photo courtesy of Lyndall Parris

Members unwind over dinner after lengthy discussions.

On a sunny Australian winter's day I meet with 40 people who are creating a large, dynamic, and diverse ecovillage about 60 kms north of Sydney.

We meet on 64 hectares (158 acres) of prime coastal land which they already own, and sit in a modern brick meeting room quite obviously of government creation, surrounded by industrial-scale greenhouses, scientific labs and offices, numerous sheds and workshops, plus two large houses. This was Gosford Horticultural Institute, a large agricultural research station that closed recently, and one of the agenda items is to decide what to do with their excess buildings.

I am in Sydney to research and write about Narara Ecovillage as well as to wrap up my research into The Manor, Australia's oldest urban intentional community, established in 1922. On one level, these two are as different as chalk and cheese—while on another level they face similar challenges and offer similar potential.

Narara members have already invested about $7 million to buy this site from the State Government, and pay for the numerous consultancy reports needed by their local government before lots can be sold and house-building commence. This money was raised from member loans, but extra bank financing is now being sought to help develop the expensive infrastructure.

This land became a State Experimental Farm in 1907, having been selected because of its "deep, rich soil, easterly aspect," and its location "close to two railway stations"—features which make it an ideal ecovillage today.

Narara Ecovillage's land is gently rolling, northeast-sloping, partly cleared for agriculture but still with extensive native forest. It has a stream running through it, a large dam creating a lovely lake for swimming, irrigation, and fire-protection, and is within walking distance of a train station, a little over an hour's commute from central Sydney. Their creek flats will facilitate intensive gardening and food production, and there is ample land for other farming activities.

As with many Australian place-names, Narara is probably of Aboriginal origin, but its meaning is uncertain, with suggestions of "black snake," "rib," and "bones."

Occasionally, I wonder about some of this ecovillage's promotion: "Here, there is an opportunity to build with the 'we'/the 'us' in mind. Not in any self-sacrificing way but in joyful, focused recognition that in what we are developing, the whole is definitely greater than the sum of its parts. The project is fulfilling and quite humbling in its gloriousness." Is this semi-utopian rhetoric? Perhaps. But it *is* true—even if emotive.

Why do people join Narara? Geoff, a scientist in his 50s, and Gail, a woman in her 60s, both tell me it is because their families have left home, they don't wish to live alone, and they see this ecovillage as a positive way forward.

Lesley tells me, "I was attracted to Narara Ecovillage as a community consciously living sustainably, with small water and carbon footprints. After reading about peak oil, climate change, overpopulation, and resource depletion, I'd concluded that moving from city life to a rural, locally-based village economy was 'the answer' to the impending 'unravelling of post-industrial civilisation.' However, after reading *The Great Disruption*, in which Gilding suggests it is too late to rescue our western lifestyle, I question whether it would make any difference. I remain a member of the Narara Co-op, but I'm unsure

if I'll live here."

More optimistically, some members are primarily attracted to the land, some want to escape the city, some want to live in community, some want a cleaner environment, some see it as the best place for their family, while others want to design and built their dream eco-house.

At today's monthly meeting, the passionate interactions between members, almost all light-hearted and sincere, suggest a dedicated group of well-educated, astute people who are not yet sure of their direction. Tony suggests they follow council regulations as closely as possible in their Development Application, while John suggests they should be more environmentally strict than required, to demonstrate their ecological ideals and strengthen their moral bargaining position. Some want to enforce small house sizes—but would that perpetuate environmentally-destructive, single-person households? Mark is confused by the agenda process, then Joey objects to the term "rules," instead preferring "guidelines." One of the proposed community contracts is to follow "Permaculture Principles" but Steve asks, "What are Permaculture Principles?" When no one responds he wisely asks, "How can we agree if we do not know what those principles are?" To this, Richard describes inherent conflicts between such principles and other economic, aesthetic, sustainability, and conservation goals. Eckard throws in a joke to which Kate responds. While this might suggest pandemonium, everyone stays polite, good-natured, and on-track.

The story began in 1997 when Lyndall Parris, this ecovillage's undisputed "mother," spoke at a women's function about her dream of communal living. By 2004, Lyndall had morphed this dream into Sydney Coastal Ecovillage, an incorporated association with the vision to "research, design, and build a stylish, inter-generational, friendly demonstration ecovillage near the coast not too far from Sydney, blending the principles of eco and social sustainability, good health, business, caring, and other options that may evolve for our well-being." Attracted to this vision, members joined Lyndall, who then left the workforce to devote herself to its realisation. She toured ecovillages around the globe including Torri Superiore and Damanhur in Italy, and Sirius, Earthaven, and Ecovillage at Ithaca in the US. Lyndall was particularly inspired by Liz Walker (from Ecovillage at Ithaca) and Diana Leafe Christian (from Earthaven Ecovillage), well-known to Communities' readers.

In 2008, members learned that this agricultural research station at Narara was coming up for sale, and opened negotiations to buy it. When the Global Financial Crisis hit, however, their funding collapsed as did negotiations, and the State Government withdrew the property from sale. Lyndall and Sydney Coastal Ecovillage members continued to meet, develop social networks, plans (and dreams) for intentional community, and, most importantly, their own competence.

In April 2012, this land came back on the market and, over a frantic few months, they created a legal framework and raised $5 million from members to buy the land. Interestingly, this is about $4 million less than they had offered to pay in 2008.

In some ways, buying the land has been the easy part. The hardest work then began—to get local government approval for the ecovillage design, create a legal and financial framework, agree on infrastructure design, future governance, and, most importantly, create a cohesive communal group out of the disparate "dreamers" who are attracted to the project. This phase is ongoing, and the meeting I am attending is part of that.

Seven adult members and two children already live in the existing houses on site, and while members own all the struc-

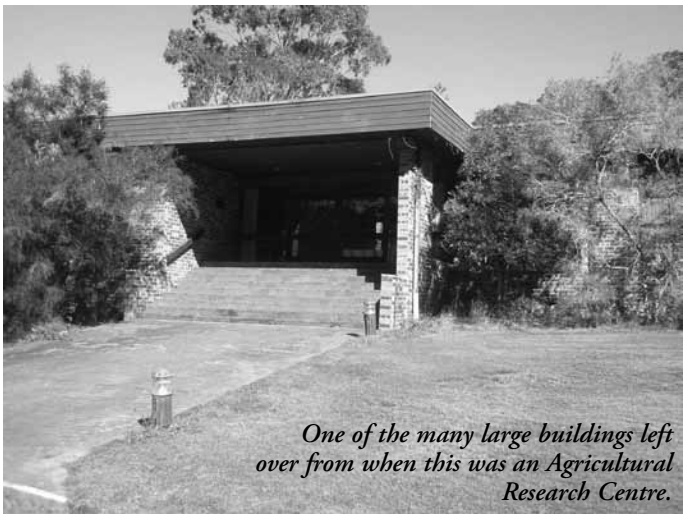


Photo courtesy of Bill Metcalf

One of the many large buildings left over from when this was an Agricultural Research Centre.

Photo courtesy of Lyndall Parris

tures, most can't be inhabited until their development application has been approved. Preparation for this development application has already cost over a million dollars for consultant reports, legal expenses, etc.

Their first stage has 55 lots for sale (mostly claimed), while plans for stages two and three will provide for more homes, increasing both density and affordability. Several members intend opening businesses on-site, using existing buildings. The main building, for example, could provide over 20 large bedrooms plus several large meeting and eating spaces for a conference/workshop centre, after minimal alterations, and their laboratories and greenhouses could be converted into commercial uses. Being within walking distance of regular commuter trains to Sydney means that residents can, if they wish, maintain urban careers.

Lyndall tells me, "I'm so thrilled that we finally own this gorgeous site. We first saw it five years ago and immediately felt it was perfect for us. From the existing research orchards and glasshouses, to the established buildings and dam, and the surrounding State Forest, it ticked all the boxes. It's taken us this long to buy it, and now our plans and dreams have a home."

Members meet monthly as a large group as well as more often in small working parties, as they aim to "transform the site into a model of sustainable living" and "a living resource demonstrating practical methods and technology for securing long-term social, environmental, and economic sustainability." They are exploring the most sustainable ways to generate their own power, provide their own water and at least some of their food, and dispose of their wastes. They are exploring governance models, currently following a modified form of democracy, including aspects of Dynamic Governance.

Narara Ecovillage has attracted world-class consultants. Australian architect Philip Thalis, noted for his sustainability and urban design projects, says, "This is the kind of project we dreamed of as students, so it's just a fantastic opportunity to work with owners rather than developers to create a place that focuses on human needs and aspirations first, rather than, say, car access."

Their landscape architects, McGregor Coxall, base their work on biomimicry—using natural templates and approaches to solve human problems, and this aligns with the ecovillage's "inspired by life" motto—as well as with permaculture.

Narara Ecovillage's Project Manager, John Talbott, who managed major developments at the Findhorn Ecovillage in Scotland, says, "We see this village, so close to Sydney, as the chance to model developments that we hope will become the new 'normal.' And so far we've got over 80 people already on board who want to be part of the village, from young families to singles to empty-nesters."

I wish them well. With a project like this, on an ideal site, with inspiration and guidance from their members and leaders, Narara looks set to establish a new high-water mark in ecovillage development, not just in Australia but globally.

Or will it?

To follow Narara Ecovillage's story see nararaecovillage.org. ❧

Dr. Bill Metcalf, of Griffith University, Australia, is the author of numerous scholarly and popular articles, plus seven books, about intentional communities, the most recent being The Findhorn Book of Community Living. *He is Past President of the International Communal Studies Association and has been* Communities *magazine's International Correspondent for many years.*

Members involved in intense one-to-one discussions about future directions for Narara Ecovillage.

Photo courtesy of Lyndall Parris

Members and guests enjoy a picnic.

Photo courtesy of Lyndall Parris

Late afternoon shows off rolling landscape of rich colours.

Photo courtesy of Bill Metcalf

Left over from the research station, these massive greenhouses offer great commercial potential.

Photo courtesy of Bill Metcalf

Self-Governance with Circles and Double Links:
How Sociocracy Can Help Communities, Part II

By Diana Leafe Christian

"This is one way we could re-organize the community," Malin said as she and Maria taped up a large sheet of easel paper with circles and arrows for everyone to see. Malin and Maria are members of Ängsbacka Ecovillage in Sweden, a five-year-old rural retreat and conference center community famous in that country for workshops and large festivals on spiritual/personal growth and ecological sustainability. I was presenting a two-day workshop on Sociocracy (also called "Dynamic Governance" in the US) there in June 2013.

Sociocracy is a whole-system self-governance method with a built-in decision-making process called "Consent Decision-Making" (*covered in* Communities *#160, Fall 2013*). Sociocracy is also a method for measuring, evaluating, and, if needed, modifying an implemented proposal to adjust to how the implemented proposal works over time in real circumstances, or to account for changing circumstances, inside or outside of the community.

"The Sociocracy Circle Method" (Sociocracy means "governance by peers") was created by engineer and businessman Gerard Endenburg in the Netherlands in the 1970s. Its purpose is to create harmonious organizations, based on the values of equivalence, transparency, and effectiveness. Endenburg was influenced by Quaker-based consensus; engineering, cybernetics, and feedback loops; and chaos theory and self-organizing systems. Now, 40 years later, many businesses, nonprofits, and schools worldwide—and some intentional communities—use Sociocracy.

At this point in the second day of the Ängsbacka workshop people were applying what they'd learned. A group of participants drew a map of how Ängsbacka could use Sociocracy's circles and double links to become more equivalent, transparent, and effective.

It was clear from how they drew the map—and from people's questions and suggested improvements—that these folks really understood the basics of Sociocracy, and that many were quite enthusiastic about it. As their Sociocracy trainer, I was delighted.

Part I of this article *(Fall 2013)* covered the benefits to a community of using Sociocracy for self-governance—specifically how it can enhance three aspects of a healthy, thriving community: "community glue," process and communication skills, and effective project management. The article also described why including Sociocracy's Plan–Implement–Measure & Evaluate feedback loops in every proposal reduces the need to "predict and control" how the proposal might turn out later. This reduces pressure on community members to try to anticipate all future circumstances that might affect the decision and to keep discussing and negotiating until the proposal becomes "perfect" enough so they can approve it (as is often the case when using consensus). Rather, since decisions in Sociocracy will be examined and possibly changed later, proposals only need to be "good enough for now," or "safe enough to try." Using Sociocracy frees up energy for curiosity, learning by doing, and innovation.

The operative phrase for Sociocracy might well be, "OK...let's find out."

Community Governance vs. Community Decision-Making

Generally speaking, governance—as compared to a decision-making method—determines how a community organizes, coordinates, and tracks its work tasks, available money, and information. *Sociocratic* self-governance is more structured—and, in my opinion, more effective—than the various well-organized, loosely organized, or non-organized decision-making processes used by most intentional communities. Governance is *not* the community's decision-making method. Its governance process focuses

Two participants in the workshop for Ängsbaka Ecovillage in Sweden demonstrating how they would reorganize their community using circles and double links, June 2013.

Diana Leafe Christian

on *which* topics it will consider and decide; its decision-making method is simply *how* it makes these decisions. (As noted above, Sociocratic governance includes a decision-making method—Consent Decision-Making.)

When Sociocracy is used in businesses and nonprofits it offers considerably more equivalence among management and staff than is usually found in these organizations. They not only become more effective, but become considerably more fair, inclusive, and transparent too. And...Sociocracy can help intentional communities—which are usually fairly equivalent and transparent to begin with—to become a great deal more effective and efficient in how they manage their community and achieve their goals.

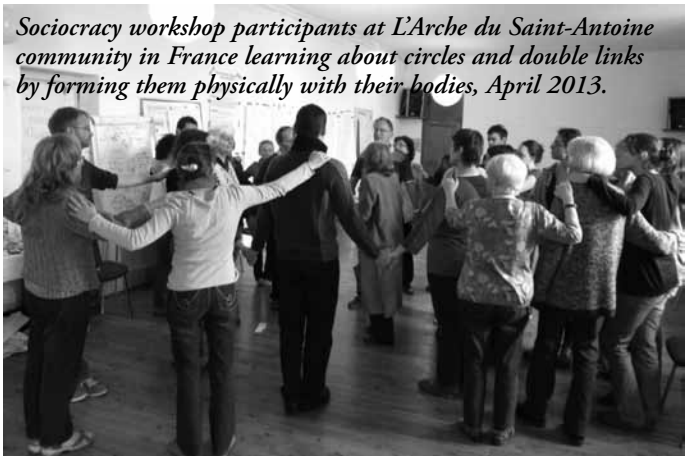
Sociocracy Circles

The organizational structure of Sociocracy consists of a group of "circles." Circles are semi-autonomous, self-organized groups of people with a specific area of authority and responsibility, whose members are tasked to accomplish a specific "aim" relative to their area of authority and responsibility. Circles are similar to what in intentional communities are called committees or teams, and in businesses are called departments.

Members of a circle make policy decisions for their circle; measure, evaluate, and perhaps modify their already-implemented decisions; keep records of their decisions and other circle business; and plan their own ongoing learning and development related to their area of responsibility.

Typically there is a "General Circle" with several smaller circles linked to it. Members of the General Circle discuss and decide more abstract, longer-term community issues: strategic plans, the annual budget, and large or far-reaching opportunities or challenges. The General Circle also creates each smaller circle and gives each one its specific area of authority and responsibility (called a "domain" in Sociocracy), and allocates money for its budget. General Circles are similar in focus and scope to whole-group plenary meetings in communities. However, they are not large groups comprised of all community members, as we'll see below.

Smaller circles focus on more concrete, specific, and shorter-term issues for the organization. A community's General Circle might create, for example, a Finance Circle, Promotions and Marketing Circle, Membership Circle, Land Use/Site Planning Circle, Repair and Maintenance Circle. *(See illustration #1, p. 63.)*



Sociocracy workshop participants at L'Arche du Saint-Antoine community in France learning about circles and double links by forming them physically with their bodies, April 2013.

Workshop participants at the workshop in France forming circles and double links with small circles and arrows to show Operational Leaders and Representatives.

"Larger and Smaller," "Higher and Lower" Circles

In Sociocratic literature the terms "higher" and "lower" circles are used to describe what I'm calling larger and smaller circles. "Higher" and "lower" do not mean "superior to" and "inferior to." Rather these terms indicate the level of abstraction the circle is responsible for—larger, longer-term issues or more concrete, shorter-term issues. But saying "more abstract, big-picture, longer-term circles" and "more concrete, specific, shorter-term circles" would be long and awkward. In order to prevent awkward phrases or connotations of "better" and "worse" I use the terms "larger" and "smaller." (But these terms are misleading too, since a "smaller" circle can have more members and thus be larger in population than the community's General Circle.)

A community's General Circle not only gives each smaller circle its area of authority and responsibility (domain) and its budget, but also its aim.

The Aim of a Circle

The aim of a circle is the specific physical and nonphysical things (i.e., "services") the circle provides the people it serves—the community as a whole, as well as any visitors it may have, or participants in any community-sponsored classes and workshops. (In businesses a circle's aim is the specific products and/or services it provides the company's customers, or, gives the company itself, such as bookkeeping services.)

The aim of a community's Membership Circle, for example, might be:

Physical things:

- New members—people—and money from any Joining Fees the community may charge.
- Member handbooks.
- Proposals to the General Circle about membership issues that may require more abstract, longer-term thinking.

Nonphysical things (services):

• Perform the tasks necessary to help new people learn about the community and meet its membership requirements (website text, handbooks, orientations, trainings), oversee how they meet the requirements (work hours, fees, community agreements), and manage meetings, interviews, references, and paperwork involved in these processes.

• Help community members meet and learn about the new people.

• Propose new membership categories if or when needed.

The aim of a circle is specific: it prevents the group from working at cross-purposes. It is described in terms of the *result* of the circle's activities, and is tangible; it can be delivered and received. It is the yardstick for measuring the circle's success. The aim is the basis on which circle members evaluate their reasons for being for or against a proposal.

A circle's aim can later be expanded or modified by either the General Circle or the circle itself, based on the circle's experience over time.

(Each circle, and the whole organization, also has a vision and mission. The vision is the better world imagined for in the future—the "why" of the circle or organization. The mission is the big-picture version of the activities to help bring about that future world—the "what" of the circle or organization.)

Creating Smaller Circles as Needed

A smaller circle can create one or more even smaller circles which have an even more specific focus and handle even more specific kinds of tasks. A Promotions Circle, for example, might create two smaller circles, a Website and Newsletter Circle, with the aim to write and produce these communication services, and a Visitor Circle, with the aim to welcome visitors and conduct community tours.

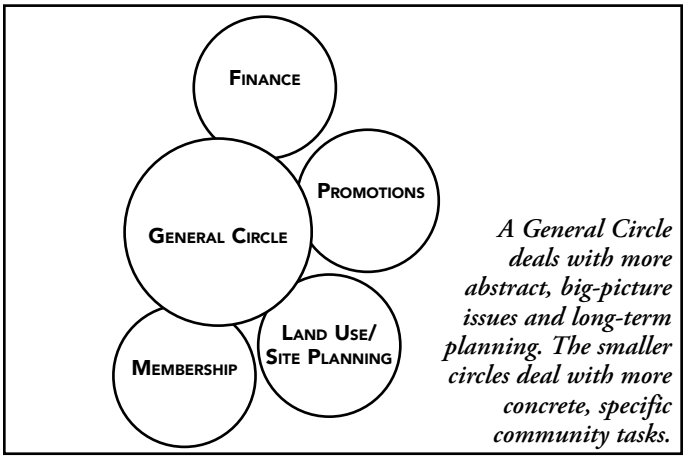
A Site Planning/Land Use Circle might create a smaller Buildings Circle, with the aim to build and manage community-owned buildings. It might create a Utilities Circle, with the aim to install and manage any community-owned off-grid power systems, water systems, graywater recycling systems, or composting toilets.

(See illustration #2, this page. Note that the circles on the left are more abstract and long-term, and circles on the right are increasingly concrete and shorter-term.)

Four Roles in a Circle

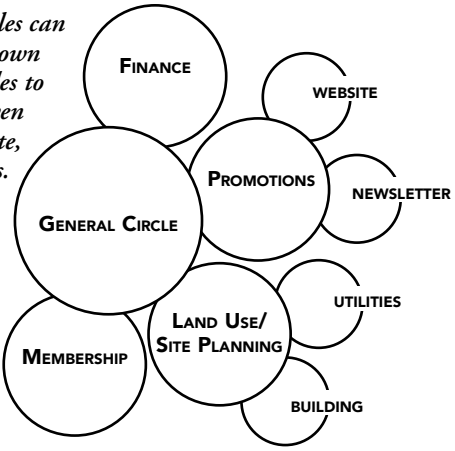
Each circle has four roles: a Facilitator, a Meeting Manager, an Operational Leader, and a Representative. The Facilitator is selected by the circle members to facilitate meetings, move the agenda forward, and keep everyone focused on the aim of the meeting and the aim of the circle. The Facilitator must understand Sociocracy well in order to remind any occasionally disruptive or misinformed circle members how Sociocracy meetings function properly, using any disruptions as opportunities to educate circle members in Sociocracy's principles and practice.

The Meeting Manager, also selected by circle members, either personally handles or oversees the process of creating meeting agendas, taking minutes in meetings, and keeping the records (in a physical circle logbook and/or online). (In classic Sociocracy

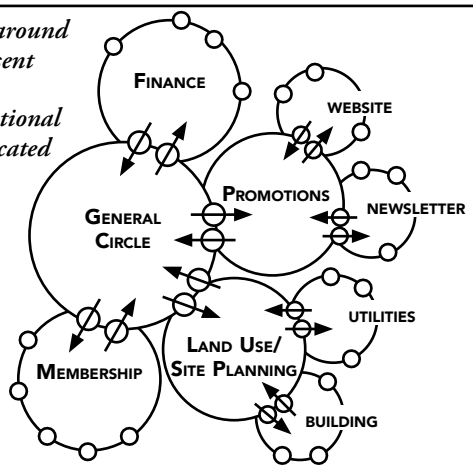


A General Circle deals with more abstract, big-picture issues and long-term planning. The smaller circles deal with more concrete, specific community tasks.

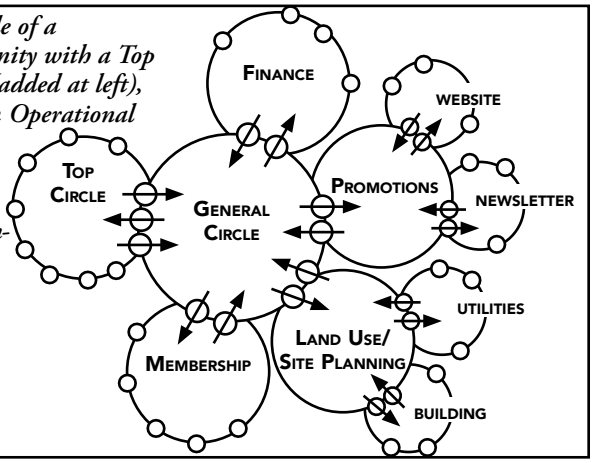
Smaller circles can create their own smaller circles to deal with even more concrete, specific tasks.



The tiny circles around each circle represent individual circle members. Operational Leaders are indicated with arrows pointing from the larger to smaller circle; Representatives with arrows pointing from the smaller circle to the larger.



Example of a community with a Top Circle (added at left), with an Operational Leader and two Representatives.



terminology the Meeting Manager is called the "secretary.")

Circles are linked by two people, called the Operational Leader and the Representative, who participate in two adjacent circles and transmit information between the two circles.

Double Links

The Operational Leader. A larger circle not only creates a smaller circle and sets its domain and aim, but selects someone to serve as its Operational Leader. For example, a community's General Circle selects an Operational Leader for the Promotions Circle, the Finance Circle, the Repair and Maintenance Circle, and so on.

The Operational Leader's task is to convey news, ideas, suggestions, needs, requests, and proposals from the larger circle they are a member of to members of the smaller circle they are also a member of. For example a community's General Circle would select someone to be the Operational Leader of the smaller Promotions Circle. The Operational Leader would then carry the General Circle's information to other members of the Promotions Circle. The Operational Leader of the Promotions Circle is expected to help other Promotions Circle members understand the larger picture of how Promotions issues fit into the whole larger community governance process—in terms of strategic planning, finances, legalities, and other longer-term, big-picture issues. Thanks to the Promotions Circle's Operational Leader, every circle member understands their circle's role in the whole scheme of community governance.

The Operational Leader is a full member with decision-making rights in *both* circles: in this example, in the General Circle and in the Promotions Circle.

The Representative. In the same way, a smaller circle selects one of its circle members to serve as its Representative to the higher circle. The Promotions Circle, for example, would choose one of its members to serve as its Representative to the General Circle. The Representative participates fully in the governance of each circle, just as the Operational Leader does, but has the specific task to convey news, ideas, suggestions, needs, requests, or proposals from the Promotions Circle to the General Circle. The Promotions Circle's Representative helps other General Circle members understand and have updated information on the specific projects and tasks of the Promotions Circle: for example its brochures, website, blog, newsletter, community tours and tour guides.

The Representative participates in the selection of the Operational Leader for their circle too, except when the circle is first being formed (since there are no circle members yet to select a Representative).

A smaller circle can select more than one Representative to participate in a larger circle.

The two-way flow of information. The Operational Leader and Representative form the "double link" between a larger and smaller circle. The General Circle and all the community's smaller circles are double-linked like this to create a smooth, easy, and transparent flow of information, suggestions, and requests from every part of the community to every other part.

The Operational Leader of a circle *also* conveys the news from other smaller circles to their own smaller circle, because they hear the reports from Representatives of other smaller circles in General Circle meetings. While presumably most people in the community read the posted minutes of each circle, having people in these double-linked roles also helps everyone know everything. Double-linking helps create more transparency in the organization. *(See illustration #3, p. 63.)*

When a smaller circle creates one or more of its own smaller circles, it also creates its domain and aim, and it selects the Operational Leader for its lower circle. For example, if the Promotions Circle created a Visitors Circle with the aim to organize and coordinate community tours, it would select someone to be the Operational Leader for the Visitors Circle (whose members might be the community's tour guides). Similarly, the Community Tours Circle would choose one of its own members to be the Representative to the Promotions Circle. This way every circle is directly or indirectly double-linked to every other circle.

Why not just one link? Gerard Endenburg, the originator of this method, and the employees of his company, Endenburg Elektrotechniek, measured and evaluated each modification of every aspect of Sociocractic governance back in the early 1970s when they first tried it. Endenburg and his employees found that using two people to double link worked a lot better than having one person do both roles. Having the circles double-linked rather than single-linked was "field-tested" by all these people in the organization where Sociocracy was invented and first applied.

It can be difficult for one person to do two different kinds of tasks effectively. In this case, one task refers to the smaller circle's need for the General Circle to understand exactly what it wants and needs. The other task is the General Circle's need for the smaller circle to understand the whole community's big-picture plans and goals. When one person tries to do both roles it can be challenging to do either role effectively. Endenburg cites cybernetics—the science of communication and control—and engineering feedback loops, to say that these two roles must operate separately and simultaneously. Authors John Buck and Sharon Villines point out in *We the People* it must be two roles for the same reason that electric power can't flow in two directions at the same time in one wire.

I like to use the analogy of arteries carrying oxygenated blood from the heart out to the capillaries, and veins carrying un-oxygenated blood back to the lungs to get more oxygen. The oxygenated blood goes out one set of "pipes"—arteries—and the returning un-oxygenated blood comes back in a second set of pipes—veins. Both kinds of blood can't simultaneously flow in both directions in the same set of pipes!

Sometimes communities using Sociocracy don't understand the double-linking principle well. They may not know Endenburg and his employees tried it both ways 40 years ago and concluded that a double link works well but a single link doesn't. When a community creates only one link between their circles, it tends to cause them trouble later. (So please remember electric wires and veins and arteries!)

The Top Circle

A "Top Circle" offers an outside perspective and information from the wider world. It considers issues such as the economy or trends in legalities, zoning, and other factors that could affect the community long-term, including potential challenges, or potential opportunities—forming alliances with helpful, influential organizations in the wider community, for example.

A Top Circle is comprised of both community members—one or more Representative(s) and an Operational Leader (if the group desires)—and non-community members who understand and support the community, wish to serve it, and can provide information and feedback not available inside the community. These could include former members, neighbors, lawyers, accountants, bankers, as well as experts in fields especially helpful to communities, such as governance and decision-making, Nonviolent Communication, Restorative Circles, local zoning issues, state water quality issues, sustainable agriculture, and so on.

The Top Circle is double-linked to the General Circle through its community Representative(s) and the Operational Leader for the General Circle (if there is one). They are members of both circles and have full decision-making rights in each circle. *(See illustration #4, p. 63.)*

The Top Circle serves as stewards and custodians of the community's vision, mission, and aim—ensuring its legality and solvency and overseeing and supporting the executive functions of its General Circle. The Top Circle exercises an influence on governance and policy, such as creating five-year plans, 20-year plans, and so on. Top Circle members could enroll the community in carbon-offset programs and other more "big picture" ways to practice ecological sustainability, for example. Anticipating the group will need new buildings as its population increases, a Top Circle could set up a building fund and encourage the needed discipline for members to contribute to it every year. A Top Circle could plan and organize physical infrastructure and specific services for community members as they age. A Top Circle can prevent an organization from becoming a stagnant "closed system," but keep it an "open system," serving as a beneficial outside energy source.

Depending on how the community organizes its Top Circle (which it does through its General Circle), some decisions may need consent of the Top Circle before being implemented. Some decisions may be entirely delegated to the Top Circle—depending on how it's set up.

Top Circle members discuss internal community issues only when asked to; for example if there's a disagreement the General Circle or smaller circles can't resolve.

Even though the Top Circle is called "top," it doesn't have authority over the community. In Sociocracy all authority is consented to and no one person or circle has power over any other person or circle. Rather, through the circles and double-links process everyone participates in the community's authority.

While a Top Circle *could* be granted exceptional freedoms to decide things—the ability to set the community's annual budget, for example, or to reorient the group's vision, mission, and aim—this could only occur in the absence of any objection from the Representatives and Operational Leader. So please keep in mind a Top Circle serves the community and can't make it do anything it doesn't want to do.

Some intentional communities using Sociocracy have Top Circles; others don't.

General Circles Don't Include the Whole Community

A General Circle is comprised only of Operational Leaders and Representatives from its smaller circles (and if the community has one, from its Top Circle). Thus if a community had a General Circle and five smaller circles linked to it, its General Circle would have 10 members, and a few more if it had a Top Circle. This can surprise community members learning about Sociocracy, as they often expect a General Circle to be like whole-group plenary meetings.

Making decisions in many double-linked circles is more effective and efficient than making decisions in one big, whole-community circle. This is because members of each circle are focused on the circle's specific area of responsibility and authority (its domain), and on its specific aim. And...members of these circles can't just do anything they want or keep information secret in their circle—nor can individual circle members stop what all other circle members want—because of the checks and balances built into the process and the Consent Decision-Making method.

Making decisions in many double-linked circles is more effective and efficient than making decisions in one big, whole-community circle.

A community using Sociocracy doesn't have to give up whole-group meetings, however, since people can certainly schedule whole-group plenary meetings whenever they like. Some communities using Sociocracy schedule whole-group meetings several times a year to discuss larger issues, discuss and consent to their annual budget, and/or create proposals about such issues through Sociocracy's unique proposal-forming process.

Some communities create "fishbowl-style" General Circle meetings, with the Operational Leaders and Representatives sitting in a small circle to conduct their business, and all the other community members sitting in a larger circle around them, observing and possibly participating in some aspects of the Consent Decision-Making process.

Consent Decision-Making and Sociocracy's Five Meeting Processes

In Sociocracy decisions are made by "Consent Decision-Making," so-called because everyone in a particular Circle

must give his/her consent to pass a proposal for that Circle. It is both similar to and different from the consensus decision-making that most communitarians are familiar with, and is derived in part from traditional Quaker-style consensus. The relationships between Sociocracy's double-linked circles and Consent Decision-Making are mutually reinforcing. These two aspects of Sociocracy are similar to the classic Taoist yin-yang symbol: one needs to understand both parts in order to understand the whole. For example, one needs to understand that objections in Consent Decision-Making must be based on the circle's aim, and for that, one must first know about circles and aims. And to understand how members of a circle can't be bossed around by the next larger ("higher") circle or by any individual circle members, one needs to understand how Consent Decision-Making works. More specifically, one needs to understand Consent Decision-Making in order to see why no individual circle member can prevent the circle from fulfilling its aim through personal, frivolous, or too-frequent objections to proposals. No circle member can bamboozle the circle with super-powerful charisma, aggressive words and energies, "you're attacking me" or "you're victimizing me" ploys, or other kinds of meeting behaviors many of us have experienced in community. The structure of circles and double links and Consent Decision-Making, working together, prevents these kinds of energy-draining behaviors.

Consent Decision-Making is the basis of each of the five meeting processes in circle meetings. These include (1) the proposal-forming process, (2) discussing and consenting to a proposal (or not consenting to it, as the case may be), (3) evaluating an already-implemented decision and deciding whether, and how, to modify it based on how it's working out in real circumstances, (4) selecting people for roles in the circle, and (5) providing role-improvement feedback to people in these roles.

We'll take up Consent Decision-Making—the second half of the yin-yang circle—in the next issue. ❧

The next article in the series, in the Spring 2014 issue, will describe Consent Decision-Making and the five meeting processes based on it. The last article, Summer 2014, will explore how communities learn and implement Sociocracy—what works well and what doesn't. Special thanks to Sociocrcy trainers Jerry Koch-Gonzalez, Sharon Villines, John Schinerer, James Priest, and John Buck for their help with this article.

Diana Leafe Christian, author of Creating a Life Together *and* Finding Community *and publisher of* Ecovillages *(EcovillageNews.org), speaks at conferences, offers consultations, and leads workshops internationally. Diana specializes in teaching Sociocracy to communities, and has taught in the US, UK, Sweden, France, and Canada. See www.DianaLeafeChristian.org.*

Why the Term "Operational Leader"?

In business and nonprofits, "Operational" means the actual work of creating the organization's products or services. Businesses and nonprofits typically conduct weekly or perhaps even daily brief "Operational Meetings" (sometimes called "staff meetings") of supervisors and employees to organize, coordinate, and track this work. And managers and bosses decide the organization's policies and strategies.

In businesses and nonprofits using Sociocracy, however, everyone in the company is part of a circle. Each circle conducts occasional "Circle Meetings" (Policy Meetings) to decide its policies and strategies, select people for roles, consider proposals, and evaluate already-implemented decisions. Each circle also conducts more frequent brief "Operational Meetings" to coordinate and track its daily work tasks. While a circle's Operational Leader is just one member of a Circle/Policy Meeting in terms of decision-making authority, he or she is the boss of the Operational Meetings—answering questions about the work, assigning and coordinating tasks, and resolving problems. Thus the terms "Operational" and "leader."

In income-sharing intentional communities the group may own one or more businesses in which community members work every day. If the community uses Sociocracy each circle may also conduct frequent Operational Meetings to organize, coordinate, and track their daily work tasks. And the circle's Operational Leader might indeed serve as the boss of these Operational Meetings (or not, as the circle decides).

In contrast, independent-income communities usually have no community-owned businesses and most people work at their own jobs or are retired. Work tasks done for the community are voluntary and take place when each member can get to it. Clerical or administrative tasks are often done on one's own at home or perhaps in a community office set up for this purpose. Physical work might take place in a group in monthly community work days.

Monthly or twice-a-month committee meetings usually combine policy-type issues and coordinating work tasks; there aren't usually separate committee meetings to only consider policies and/or Operational committee meetings to only coordinate and organize work. If the community uses Sociocracy, I recommend keeping the two functions separate, either considering Operational issues—organizing, coordinating, and tracking work tasks—in the first part of the circle meeting, and in the second part considering policy issues, or vice-versa.

—D.L.C.

Sociocracy Resources

- *Video:* "Lost Valley: A Tale of Sociocracy." Youtube.com
- *Article:* "Sociocracy: A Permaculture Approach to Community Evolution," Melanie Rios, Communities, issue #153, Winter 2011
- *Sociocracy.Info:* www.sociocracy.info
- *The Sociocracy Consulting Group:* sociocracyconsulting.com
- *Governance Alive:* www.governancealive.com
- *Sociocracy UK:* sociocracyuk.ning.com
- *Sociocracy Center in the Netherlands*: www.sociocratie.nl

Sociocracy Trainers Who Teach Intentional Communities:

North America: John Schinnerer: john.schinnerer@sociocracyconsulting.com
Jerry Koch-Gonzalez: jerry.koch-gonzalez@sociocracyconsulting.com
Diana Leafe Christian: diana@ic.org
UK: James Priest: jamespriest@thriveincommunity.co.uk
Australia: Gina Price: ginaprice@optusnet.com.au

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work exchange opportunities for Experienced Builder and Maintenance Leader. www.livingrootsecovillage.org Contact our New Member Coordinator for more information. newmember@indianacommunity.org 513-260-3939

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54 ACRE SUSTAINABLY FOCUSED FARM NEAR TAMPA FL, No debt, mission of sustainable living through the principles of permaculture, vegetables, pastures, native wetlands, syrup making, dairy barn, housing, solar systems, WAPF friendly, produce a Sustainable Living Program on WMNF 88.5 FM online http://www.wmnf.org/ . http://www.ecofarmfl.org/

DREAM RIVER RANCH IS AN INTENTIONAL EQUESTRIAN COMMUNITY FOCUSING ON CO-CREATING A QUALITY HORSE CARE FACILITY for its members and the public. It is home to Students and Horses Excel, a non-profit therapeutic horseback riding program that offers equine assisted therapies and activities for therapy or pleasure. Community members can share in these activities or enjoy their own equestrian lifestyle privately. Living with horses is not our only focus. We care about being good neighbors, living sustainably and being responsible in good animal, earth and human keeping. Members can help or lead in areas like organic gardening (with a Permaculture influence) and animal husbandry for our meat consumption, or building projects that improve our way of living. Our 80-acre community thrives in the vast open spaces of the SW Idaho prairie and backs up to Idaho State and BLM land. Out the back gate of the property, there are miles of trails along the Oregon Trail to explore. Whether your ride horses or dirt bikes, you feel the 'good for the heart' sensation of being free from all boundaries. Bring your family, horses, goats, dogs and kids (not necessarily in that order), build your house and live your dream. We are about 20-minutes from the local town, Mountain Home, and about 30-minutes from Boise in the opposite direction. Day and overnight visitors are welcome, please call to make arrangements. Membership investment is $10,000 per adult. We share the entire property and labor that is the usual for home ownership. We have barns, sheds, 80x140 garden, 80x80 building lots and a community hall. Visit our website at: www.DreamRiverRanch.org Contact: Willa at: SHEtherapy@dreamriverranch.org 208-602-3265.

PUBLICATIONS, BOOKS, WEBSITES

FREE GROUP PROCESS RESOURCES at Tree Bressen's website: www.treegroup.info. Topics include consensus, facilitation, blocks and dissent, community-building exercises, alternative formats to general discussion, the list goes on! Articles, handouts, and more - all free!

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FORMING COMMUNITIES

LIFE ENRICHING SUSTAINABLE FARMING COMMUNITY in Willamette Valley Region. People with 10+yrs. farming/intensive gardening and homesteading experience from NW sought to form core group. I'd like to hear from you, Kevin, 541-461-3798, kjashbow@gmail.com

REAL ESTATE

LIVE YOUR DREAM - AND HELP FIC! -- An incredible property is now for sale which includes a $10,000 donation to FIC when it is sold! Mention FIC to receive a free stay and dinner for serious inquiries. This amazing property for sale in the mountains of Western NC has everything needed to start and sustain an Intentional Community for anywhere from 35-40 core members in cabins and other hard lodging, and 50-150 others in primitive cabins, RV's, and tents. This 80 acre retreat includes Canopy zip line business in place, apple and asian pear orchard, honey bees, trout farm, blueberries, currants, 1500 daylily plants, numerous sheds and shop spaces, 3 bath houses, 3 greenhouses, laundry facilities, work-

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SEEKING COMMUNITY

HELLO - I WOULD LIKE TO LIVE IN A CREATIVE, MEDITATIVE, mostly Self-Sufficient Community, Ashram, Eco-Village, Personal Growth (Retreat) Center, or Household. I play musical instruments - different styles of music - and do artwork. In addition to working, I feel my main contribution would be playing soothing, relaxing piano & electronic music, and want to live in a place where this would be regarded as beneficial and welcomed. I'd prefer being in Cal., Ore., the N.W. or S.W. states, or possibly in another country. - Thanx - Jay 831-479-4560

POWER TO THE PEOPLE: T'SOU-KE NATION'S COMMUNITY ENERGY SOLUTIONS

(continued from p. 23)

Ministry Natural Resources Canada (NRCan) towards retrofitting 1,000 houses in Colwood Municipality using the lessons that T'Sou-ke had learned and integrated into a simple but effective energy strategy.

Net Zero Energy Strategy

Power is political and many energy projects throughout the world, from oil to nuclear, depend on government support and subsidies to make them financially sustainable. Due to existing commitments to fossil fuel-based industry and energy production, many governments will not support renewable energy programs. The energy strategy that Solar Colwood and T'Sou-ke has developed is aimed at making renewable energy projects anywhere sustainable now without government subsidies. The concept is simple and is based on an Energy Planning Hierarchy that encourages the owners and users of buildings (whether home, school, office, hospital, community, etc.) to start with the most simple and cost-effective conservation interventions to reduce demand, and only then proceed to the more expensive renewable energy supply solutions.

A. The low hanging fruit of conservation: e.g. passive solar, extra insulation, weather stripping, efficient appliances, energy audits, energy phone apps that give constant feedback on what energy is being used and lost, and most of all changing habits—turn it off.

Low cost—high savings.

B. Space heating leads to the largest single area of cost of power. Using efficient, ductless heat pumps (1 kW in gives 4 kW out) can create huge savings—even with outside temperatures down to minus 25 degrees.

Medium cost—high savings.

C. Hot water production through Heat Pump water heaters uses time proven technology to cut energy consumption by half.

Medium cost—high savings.

D. Only now introduce Renewable Energy—Solar, Wind, Geothermal, etc.—on supply side as demand has now been considerably reduced. The amount of renewable energy can be limited to a "net zero" equation through a net metering arrangement with the local utility. Surplus energy produced in summer and sold to utility will be bought back in winter to produce a net zero energy use and bill.

High cost—medium supply.

This strategy has persuaded BC Ministry of Energy to introduce a PAYS Pay As You Save program which lends consumers the capital to carry out the energy conservation and production measures described. The consumers pay back only an amount equivalent to what they save on their electricity bill each month.

After approximately 10 years the capital will be paid back and the building will have no more electricity bills—**ever!**

Andrew Moore is an architect who specializes in community development. He has worked extensively with all levels of government, the private sector, and grassroots organizations in Canada, the UK, and South Africa over the last 30 years. For the last seven years he has been employed by the T'Sou-ke Nation on Vancouver Island to transform its community vision into a reality.

communities.ic.org

GOING FOR THE GRID: A COMMUNITY DITCHES ENERGY INDEPENDENCE TO GET GREENER

(continued from p. 29)

collective discussions on how a grid-tie will alter our lifestyle and legacy. It's taken all we have to manage the pipe trenching work ourselves to lower costs. And to keep up with the vast and fast-changing information, deadlines, and decisions—loan payments, community dues increases, and a few crux moments requiring consensus from the four community households when members were spread all over the country on summer vacations. Many members admit they've been holding their breath, wondering if logistics would get in the way of seeing the project to the end.

They nearly did get in the way. Along the course of these fast-moving several months, balls were dropped, papers weren't read closely enough to catch important details, and neighbor relations nearly blew sky high—enough that several parties were ready to pull the plug on the project, no pun intended as it really wasn't all that funny how one oversight threatened to break a 15-year relationship between households.

And—we persevered. Walker Creek is committed not just to being an experimental ground for alternative technologies, but also to "principles of human cooperation and...the growth of a new culture and society." Community relationships remain intact. The email just arrived today: "PSE is coming Thursday to do the final hookups and then we'll have electricity!" writes Tim Nelson.

As for exactly how Walker Creek will evolve with electricity and with re-defining ourselves as a model for sustainable energy...stay tuned. A new courtship with power has just begun. Soon, we write our vows.

This article was written using sunshine juice, with the occasional backup of a propane generator, a cursing husband, and the generous support of a Mount Vernon Library power outlet. Sarah J. Stoner is an American-born writer who was raised in Uganda, Morocco, Belgium, and Thailand. With nearly half her life spent spanning cultures, Sarah is now learning the language of staying put, growing her own food, running a household on solar power, and listening to the creek rush through her front yard. She explores identity and belonging at sarahhhwho.blogspot.com.

ENERGY EFFICIENT HEATING, RENEWABLE ELECTRICITY, AND COMMUNITY RENAISSANCE AT ZEGG

(continued from p. 37)

intimacy, after years when most here strove mainly for intimacy with a partner or with self. If it becomes strong, it will rekindle and reawaken our communication and transparency skills and practices, which have lain underused or dormant.

New Soil

One recent practical idea is kindling enthusiasm now—reawakening a longing to be of relevance for the world around us. We are working on a plan to replace all our flush toilets with dry separating toilets, using the urine and faeces in Terra Preta soils to restore fertility, save lots of water, and sequester carbon from the atmosphere (partly in biochar produced from organic waste materials). The grey water from showers and sinks would be cleaned and reused for irrigation and washing machines, turning us into a wastewater-free model settlement of the future.

I believe this would also bring us to more individual sustainability thinking and choices in our "private" lives. In many moments I can hear and feel the renewed change and the longing for yet a more coherent path together. So stay tuned!

Born in 1959, Achim Ecker is a trained social worker who values deep caring, compassion, and love for people and life. In the 1980s he was an intern at the Resource Center for Nonviolence in Santa Cruz. At ZEGG he is the chief Permaculturally-trained landscape designer and ecobuilder. For the last 20 years he has been teaching integral Forum and awareness training in German, English, and Spanish. Visit his website at www.zegg-forum.org.

(continued from p. 80)

honor at the White House this year. OSE aims to make important agricultural and industrial technologies available to the average person by providing free blueprints to build such machines with common tools and materials. His goal is the GVCS 50, otherwise known as the Global Village Construction Set, 50 machines crucial to creating a small, sustainable civilization from scratch. The LifeTrac tractor is one of these. Ian documented the OSE crew's first prototype, which eventually broke due to a design flaw. Undeterred, they vowed to try again.

What would happen if these two men were to meet, we wondered? What could they do to help each other, if anything? What would be the catalyst to make it happen? The answer was the LifeTrac. Nat's farm needed a tractor. Marcin knew how to make one.

A Tractor for the Global Village

Imagine a tractor so simple it could be built in your garage in a week. Imagine if this tractor could be built out of local materials. Imagine using this machine to build your own house or grow your own food. Marcin not only imagined, this, but engineered it and set out to bring it into being.

The real obstacles to progress lie in our ability as leaders to communicate, and as team members to trust and collaborate.

It was at Open Source Ecology's homebase, Factor e Farm, that the ambitious build of the LifeTrac tractor version 5 took place in July 2013. The building team consisted of inexperienced volunteers, and the finished tractor would be donated to the school in New Orleans.

The Lifetrac tractor is arguably the backbone of GVCS 50. It features a modular design and detachable powercube unit, an engine coupled to a hydraulic pump. The concept is that the GCVS 50 works like a lego set: the pieces from one machine work and interchange with pieces from another. Together, they help build a production toolkit for low cost.

Evolution at Factor e Farm

For the pinnacle build of the LifeTrac 5, the centerpiece of our film project, nothing was certain. "There was so much riding on this build and there was no assurance that it was going to be successful, or even work once we finished it," Ian told me, "It was a prototype and had never been made before. What would happen to the end of the film if there was no success—how was I supposed to tell an inspiring story? What if someone got injured? It would be such a crushing defeat to bring all of these epic characters together and fail."

When Ian first filmed at Factor e Farm, conditions were rustic, to say the least. He stayed in a small village of particle board huts, freezing as the fall turned to winter. Mice cohabited with people. Solar panels and a small gas generator provided the community's power. Water was collected in barrels on the roof of the small, earth-brick workshop, veritably off-the-grid in every respect. "It was a survivalist sort of a place where you were really connected to the resources," Ian remembers. "So if you were using too much electricity, the power would go out. It was a good experience but it was limiting as far as building machines." The conditions also limited the type of people who would come work at the farm.

By this past summer, Factor e Farm had modernized substantially. With the help of grant money they had built a big on-the-grid workshop, as well as the Hab Lab, a living unit of 12 rooms, constructed with compressed earth bricks from soil right on the property. There was running water, and things like rice and beans available for volunteers in the kitchen.

Challenges into Opportunities

Yet improved infrastructure alone never guarantees success. Ian and co-producers Siku Thompson and DJ Turner observed upon arrival in Missouri that volunteers were struggling with low morale, communication issues, turnover, and a lack of cohesion in their ambitious project. It was too much for Marcin or anyone else to spearhead alone. The film crew itself took a role in bringing the group together—with remarkable results.

"We set clear goals," DJ told me, "and felt like we were making headway. But no one in the group had ever built a tractor before, except Ian, who was behind the camera. It was a shot in the dark, figuring it out as we went."

"I established three meetings a day just to catch up with everyone," Siku reflected. "I began talking to everyone at OSE about why they were there, and the expectations that they had. Then we would say, 'Right now we have the opportunity to successfully build something that will make your time here worth all the effort.'"

The tractor build was a culmination of the difficulties, challenges, and also promise facing world-changing projects like these. Open Source Ecology is almost literally trying to reinvent the wheel. To do this is a tremendous opportunity for discovery, not only from a technical standpoint, but on a human level.

The Real Obstacles to Progress

Building a tractor from scratch is difficult. But what *The Spark* has found is that the real obstacles to progress lie less in our abilities to produce, and more in our ability as leaders to communicate, and as team members to trust and collaborate. We saw it in the microcosm of our experience in Missouri, and we see it at the highest levels of power within our current global conflicts. We're not going to move toward a healthier society by force, but by openness, which is what building something together requires. When we embrace this approach, success can be very sweet.

When I talk to OSE collaborator James Slade *(see sidebar)* as he's ramping up his own maker community, and witness the interest from projects like Our School at Blair Grocery, I feel optimistic. At the very least, the various prototypes and their blueprints will live forever on the internet. The newest and sixth prototype of the LifeTrac is currently in development.

Christina Heller is a journalist turned documentary filmmaker. She started at 88.9FM WERS, where she won two AP Awards for her weekly politics program, You Are Here. Her transition to television with WZMY had her producing, shooting, editing and anchoring My Voice, another politics show. She covered the 2008 presidential primaries for both WZMY and Al Gore's Current TV, and was featured on Good Morning America as a commentator on Generation Y's impact on the 2008 election. Her debut documentary, Libertopia*, is currently in distribution by CRM's FilmBuff, and was featured on FOX Business, HuffPost Live, and NHPR. She is now Executive Producer of* The Spark. *Follow the film's progress at www.thesparkfilm.com.*

Behind the Scenes of the Construction Set

One big player is James Slade, an OSE replicator and collaborator. He was instrumental in the LifeTrac 3 construction during Ian's first shoot, and ended up leading the build of the recent LifeTrac 5 prototype to such a degree that he is now a project manager at OSE. He recently finished construction on a 2,500 square foot workshop in Tennessee called Cumberland Tech Village where he intends to improve the functionality of the LifeTrac, as well as help define its true function.

"Marcin wants to develop a platform into which someone can invest their time and energy, and have it do everything," Slade says. The LifeTrac 3 is a classic skid-steer, a jack-of-all-trades tractor designed to "do all kinds of stuff," but not especially good for agriculture. It also costs about the same to build from scratch as it would cost to buy a secondhand Bobcat, its closest equivalent on the market. Hence the continued evolution of the design.

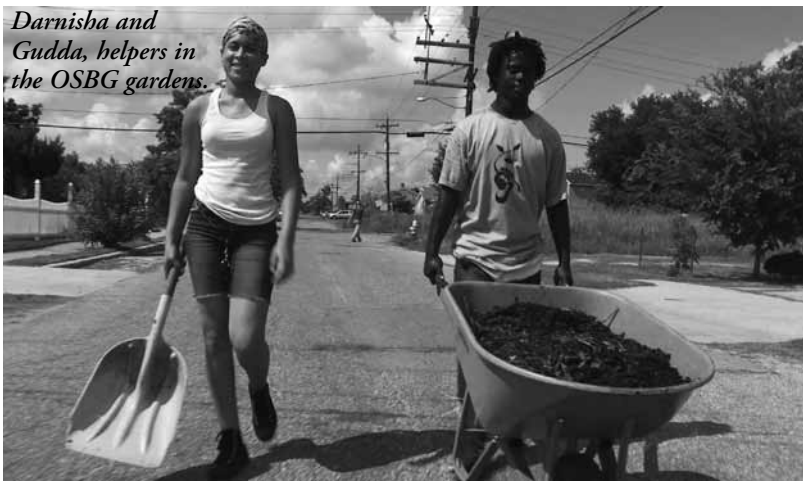
One advantage of the LifeTrac comes in the ease of repair—if you build it, you can repair it. And since Jakubowski sources his parts locally, the LifeTrac is completely American made. That kind of control is appealing for people disillusioned with the long chain from production to consumers, and is more fun for the DIY-inclined. In the future the LifeTrac will work best when it functions as just one machine in a family of OSE products, where the detachable, interchangeable parts decrease costs overall. For now, the GVCS 50 is embraced mainly by the alternative builder community—"makers," as they are sometimes called.

The LifeTrac and other OSE tools are part of a bigger open source production philosophy: those who produce within the community are rewarded. In the open source world, information has no value beyond how it can serve production. Information and innovations are shared openly and freely. For OSE, this seems to work, as more people from around the world test the blueprints and report their feedback on the OSE wiki.

The most successful prototype of the GVCS 50 so far is the Compressed Earth Brick Press. Slade was the first to replicate the CEB Press in 2011. Since then, they've been replicated in places such as China and Africa. "The CEB is spreading because it works, people can use it right away, and they've already converted it from standard to metric. It's a success and rolling," Slade says. But it's the LifeTrac that captures his imagination. "It's the reason I got involved with OSE to begin with. I saw Marcin's TED talk and I was like, 'I've gotta do this.'"

—C.H.

Nat Turner, coordinator of Our School at Blair Grocery in New Orleans.



Darnisha and Gudda, helpers in the OSBG gardens.

RENEWING THE HUMAN SPIRIT

Igniting the Spark and Maintaining the Flame

I sent the film crew to Missouri with a journal. It was 100 pages thick and empty, save for a good-luck note I wrote on the first page. What I got back was six pages of journal entries and eight pages of production notes on the tractor build, indecipherable scribblings about bits, powercubes, foot pedals, and workflow. The powercube, engine, and scheduling take up the most page space, though there is alarmingly talk of explosions on page nine. It turns out that building a tractor from scratch with an inexperienced team of volunteers leaves little time for contemplative writing.

I've been working on this film, *The Spark*, since February of 2012, the first producer to sign on to the passion project and debut feature documentary of filmmaker Ian Midgley. He came back to Los Angeles with 300 hours of footage from his journey on the road, where he'd lived out of his car, following an underground, word-of-mouth network of our country's leading sustainability activists and pioneers. Amidst hundreds of conversations and scenarios, two men had captured his imagination, and it was around them that he would build his epic: Nat Turner of Our School at Blair Grocery in the lower Ninth ward, and Marcin Jakubowski of Open Source Ecology in Missouri.

Nat runs OSBG (Our School at Blair Grocery), an alternative education center in New Orleans' hardest-hit neighborhood. He teaches the local kids, using urban farming as the focus for what is actually high-level critical thinking and empowerment. In addition to teaching them important life skills, the produce serves a tangible purpose within a neighborhood without a local grocery store. Ian and Nat bonded as he filmed the organization's challenges, setbacks, and successes.

Marcin runs OSE (Open Source Ecology), which broke into the mainstream with a 2011 TED talk, and which along with other national profiles, culminated with Marcin receiving an

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Marcin Jakubowski of Open Source Ecology in Missouri.

Filmmaker Ian Midgley with the finished LifeTrac tractor.

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