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Weaving Roots Volume 1,
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Weaving Roots

*Green Living Journal
of Middle Tennessee*



Green Living Journal to debut at the June 2 Sonnenschein Festival! Weaving Roots, Middle Tennessee's very own biannual journal for green living has been produced by the Center for a Holistic Ecology, *CHE* as part of the Local Economic Development and Green Education, *LEDGE* Initiative. *CHE* is a 501c3 non-profit organization in Lewis County, TN. *CHE*'s missions include environmental education, community development and networking, land and resource conservation, and consumer advocacy. In 2004 *CHE* teamed up with (please read more on page 20)

This Saturday, June 2, in Hohenwald TN, the second annual Sonnenschein Festival will have music, nature, alternative energy and art! This year's festival will be the biggest Green Power Festival in Middle Tennessee. It will include 25 green power speakers, an alternative vehicle and fuel exposition, two music stages powered by solar energy, a tour of alternative homes, an energy play shop for kids, an eco-film fest and much more!! The festival opens June 1 with an Ecovillage Experience Weekend at the Ecovillage Training Center on the Farm Community in Summertown, TN and Cumberland Greens Bioregional Council Gathering. There will be tours of The Farm, community dinner and music Friday night. The festival ends with Sonnenschein's Sunday Tour of Alternative Homes. Join us for a

Sonnenschein Festival in Hohenwald

sunny Sunday tour to visit ecologically conscious homes in the area! The Global Village Institute of Appropriate Technology, *GVI* will be offering the tour of homes in Middle Tennessee on June 3, 11 am - 5 pm. The festival and tour are free to the public! The tour will visit more than 10 homes, showcasing solar power off-grid and grid-tie, wind power, passive solar, natural building, solar hot water heating, biofuels, Permaculture gardens and

more! The tour will commence at The Farm's Ecovillage Training Center in Summertown, TN.

Please contact ecovillage@thefarm.org or call 931-796-4874 to register.

The tour is free unless you need shuttle transportation, lodging or meals, which are available upon registration. This tour is a participating member of the American Solar Energy Society. You can find out about other tours at: www.ases.org



We Can Do This!



**Hohenwald's 2nd annual
Sonnenschein Festival**

Green Power: definitions for a wealthier future

Editors Column

By Jennifer Dauksha English

We likely all know the hot issues right now: climate change, peak oil and energy independence. This journal is intended to educate readers about both energy related concerns and working solutions, with informative articles on strategies for individuals and businesses to cut their energy consumption. What does Green Power mean? Looking at this holistically, I have three definitions: Appropriate Renewable Technologies, Personal Purchasing Power and Local Economic Development. Here's an overview of the three types of articles you'll find in future columns.

Appropriate Renewable Technologies: If you googled Green Power you'd find a lot of information on the production and consumption of renewable energy technologies such as wind, solar, biofuels, waste methane and hydroelectric. Appropriate technology means more than just producing power. It also means utilizing efficient technologies that

generate the least amount of waste for the highest yield, taking into account both the social and ecological costs within a local economy.

All around the world people are faced with the rising cost and decreased supply of petroleum and other non-renewable resources. There's also been an increased awareness in the effects of carbon being released into the atmosphere from the burning of fossil fuels, which the UN has announced on February 2, 2007 with more than 90% certainty, as the cause of the global warming we're experiencing. Due to these changes, private homeowners, corporations, Universities and entire municipalities and nations are choosing to purchase green energy or install on-site systems. In the U.S., the Whole Foods Grocery and the Environmental Protection Agency both get 100% of their electric energy from green power sources.

Homeowners like myself are doing what we can to not only cut our energy costs but to also decrease our carbon footprint on the planet. My husband and I get 90% of our home power from solar, wind and wood and we drive a used hybrid electric car and own a diesel truck that runs on waste vegetable oil. Our home utilizes passive solar design and we chose to use salvaged or renewable construction materials whenever possible.

That brings me to **Personal Purchasing Power.**

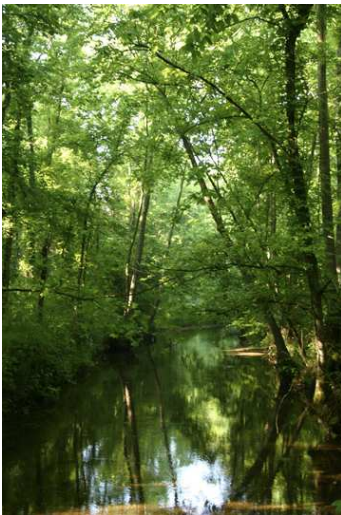
Every time you spend one of those green dollars, you as the consumer are supporting the producer. Individuals and groups can support strategies that encourage the use of renewable resources and lessen the dependency on non-renewables such as petroleum and coal. Green Power strategies include: organic farming, the use of herbal medicine, choosing paper instead of plastic and the old R's: reduce, reuse and recycle. Yet most of all we can support businesses that have chosen green power for their production process, materials, packaging, shipment, the processing of their residual waste and/or based on what they do with their profits. This is especially powerful when the producers are a part of our community. Grass roots efforts and not-in-my-backyard campaigns across the nation have kept businesses in-check from polluting toxic wastes into neighborhoods. Green business solutions and purchasing guides are available online.

My third and favorite definition is **Local Economic Development.** These development strategies encourage both the local production and consumption of goods and services. This enables local consumers to lessen their dependency on goods shipped from out of the region, while at the same time

strengthening not only the local economy but also the sense of community.

Green local economic development strategies also take social and ecological costs into analysis. These strategies include community supported agriculture, farmers markets, cooperatives, programs that support human needs from birthing centers, preventative care and all the way through the care of the elderly, locally owned and operated businesses and economically viable activities that promote the enjoyment and protection of local land and resources.

This third definition also links to the consumption of non-renewable resources and takes us back to the power of photosynthesis. Cornell University Professor David Pimentel provides agricultural statistics in *Food, Land, Population and the US Economy*. Did you know that the U.S. uses 10 quadrillion BTU's of energy each year in getting food to your table? That's more than 400 gallons of petroleum per person. Large-scale field machinery and transportation consume 35% of this energy. Where does your food come from? How many BTU's are you consuming by eating an apple from Washington instead of Tennessee? How many local jobs could we create if we bought twice as much local food?



Solar Hot Water

By Doug Kalmer

Hot water represents the second largest energy consumer in American households. A typical 80 gallon electric hot water tank serving a family of four will consume approximately 150 million BTUs in its seven year lifetime. This will cost approximately \$3,600 (at \$0.08 per KWH), not accounting for fuel cost increases. Then it will be replaced by another one just like it. It's time to rethink this.

One of the most cost-effective ways to include renewable technologies into a building is by incorporating solar hot water. A typical solar water-heating

system reduces the need for conventional water heating by at least two-thirds. It minimizes the expense of electricity or fossil fuel to heat the water and reduces the associated environmental impacts.

There are four main reasons why heating your domestic water with the sun makes so much sense. 1. It is a proven method. There were about 50,000 solar water heaters in use in Miami, Florida alone from the late 1930's to the early 1950's. Most were replaced by pipelines bringing inexpensive natural gas. 2. It is a year round application, your family



uses hot water every day. A typical family of four spends about 40% of their utility costs on water heating. 3. Solar energy gathered during the day can be stored in an insulated tank to provide hot water long after the sun has gone down. 4. It is cost effective.

An investment in a quality solar water heating system will beat the stock market any day, any decade, risk free. Initial return on investment is on the order of 15 percent, tax-free, and goes up as gas and electricity prices climb. Many states have tax credits and other incentives to sweeten those numbers even more. There is a Federal tax credit now in place. Forget the stock market. If you have invested in a house, your next investment should be in solar hot water- If you have solar access, and two or more people in your household.

When you invest in a solar water heater- your home's equity value increases with your investment. It is an income generator that keeps producing a positive non-taxable cash flow to you. It uses non-polluting free solar energy. It at least doubles the amount of hot water avail-

Green Building is Green Power

By Howard Switzer & Katey Culver

How does green building relate to green power? Buildings today consume nearly a third of our nation's energy. Building materials comprise a 5th of the waste stream and 40% of all the materials extracted from the earth. That represents a lot of energy cost which can be reduced with Green building design.

There are two general aspects of a product or material used to determine whether or not it is green. One is its toxicity, the other is energy. Green materials are non-toxic or of a greatly reduced toxicity so as to not pollute us or the environment with their manufacture or use. The energy aspect refers to the amount of energy used to

manufacture the product or the amount of energy the product saves or uses. Green Power uses renewable fuels and taps into natural forces such as sunshine, the wind or water flow and gravity to produce electrical or mechanical energy. A Green Building utilizes materials and methods which do not pollute the environment, or harm its inhabitants, and utilizes less energy in both its production and use. All construction is destruction to some extent so the green builder's task is to minimize the impact while creating a safe, healthy home that uses less energy.

Green building is becoming more important today with the steadily increasing cost



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Howard Switzer, Architect Katey Culver, Designer
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of energy to run a home. Half that energy is used for heating, 70-80% of which can be saved simply by utilizing passive solar design and orienting to the sun. Green building design extends to our communities as well, which can influence another third of

our energy used in transportation. Building and development decisions therefore offer abundant opportunities for saving energy and natural resources as well as reducing environmental impacts.

Recycling Saves Energy

By Cynthia Rohrbach

Recycling is widely accepted as a way for businesses, organizations, and the general public to help conserve raw materials that are used to make everyday products. Recycling paper and cardboard allows paper mills to use a larger percentage of waste paper in the manufacture of new paper products, saving 17 trees and 7000 gallons of water for every ton of recycled paper. Recycling aluminum and steel avoids extraction of metal ores from the earth. With petroleum being a major ingredient of plastics, recycling plastic has an economic benefit.

Recycling also provides the important environmental benefit of saving energy. Typically, using energy means burning non-renewable fossil fuels, which releases pollutants and greenhouse gases into the air. Mining and refining new raw materials are very energy intensive processes.

Consider these energy-saving facts about recycling:

Recycling paper cuts the energy usage of paper-making in half. Including recycled paper into the manufacturing process reduces air and water pollution. We throw away enough paper in the US every year to make a 12-foot high wall from New York to California. Paper makes up 40% of municipal solid waste. Global paper use has grown more than six-fold since 1950.

One fifth of all wood harvested in the world ends up in paper. Pulp and paper is the 5th largest industrial consumer of energy in the world, using as much power to produce a ton of product as the iron and steel industry. (Worldwatch Institute)

Steel is the most commonly recycled material in the world. It can be recycled over and over. Steel can be distinguished from other metals because it is magnetic. Every pound of steel recycled saves enough energy to light a 60-watt bulb for over 26 hours. (Steel Recycling Institute)

Recycled glass requires only half the energy needed to make glass from new raw materials. Glass can be recycled an infinite number of times, and 41 billion glass containers are made every year. Recycling one glass container saves enough energy to light a 100-watt bulb for 4 hours. (EPA)

Recycling aluminum cans saves 95% of the energy needed to produce aluminum from bauxite ore. Four pounds of bauxite ore are saved for every pound of aluminum recycled. Enough aluminum is thrown away to rebuild our commercial air fleet 4 times every year. Recycling just one aluminum can saves enough electricity to run a TV for 3 hours. (Reynolds Metal Company)

According to the EPA, recycling a pound of plastic



Students at Croft Middle School in Nashville collect paper from classrooms for recycling. Paper and cardboard make up the largest portion of waste streams from schools.

saves enough energy to light a 60-watt bulb for 57 hours. If we recycled every plastic bottle sold, we would keep 2 billion tons of plastic out of landfills (Penn State). Better yet, re-use plastic containers over and over before recycling.

Imagine how much energy and raw materials could be saved if everyone recycled paper, glass, aluminum, steel, and plastic! Lewis County citizens can recycle metals in Hohenwald, and they can take other recyclables to a Maury County Convenience Center. It would save more energy to have recycling available locally.

Bioregionalism By Eric Lewis

Bioregionalism is simply a way of looking at the earth in local bite-size pieces. We all live in bioregions—areas that share distinct historic, cultural, geographic, plant and animal characteristics—and yet, unlike states or countries, are small enough to relate to. A bioregion may be the size of a few counties and may include parts of different states. It may be that you have more in common from an ecological perspective with people in south-central Kentucky than you do with folks in Memphis.

It is difficult for the average person to make a difference at the State Capital, much less in Washington. In our communities we can be heard and we can see what is going on. We know what trees grow in the woods and what is possible to grow in the garden. We know the big rivers and creeks, and we know the history of the area.

Taken one step farther, the residents of each bioregion can become largely self-sufficient, growing and distributing our own food instead of importing it from California. We can keep the trees we have for our own lumber instead of supplying Japan with computer paper. And at the same time we can protect our clean water and our native plant and animal populations for future generations to enjoy.

Food to Grow On by Jeff Poppins

Green power depends on solar energy. Photovoltaic cells are similar to leaves, with the conductive silver wire imbedded in the non-conductive silicon, looking like the veins of a leaf. One side of the solar cell is coated with a high valence material, like boron, and the other has a low valence material like phosphorus on it. The extra electrons in the outer shells of the boron atoms get excited by sunlight, and try to jump through the silicon to join the phosphorus atoms, whose outer shell is lacking electrons. Instead they find the silver wire, and are whisked away to a storage battery and used as electricity. We call this green power because it's a non-polluting, renewable source of energy. The farm also uses green power, but the old fashioned kind - photosynthesis. Like solar cells, leaves transform sunlight into green power, but instead of electricity, they are making food. All of the world's renewable wealth is its annual growth of plants and animals.

Traditional cultures revered the four elements: earth, water, air and fire. The farm's soil is the earth, and on to it the rain, air and sunlight fall. The art of farming consists of properly managing these forces. When food is produced on the farm using no other inputs besides the rain, air and sun that are given to it for free, we call it organic farming. The farm is blessed with a powerful, green forest that hasn't been logged for several generations, and we are committed to preserving it. Almost two hundred acres of woods surround a dozen meadows containing about 100 acres of grass, clover, and 30 head of cattle. The forests of the farm supply valuable forces for the pastures from trees, undergrowth and mushrooms to the birds, insects and wildlife. The wide diversity of activities promotes health. With miles of edges, where forest and field meet, many species interact and a lively communication and transference of energy takes place.

A cow is a very special animal because she can fertilize four acres of land while living off of only two acres. Wise men forbade the eating of cows for this very reason; the land had to have cattle on it to remain able to support humans, and they didn't want the cows to disappear in years of famine. The farm needs the proper amount of cattle to keep the pastures picked down, and to supply fertility. The plants that cattle eat (grass and clover) are nature's best soil builders.

During May and September, the farm produces more growth than the cows can keep up with, so we cut, rake and bale about 150 rolls of hay. If the farm didn't have cattle, and we sold the hay, we would be exporting our fertility away. In traditional land leases, it was illegal to sell hay, but you could raise and sell as many animals as you wanted. This insured that the land would stay fertile and healthy.

After the cattle are in a meadow for a while, they get moved to a new one. The grazed meadow is allowed to grow back before it sees the cows again. This resting period without animals is as essential for the farm's health as is the necessity of having cattle on the farm. Grazed or mown grass forms humus as the roots die back and re-grow. In the wintertime we feed the hay to the cows, and they make a mess. I scrape up the old hay, manure and a little soil to make big compost piles, and into them I add homemade biodynamic preparations. After about a year, the compost is spread on the nearest garden plot.

The farm produces about 75 tons of compost each year, and this is used to fertilize 5 acres of vegetables, at the rate of 15 tons per acre per year. When you use that much biodynamic compost, vegetables grow great, and insects and diseases rarely cause problems. A stable humus is formed, teeming with beneficial microbial life, which really help the garden produce heavy yields of healthy food. The farm grows a lot of cover crops, too. For 25 years, about 50,000 pounds of produce leave the farm annually, along with a few calves. What is this food that the farm exports made of? It is carbohydrates, starches, sugars and proteins. What are these made of? Carbon, hydrogen, oxygen and nitrogen. Where do they come from? The air above the farm is hydrogen and oxygen, and carbon is in all life processes.

The farm simply transforms sunlight via photosynthesis, into plant growth, using the air and water that fall freely on the earth. It's no wonder ancient civilization revered these four elements and the sacred cow that makes it all possible. There are a few exceptions to the no input rule. Because Tennessee's soils are so old, re-mineralization really helps. I don't have time to wait for a glacier, so we do use rock powders like lime, rock phosphate and granite meal. These ground rocks become part of the soil food web, and eventually can be utilized by plants. The other exception would be the labor saving machines I use, tractors, trucks and their fuel and upkeep. The farm's green power gets distributed to about 100 families. In return, they give us green power, in the form of money, a seeming necessity for life in the 21st century America. Just as sure as the sun will rise and make green power from solar cells, the farm will grow green with the power of earth, water, air and fire, and continue to provide food.

Biofuels, powering automobiles into the future

By Jason Deptula

There are a lot of new things happening lately regarding the rather old subject of plant-based fuels. I will try to help make sense of some of it, and point out some little known facts. My vehicle has been powered by filtered waste-frying oil from our area eateries for about two years now. That fact has put me on the four o' clock news twice so far. The car is a diesel Volkswagen. Rudolph Diesel introduced the compression-ignition (diesel) engine in 1898, in France. It ran on pure peanut oil. Yes, over a hundred years ago, his intention was to make a hard-working engine that would run on a fuel that the farmers could grow themselves. He did not live to see that vision, however, and for over a century we have had to use the non-renewable petroleum based fuel named after him.

Now the state of Tennessee is gearing up to lead the way in biomass production for green energy. For example, plant oils, like from soybeans grown in Tennessee, are being made into "Biodiesel," using a process that changes its viscosity to closely match petroleum diesel fuel. With Biodiesel, little or no modifications to diesel equipment are necessary, and Biodiesel can be blended with traditional diesel. I modified the fuel system of my VW to accommodate the thicker plant oils, thus saving me from the process of making

Biodiesel. Commercially produced Biodiesel is available full strength in our neighboring Lawrence County for about the same price as regular diesel.

Going back one hundred years again, we find that here in the U.S., there were more backyard stills than gasoline stations. The first assembly line production vehicles in the world were running on pure alcohol. Then came prohibition, and now, higher prices at the pump, along with an unstable Middle East. This leads us back to a closer look at domestically produced renewable fuels. For several years now, a number of American-made autos can be found at the dealer that are "flex-fuel" ready. This means they will run on ethanol (alcohol) or gasoline in any proportion. There are now over a thousand fueling stations across the states that offer "E-85," a blend of 15% gasoline with ethanol from our corn surplus. It is about 70 cents cheaper than regular gas. There are also simple conversion kits for most modern vehicles to run on straight ethanol. I plan on trying out an ethanol conversion this year.

Both Biodiesel and ethanol have much cleaner emissions than the petroleum fuels they wish to replace. The expanded production and use of these alternatives, especially in urban areas, will help reduce the negative health effects caused by exhaust emis-



Jason Deptula and his Volkswagen he converted to run on vegetable oil

sions. The more we choose the cleaner alternatives, the less petroleum we need to import from hostile areas of the world.

We are off to a good start as a nation as we gear up for renewables, but we do have a long road ahead of us. It seems impossible to most people that we could grow enough crops to supply our stomachs and our fuel tanks as well. This is true if we stick with corn and soybeans as our primary feedstocks. There are higher yielding plants, and some of them aren't even food crops. For example, switch grass is being tried out successfully to make ethanol, and pond algae, of all things, can yield large proportions of oil for Biodiesel.

We will also have difficulty meeting demand with renewables unless the technologies become much more efficient, both for production and consumption of fuel. Most cars in the U.S. average around 20 mpg of gasoline.

My Jetta gets around 50

MPG on veggie oil or diesel. If it were a hybrid-electric, it might be able to go seventy miles or more per gallon. Do we have to drive everywhere? Our national consumption rate would plummet if we went back to the light rail system for passenger travel, and utilized freight trains instead of eighteen wheelers whenever possible. Our infrastructure has been geared toward the individual car and truck, and this is most inefficient.

So what can we do as individuals who aren't directly involved in the biofuels industry? The biggest difference we can make is with our lifestyle choices. My lifestyle is such that I can ride my bicycle to work, and that is a big key to making this transition away from petrol-fuel a success.

The more ways we can find to get what and where we need without cranking up the engine, the closer we are to closing the gap.

Organic Agriculture and the Future of Farming by Frank Michael

Are you paying \$40 to fill your gas tank? The rising price of gasoline is a harbinger of inflated food prices. Fertilizer, herbicides, and pesticides are all made from petroleum, and so is the fuel for farm equipment. The factories that make tractors, combines, and parts also depend on electricity made from oil and coal.

The small farm is becoming extinct as a result of competition with agribusiness and imports from countries with extremely low wages. The stress on small farmers is terrible - many work second jobs just to keep from losing the farm, which sometimes has been in the family for several generations. So at this time it would be prudent to examine some alternatives to industrial agriculture.

Organic Farming uses natural fertilizers, smart crop rotation, and companion planting to grow chemical-free, nutritious, and flavorful organic produce. The productivity and profitability can be equal to or better than that of a "traditional" farm that depends on herbicides, pesticides, and fertilizers. People are increasingly willing to pay a fair price to the farmer / distributor for the health benefits and intense flavors of organics. Community-supported agriculture (CSA's) and co-ops allow farmers to share knowledge, transportation costs, and provide more variety for their customers.

"Green manure" crops like cow peas, crowder peas, and many beans convert nitrogen from the air into soluble nitrates. These legumes are grown knee-high, lightly cross-tilled, and the crops are planted right on top, so the rotation does not require a full 1/2 and 1/2 time. No more hauling manure!

An extreme case of downsizing is Square Foot Gardening. The book is the all-time gardening best-seller in the US, with over 800,000 copies sold worldwide. It shows how to grow organic produce on 1/5 the area of a row garden, requiring 1/5 the water, and less than 1/5 of the labor. Its 4' x 4' squares need only hand tools and takes minutes a day, ideal for townspeople and greenhouses. There is no need to work the existing soil; just fill 6" high beds with a 33% compost mixture and plant the seeds. Thereafter you add a trowelful of compost whenever a plant is harvested. It makes one wonder if we're going back from farming to gardening. It's certainly easier than the backbreaking labor of our grandparents who used mules, oxen, and hoes.

Integrated energy/food organic farming grows both food and "smart" biofuel crops like sugar beets, fodder beets and sugar cane. This requires an ethanol plant nearby - any farther than about 20 miles reduces profits. You can also buy their distillers' waste, slurry or DDS (dried distiller solids), which is a super-fertilizer and herbicide.



"To live more voluntarily is to live more deliberately, intentionally and purposefully—in short to live more consciously . . . Voluntary simplicity is a manner of living that is outwardly more simple and inwardly more rich, a way of being in which our most authentic and alive self is brought into direct contact with living."

*Duane Elgin in
Voluntary Simplicity*

The Man in the Grey Flannel Suit

by Albert Bates

Take yourself back to the 1950s. The man over there in the grey flannel suit, thin mustache and hair parted down the middle, is a Shell Oil geologist named M. King Hubbert. Hubbert said that while the USA may never actually run out of oil, or even find it all, we will reach a point, probably about 1970, when we can no longer produce any more than we did the year before.

Hubbert had spent several decades studying Texas oil fields and he had noticed a distinctive pattern. At just about the point when the reservoirs reached half-empty, the well-head pressure dropped, and the quality of the oil declined. It became more tar-like. It was like sludge at the bottom of a barrel. At just about the halfway point it became more expensive to get out, and more expensive to refine. Watch out for that point, he said.

All oil fields eventually reach a time in their life when they become economically foolish. If it takes the energy of a barrel of oil to extract a barrel of oil, then further production becomes pointless. The pattern Hubbert observed held true for individual wells, for entire fields, and for countries. No amount of extra drilling or new technology would change these fundamental patterns, Hubbert said. Once we get to halfway, the change is gradual but unavoidable. It came to be called "Hubbert's Peak." In the oil industry, Hubbert's Peak was greeted with hoots and cat-calls. Hubbert was called unscientific, Chicken Little, and a quack.

Then came 1970, and just as predicted, the halfway mark was reached in the known reserves of conventional petroleum in the USA. A decline in production began. It was briefly interrupted in the late 1970s by new oil finds in Alaska and elsewhere, enabled by computer technology, but those made only a slight bump on the general downward sloping curve. Every year after 1971, the USA has become more dependent on imported oil, and less able to produce from anywhere under our feet.

Last year there was a big hullabaloo about a new well Chevron had found in the Gulf of Mexico. It was a biggie, all right. Three to fifteen billion barrels. It was also an engineering marvel, because it was 250 miles offshore, in 7,000 feet of water and the test well extended more than 22,000 feet deeper into the seafloor. Nothing of this kind

had ever been done before. But a test well is one thing, and a deep-sea production rig is another. Chevron will decide later this year whether to spend an estimated 10 billion dollars to bring in 6000 barrels per day from its amazing well, knowing one hurricane could wreck the whole investment.

As the years have passed, more of our oil trading partners have also reached the halfway point and gone into decline. Canada peaked in 1973, Iran in 1974, Russia in 1984, England in 1999, Mexico in 2002. Of the 65 largest oil producing countries in the world, 54 have passed their peak of production and are now in decline.

Back in 1974, M. King Hubbert predicted the world as a whole would reach peak oil production around the year 1995, give or take a few years. However, in the late 1970s and early 1980s, global oil consumption actually dropped, thanks to more efficient cars, conservation at home, and the shift to electricity and gas for heating. While new oil well discoveries peaked in 1965, and many individual countries peaked, the world as a whole did not peak. Until now.

Before now, the world has primarily relied on one country to hold up a weakening supply chain. That country is Saudi Arabia, and when the Saudis hit their halfway-point, the world will become a very different place. The Saudi's largest field is Ghawar. It is a mega-super field by any standard. When it was discovered in 1948 it was nearly twice as large, at 100 billion barrels, as the largest field ever discovered. Since then the total of all discoveries each year, in the entire world, have never been more than one-tenth that large. By 2004, Ghawar had produced about 79 billion barrels of light sweet crude. But now, for the past year, Ghawar has been having problems keeping up production.

Despite the best secondary recovery technology money can buy, despite historically high crude oil prices, and despite the need for the Saudi monarch to pay stipends of more than \$100,000 per year to more than 5,000 members of the royal family, Saudi Arabia has reached its peak in production and begun a decline.

There are not very many other places in the world that the USA and other oil-importing countries can look to for supplies, and none on the scale of a Saudi Arabia. We are about to enter a very different time.



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BSc and MSc degrees in Ecological Design and Community Development Studies from Gaia University

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Daddy, what's polysorbate 60?

by Albert Bates

If you look in your pocket, chances are very good there is something in there that is made from petroleum. Maybe it is a ball-point pen, or a plastic comb, or perhaps the credit cards in your wallet. When you go to the grocery store, you travel in a car that is made from many fossil fuel products and propelled by gasoline, you purchase foods that may even contain petroleum products (3 ingredients in Twinkies come from oil). In North America, the average salad travels 3000 miles. To grow those greens, farmers used tractor fuel, fertilizer and pesticides — all from fossil fuels.

So when Saudi Arabia oil production dropped by eight percent in 2006 (and would have fallen by fourteen percent if 32 new wells had not been brought on-line in record time), it is a big deal.

Saudi Arabia claims about 260 billion barrels of reserves, nearly a quarter of the world's total, so it is not surprising to see Saudi Arabia drill so many new holes. What is surprising is how hard it is getting to find. In January, 2005 there were twenty fresh explorations underway, a year later thirty-five, and in January 2007, fifty-five. Finally, in February, Saudi wildcatters finally found some new oil.

The Rub al-Khali ("Empty Quarter") gives new meaning to the word desert. In a place where sand dunes

are three-football fields high, temperatures run from below freezing at night to over 140°F at noon. This is one of the most inhospitable places in the world to drill wells and lay pipelines. It shows how far people will go to produce just a little more oil.

Back in 1974, Shell Oil geologist M. King Hubbert predicted the world as a whole would reach peak oil production around the year 1995, give or take a few years. While oil field discoveries peaked in 1965, and many individual countries peaked, the world as a whole did not peak. Until now.

Some years ago the US Department of Energy commissioned a study on what could be done to reduce the impacts that will come when world oil peaks and starts its decline. That study, released in 2005, said it was impossible to say exactly when the peak would come, but that how serious its effects would be would depend on how far in advance preparations were begun.

Bio-fuels, hybrid vehicles and electric vehicles, and plug-in hybrid electric vehicles can all reduce the need for oil, but it takes a long time to change our whole fleet to more efficient alternatives — several decades. Mass transit, van-pooling and carpooling, bus rapid transit, telecommuting and human powered transport all take time to make a significant dent.



Wind, solar, hydrogen, biomass, and tidal power may all have their place in the energy of the future, but they will do almost nothing to fix the liquid fuels shortage now looming as the Saudi desert grows drier.

Still, what we are about to experience is not something that humans have never been through before. We made a switch from whale oil to coal oil and kerosene only about 150 years ago. The industrial world made the shift from firewood to coal before that. The coming shift from our solar savings account — all that fossil energy stored up from millions of years of plant decay — to solar income — just what arrives from space daily — will probably be a good thing for pollution prevention, global climate, and nature in general.

There are a few small details that we need to be concerned with, however. In our haste to use up all the fossil fuel as quickly as we could find it, we put a tremendous amount of greenhouse gases into the atmosphere, and we now have to plant trees to save our climate from destruction. Those trees will compete for farmland with both food and fuel production.

The green revolution

brought about by cheap energy and chemical agriculture meant that we could double human population twice in the past century. We can't keep doubling, and we probably can't even stay at that higher population we've reached. Food in the future will have to be grown organically, locally, and without gasoline-powered tractors, for the most part.

Finally, peak oil will mean the end of limitless economic expansion, because that was based on spending down one-time fossil savings, not living on our solar income. Capital finance depends on expanding markets, profit margins, returns on investment, and the like. A steady-state economy is quite different from that. Inflation-free money systems are something we have almost no experience with, but will have to develop fairly quickly.

While these changes may not be welcome, and may be more rapid than most of us would like, they may still be a good thing. They will put us back in touch with our neighbors, with our communities, and with the natural world that is the source of all real wealth.

The Great Change by Albert Bates

In 2005 I was asking myself, Albert, what do you think they will call this point in time a century from now? And I said to myself, Self, I think they are going to call it The Great Change. Since then I have seen a number of books and websites that are putting their money on catch-phrases like the Great Turning, Petrocollapse, and Hubbert's Peak, but I'd still put my money on The Great Change. The Great Change will be wonderful. That is why they'll call it Great. With a capital "G."

Ever since we as humans switched from firewood to fossil fuel as our principal energy source, we have been gradually separating ourselves from our toes in the soil and the wind in our hair. The Great Change is when we re-connect. I've heard it said that when you are running full speed towards a cliff, it doesn't help to slow down, you actually have to stop and go the other way. That pretty much describes what is about to happen.

If it hadn't been the peak in oil production I have described in my two previous guest columns, it would have been something else that gave us the cliff. It might have been world food supply, or fresh water, or World War III. We live in a world of limits, and we have been listening to a kind of voodoo economics (in the words of a recent President) that says everything is unlimited – that demand somehow creates supply.

The amount of natural resources required to supply the lifestyle of an average family in the United States, if applied to everyone on Earth, would require a second planet. That has not been a problem until recently, because most of the families on Earth lived at standards of living far below ours.

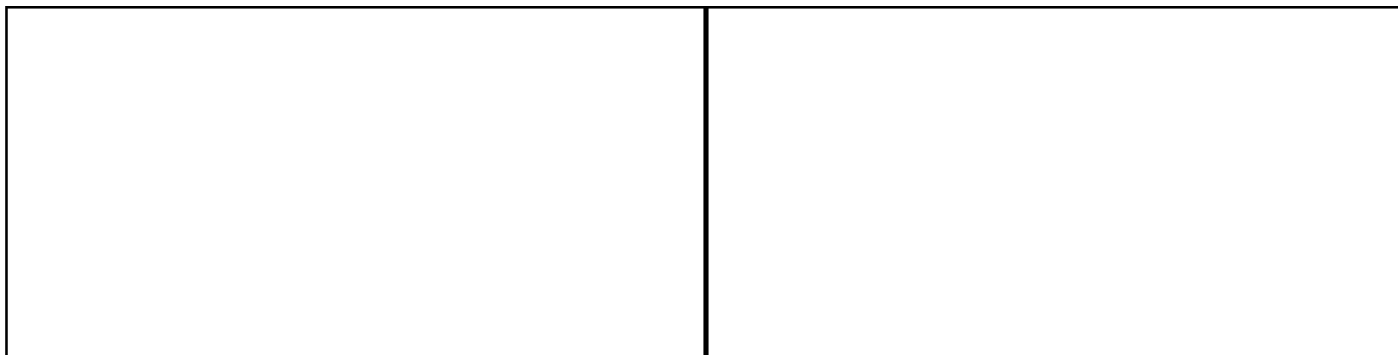
Then came Hollywood, and MTV which spoiled everything. Since the end of World War II more people have been born in just two countries, China and India, than were on Earth before then. Now China and India have MTV.

China's economy has grown by an extraordinary 9.5 percent per year over the past 20 years. In 2005, China consumed 26 percent of the world's crude steel, 32 percent of its rice, 37 percent of its cotton, and 47 percent of its cement. It could be the world's biggest manufacturer of cars by 2015.

If China has a weakness, it is energy. The industrial revolution that brought about the wealthy lifestyles of Europe, Japan and North America was fueled by cheap, abundant fossil fuels, which packed more energy per ounce than the peat, firewood and whale oil that came before. The problem — not just for China but for everyone else, too — is that oil is a limited commodity. As the wells go dry, whether it is next year or twenty years from now, we can't burn coal because of global warming, nuclear energy is a security nightmare, and solar — including wind, biofuels, tidal energy and hydrogen — packs a lot less energy per dollar spent. In some cases, corn-based ethanol for instance, it is even a net energy loss.

And that's a problem. So why is this such a good thing, you might be asking. And the answer is fairly simple. It is a good thing because we are going to stop racing towards the cliff. In coming years, as the price of gasoline shoots through the roof, and things that had traveled 12,000 miles to reach the store are simply not available any more, we will stop being so wasteful. People will learn to save rainwater, preserve vegetables for winter, and split firewood, like their grandparents did.

It will be better than it was for our grandparents, though, because we have acquired a few things in the past century that they didn't have. We can produce power for our homes from the sun, rain and wind, get around in pedal-assist hybrid vehicles, and choose from a dizzying array of seeds to plant in our organic gardens.



Disaster Relief: A “Green Perspective”

By Peter Schweitzer

From Plenty's experiences with disaster relief over three decades we have learned that so-called natural disasters are usually at least partly man-made. The first major disaster that Plenty International responded to was the earthquake that ravaged Guatemala in 1976. The massive quake, measuring 7.6 on the Richter scale, killed 23,000 people and left over a million homeless. The population that suffered the most loss of life and housing was the Indigenous and majority Mayan population. The Mayans were also the poorest people in Guatemala before the earthquake and their adobe

brick homes and heavy clay tile roofs were unforgiving death traps when the earthquake heaved the ground in four-foot waves at 4 AM as people were still sleeping inside. Equally hard hit were the poor living in shanties on the unstable walls of ravines in Guatemala's larger towns and cities.

When hurricane Mitch drenched Honduras and Nicaragua with 50 inches of rain late October-early November 1998, 11,000 people lost their lives due to flooding and mudslides. Most of these people lived in the shantytowns clustered in vulnerable low-

lying areas around industrial centers and agri-business plantations, areas made even more vulnerable by years of systematic deforestation.

When the badly constructed levees built to protect New Orleans collapsed in the aftermath of a greatly weakened Katrina, it was the poor in the Lower Ninth Ward who bore the brunt of the flooding.

Poverty is always one of the most important factors in how devastating a natural disaster turns out to be.

Another important factor is the systematic destruction of the natural barriers that might help to mitigate hurricanes and floods. This was especially evident with Katrina along the Gulf Coast where years of out-of-control development have eliminated the barrier islands and wetlands, which were the natural protections of the coast. Further exacerbating the vulnerability of New Orleans was the construction of an industrial waterway to be used by large ships, especially oil tankers, a waterway which during Katrina became a convenient channel accelerating water surges deep inland.

When we think about a green response to natural disasters, the best place to start is with prevention, which must include restoration of the natural world's storm mitigation systems and the elimination of poverty and the forced migration of the poorest populations to the most vulnerable habitats.

Low-Impact Building

By Howard Switzer

Low-impact, or natural building, is green building. By low-impact we mean low environmental impact using naturally non-toxic materials and minimizing the energy used in processing the materials coupled with design strategies to reduce the building's energy use. The people of Ghana have a practice called “sankofa” which means returning to the past in order to move forward. Low-impact building often relies on pre-industrial building methods, so in some ways is nothing new, but coupled with modern green technologies and passive solar design can produce an energy efficient green building.

For wall structures low impact buildings can utilize

the clay and sand mixture that makes up most subsoil, grass and other plant fibers for reinforcement and insulation and minimally processed wood, using round poles for structural elements where possible. Nearly 40% of the planet's population still lives in dwellings built of earth and straw, or other grasses such as bamboo. The earthen homes have stood the test of time and many thousands of them have been continuously inhabited for over 1000 years, an indication they are comfortable and easy to maintain as well as being very durable.

Sun dried earthen bricks, adobe, were used in the Pyramids of Egypt as well as the Pueblos in the west-

Then there are the completely “unnatural disasters” that again primarily impact the poor. Think Bhopal. Think meat packing plants and “cancer alley” around the Exxon-Mobile refinery in St. Bernard Parish next to New Orleans. Think 3,000 maquiladora plants along the Mexican border with the US employing a million Mexican workers most of whom live next to the toxic waste dumps created by these plants.

Extreme poverty condemns the poor to inadequate housing in vulnerable habitats, dangerous working conditions and toxic environments and is an on-going disaster that needs to be addressed continuously. The overdeveloped countries that contribute the most greenhouse gases to the atmosphere and are the most responsible for global warming are also most able to adapt to climate change, while underdeveloped nations who contribute little in the way of greenhouse gases, are more vulnerable and the least able to adapt. A “greener” world is a world that is not so divided into the few who have way too much and the multitudes who have disastrously too little.

ern US where approximately 200,000 modern homes are built this way. The Great Wall of China, like the Pyramids, is an earthen structure that was covered with stone. Many of those quaint thatched roof cottages in the British Isles are made of earth plastered white with lime. Green designers and builders are using these and similar techniques around the world to build modern homes that are beautiful, energy efficient, healthy and affordable.

Biofuels vs. Junk Food - Energy Independence vs. Chronic Fatness?

By Andrew Couch

More often than not, it is bad news that reaches people first. The news on Biodiesel and Ethanol is no exception. First we heard about the energy imbalance of Ethanol, and then it was the food vs. fuel issues with both Ethanol and Biodiesel, now there are reports that question the environmental benefits of these fuels. I will be the first to admit that Biofuels are not without their problems, but I am also quick to say that they are not as fatally flawed as their detractors would have you believe. The key to understanding the realities of Biofuels comes with an understanding of the role these domestically produced, cleaner burning and renewable fuels will play in our nation and our world. That role is clear; displace as much petroleum as possible, reduce air toxins and carbon emissions and increase opportunities for farmers.

Ethanol from corn has by-far received the worst press of all the renewables, particularly on the food vs. fuel issue. When we talk about the food supply being depleted or made too expensive by Ethanol, there are a couple of things that most people fail to take into consideration, namely unhealthy and nutritionally deficient snack food and high fructose corn syrup. These products not only hold no real value in the food pyramid, they are facilitating the fattening and slow death of entirely too many people. For that matter, one could also question the energy balance of a bag of Doritos or a can of Coca-Cola; this writer however will not be the one.

I do not want to suggest that corn-based ethanol is the answer to our petroleum crisis, it is not THE answer because there is no ONE answer. Ethanol from corn and Biodiesel from Soybeans are first generation, low hanging fruit biofuels that can greatly benefit the American farmer and help facilitate the development of a much healthier Bioeconomy. We must understand that it doesn't matter if you're an advocate of locally produced healthy food, biobased products, individual conservation and efficiency measures or the use of petroleum alternatives; we all have to play in

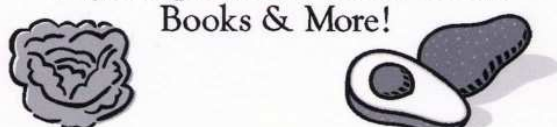


Andrew Couch speaking on biofuels at Step it up Nashville Rally

the same sand box if ever this world is to enjoy the prosperity to which it has become so accustomed.

Researchers and scientists all over the world are working on technologies that will ultimately make it possible to economically produce biofuels from products like switch-grass, municipal solid waste and algae. While producing energy products is a critical goal for all nations of the world, the need for a diverse number of chemicals, fibers, plastics and nutritional foods is of equal if not greater importance. Agriculture can provide all of this for all the creatures on planet Earth, the trick is in only producing the products that provide clear and healthful benefit to the Earth and its inhabitants and letting things like junk food phase out of our lives.

We know that for now ships and trains have to keep moving, planes must fly, trucks gotta keep hauling our junk and cars have got to lug us around; what doesn't have to happen is the voluntary dietary poisoning of ourselves and our children with these unhealthy and wasteful products that are clearly misusing our most precious resources. So the next time that you hear someone talk about the food vs. fuel issue, the question is this; what food are we talking about and what fuel got it there?

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Swan Conservation Trust

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Thousands Gather for Climate Action

Report by Jennifer D. English

April 14, 2007 was the National Day of Climate Change Action. More than 1400 gatherings were held nationwide with thousands of participants from all 50 states telling congress to "STEP IT UP!" The initiative is calling for congress to cut carbon 80% by 2050. That's a 3.7% reduction per year. Check out www.stepitup2007.org for pictures and reports from more than 1000 locations across the country!

STEP IT UP NASHVILLE held a Climate Action Rally, sponsored by Lewis County's Trees for Tennessee and the students and faculty of Vanderbilt Saturday, April 14th in Centennial Park, Nashville. Wild Oats was the primary corporate sponsor. Check out www.treesfortn.org for details. Aside from telling congress to step up emissions standards, the purpose of the rally was to offer working solutions for climate change.

Throughout the day speakers and bands took the stage telling Congress that we need climate action now. Supporters joined together to tell the world that the United States of America does care about this issue and that we're ready to go green. With a 100% chance of rain forecast throughout the day, more than 300 people came to sign the Step It Up petition, listen to speakers and to donate to the Trees for Climate Change Initiative, which raised \$600. Some even stayed through the rain to dance to music. More than 50 individuals donated time and resources to host the event and 12 businesses contributed items to the fundraising auction. Vendors braved the rain to give out information on carbon calculations, alternative energy, biofuels, green products and more.

The keynote speaker Albert Bates, internationally recognized author of *Climate in Crisis* and *The Post-Petroleum Survival Guide and Cookbook* spoke on climate change solutions such as planting trees and bamboo, using appropriate technology and cutting lifestyle pollution. Other speakers included Douglas Stevenson from the Swan Trust, Jeff Belli from Trees For Tennessee, Andrew Couch and Dave Pelton from Clean Cities of Tennessee and Jacob Gordon from the Climate Project. International Jazz artist Suzahn Fiering both performed and served as Master of Ceremonies; Vanderbilt band 'The Bluff'; The Watermelons Groove Band; The Bollans and Ed Haggard and The Love Drums all performed on an open band stage despite the inclement weather.



People gather at Step it up Nashville



Jeff Belli gives away trees as a volunteer for Trees for Tennessee

Climate Action Now: We CAN Do This!

By Jennifer D. English

Climate Overview

The United Nations Intergovernmental Panel on Climate Change, employing 2500 world renowned scientists in a six year effort, has been releasing its working group findings in a series of reports this year. The first was released in Paris in February and said there is now no doubt that human activity is causing the Earth's climate to change at a rate that is unprecedented in natural history. The second report was released in April in Brussels and said that heat waves, crop failure, and weather events could reduce world population by one-third this century. The third report, due out in May, is expected to affirm that even if severe restrictions on greenhouse gas emissions were taken now, there is a possibility it would do no good; it is simply too late.

In 1988, leading atmospheric scientists predicted that we had less than a decade to prevent sending our planet into extreme weather and possibly risking mass extinctions of life on Earth. While nations around the world reacted quickly, formed treaties such as the Kyoto Protocol and passed laws to restrict greenhouse emissions, the United States, Australia, Saudi Arabia and others ignored their warnings. The result is now written in rising sea levels, more intense hurricanes, and summer heat waves that kill thousands, even in Europe.

Still, there may be opportunities to limit the damage from global warming and possibly save us a worse fate than is otherwise in store. Removing greenhouse gases from the atmosphere and not adding further to the global burden is only the start of the process. We will need to depend more in the future on solar energy in all its forms and less on-buried hydrocarbons like oil, gas and coal. We need to plant trees and other fast growing crops that serve as atmospheric scrub-brushes.

Global Change and Solutions:

In the United States both Democrats and Republicans have finally begun to recognize the need for immediate action. Conoco-Phillips, British Petroleum, General Electric and others have begun to make pledges towards cutting carbon and producing more appropriate technologies.

The biggest change is among the citizens of the United States as hundreds of thousands of people are not only letting Congress hear their concern about global warming through petitions and rallies, they are also starting to educate themselves on reducing lifestyle pollution. Arnold Toynbee in his Study of History states, "True growth is the ability of a society to transfer increasing amounts of energy and attention from the material side of life to the nonmaterial side and thereby to advance its culture, capacity for compassion, sense of

community and strength of democracy."

There are five important actions each of us can do to lessen the impact of climate change. The time to act is now.

1. Let congress and big business know that you care about reducing carbon
2. Sequester carbon by planting trees and protecting forests from being cut
3. Switch to alternative and appropriate technology
4. Conserve energy
5. Simplify your lifestyle

People do not need to fear downsizing. Richard Gregg, the first person to use the word voluntary simplicity states, "Simplicity is a relative matter depending on climate, customs, culture, and characteristics of the individual."

Simplicity is about putting out the least amount of effort for the most happiness.

Here are 108 actions you can take to simplify your life, conserve energy and save not only money but also the entire earth.

1. Turn the lights off when you're not in a room
2. Unplug appliances, especially those with indicator lights or DC adaptors, when not in use
3. Switch your incandescent light bulbs to compact fluorescent
4. Buy Energy Star® appliances
5. Cut down the use of electric gadgets when non-electrics are available
6. Turn off your computer or put it in sleep mode when you're not using it
7. Make sure your place of work also turns off the computers, lights and display lighting after hours
8. Use rechargeable batteries
9. Use non-electric phones
10. Don't stand at the refrigerator with the door open and don't put hot items in the refrigerator or freezer. Let them cool to room temperature first
11. Place refrigerators and freezers

in cool shaded areas of the home

12. Soak and pressure cook beans and grains to cut down on cook time, especially if you have an electric cook stove

13. Watch less TV, play less video games, surf the internet less – go do stuff outside, get creative – read a book, be an artist, have a picnic . . .

14. Get a free home energy audit

15. Install triple-paned windows and use weather-stripping and caulk

16. Make sure your house is well insulated and when insulating choose green insulation such as cellulose, cotton, recycled denim, soybean or straw

17. Build your home naturally and use passive solar heating and cooling, as well as natural lighting

18. Plant trees on the Southeast and Southwest corners of your home to add shade during the summer and reduce wind-chill in the winter

19. Don't stand with the door open in winter. Consider building closed-in entry rooms/foyers that trap heat and cold between two doors instead of letting it into the house

20. Use arbors and trellises to shade your home in the summer to cut back the need for air conditioning

21. In the summer open windows at night and close all windows on the southern side of the house during the day. Use fans to draw cool air from the shaded side of the house and pull the air through the house with other fans strategically placed to transfer air out of the house

22. If you must use air-conditioning turn it off when you're not at home, and set it to 74 degrees

23. Make sure that the air conditioner is off during the night at your place of work and tell management to keep the air conditioner off when you are gone from your hotel room

24. Ask your employers to keep the office around 70 degrees in the summer and 68 or lower in the winter. Ask them if you can dress according to those temperatures.

Wear less ties and coats in the summer and more in the winter

25. Use solar, wood, pellet, or biomass heaters and cook stoves if possible

26. Wear more layers in the winter so you can stay warm

27. Place thermal mass around your wood stove to retain heat

28. Have wood stoves in the center of the house instead of outdoor chimneys

29. Consider placing radiant heat under your floor

30. Paint your walls with appropriate color according to whether you want more heat or cooling in the room

31. Have thermal mass or water features in your house or greenhouse to absorb heat and coolth
32. Don't waste water
33. Brush your teeth with the water off
34. Don't take excessively long showers
35. Try not to shower more than once a day
36. Wrap your batch hot water heater or install on-demand water heaters
37. Install a solar and/or wood fired hot water heater
38. Install solar panels, wind generator, and geothermal or hydro electric features on your home
39. Buy or sell green energy credits from or to your electric cooperative
40. Catch rainwater in barrels or cisterns
41. Use rainwater for outdoor landscaping, gardening or to flush toilets or wash clothes
42. Use cold water to wash clothes
43. Dry clothes on a line or an indoor rack
44. Install greywater features to filter water from your sinks, showers, and laundry
45. Use only biodegradable non-toxic and non-bleach products in your sinks, showers and laundry
46. Try to wash dishes by hand
47. If you do prefer to use a dishwasher then be sure to let the dishes dry naturally or dry them by hand
48. Consider building worm boxes for water filtration
49. Purchase or build composting toilets
50. Compost all kitchen and yard waste for your garden or for local farmers
51. Recycle paper, plastic, cardboard, metal, etc...
52. Print on both sides of paper
53. Keep one-sided scrap paper for quick informal printing
54. Print with low quality unless formal setting needed
55. Use recycled paper at home and at work
56. Print less, especially in color
57. Recycle your print cartridges
58. Get taken off junk mail and consider getting fewer glossy subscriptions
59. Use recycled, natural or salvaged materials in building your home, office or when landscaping
60. Buy products produced and distributed locally, within 90 miles
61. Support your local farmers and artisans
62. Buy products that have less packaging
63. Buy products that are green, appropriate and made of non-toxic materials
64. Support businesses that take ecological and social costs into account when pricing their products and services
65. Support businesses that support the environment, purchase green energy, limit their pollution or incorporate their residual waste into production
66. Support businesses that participate in pollution credits or pollution tax programs
67. Avoid products made out of petroleum and metal
68. If you want petroleum-based or metal products buy them second-hand
69. Say no to plastic shopping bags – use cloth bags or boxes
70. Shop at businesses that carry local products
71. Buy items that are practical not just decorative
72. Buy organic food
73. Learn to garden and build an artsy greenhouse or cold frames with salvaged windows
74. Avoid chemical fertilizers and pesticides
75. Plant trees
76. Support farmers who practice sustainable agriculture
77. Buy herbs and supplements over pharmaceuticals if possible
78. Eat less meat. 1 hamburger = 2 pounds of carbon in the atmosphere
79. If you do need to eat meat make sure it's free range, organic and local
80. Say no to getting food from 1000 miles away
81. Say no to mass production – say yes to quality over quantity
82. Eat local foods in season
83. Don't use throw away products – buy items intended to last
84. Try to avoid paper or plastic dishes at parties, unless you plan to reuse or recycle them
85. When throwing a party think green, simple elegance, less is more
86. When gift giving or receiving ask for less and go with hand made, natural or second-hand items
87. Be creative with reusing wrapping paper, brown paper bags or newspaper/magazines. They can be beautiful!
88. Ask for secondhand clothes – vintage is cool
89. If you want pets – adopt
90. Feed your pets natural food
91. If you have livestock don't overgraze them – keep the numbers relative to the land
92. Don't buy pets or tropical plants taken from outside of this country
93. Buy a hybrid car
94. Buy a diesel car and run it on biodiesel or convert it to run on straight vegetable oil or better yet – filtered waste vegetable oil
95. Tell automakers that you want a flex-fuel (ethanol or biodiesel) hybrid plug-in electric – that you can plug in at home and recharge with solar panels and green power credits
96. Car pool and use mass transit and public transportation whenever possible
97. Let your state know that you want more trains, buses and bike/pedestrian paths
98. Travel less – bike and walk more
99. Work closer to home or work at home
100. When you do travel go on airlines that are conscious about energy conservation, that have direct routes and that recycle
101. Keep your tires inflated properly
102. Use the air conditioner in your automobile less
103. Encourage your community to be more pedestrian friendly – more like a small village where you can walk to the bakers, the grocery store, and the café
104. Encourage local small business development
105. Encourage local cooperative development, especially small green energy cooperatives or any cooperative that meets peoples basic needs for food, water, power, healthcare, etc... locally
106. Opt to buy into community owned goods such as tractors, mowers, larger power tools, etc... items that one person may use infrequently
107. Calculate your carbon footprint and offset your emissions by donating to organizations who either plant trees, protect the environment or develop appropriate technologies
108. Be grateful and content with what you have, be happy, feel true wealth, cultivate compassion and love



We CAN!!!

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Contributing Writers



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CHE and Sonnenschein want to thank you for your contribution!

2007 Courses at the Ecovillage Training Center

- June 7-10 Herbology
- June 8-10 Natural Building
- June 15-24 Permaculture
- July 13-22 Ecovillage Design
- July 13- Aug 12 Apprenticeship
- July 27-29 Natural Building
- July 29-31 Volunteer Days
- Aug 10-12 Biofuels Conversion
- Aug 10-17 Advance Permaculture
- Sept 1-18 Permaculture
- Oct 11-14 Solar Course
- Oct 16-19 Alternative Energy
- Oct 19-21 Biofuels
- Oct 12-21 Advanced Permaculture
- Oct 14-Nov 9 Apprenticeship
- Nov 2-4 Permaculture Intro
- Nov 3 Shitake Mushroom Growing

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Please contact ecovillage@thefarm.org if you'd like to submit an article for the next edition.

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“The cultivation and expansion of needs is the antithesis of wisdom. It is also the antithesis of freedom and peace. Every increase of needs tends to increase one’s dependence on outside forces over which one can not control, and therefore increases existential fear.”

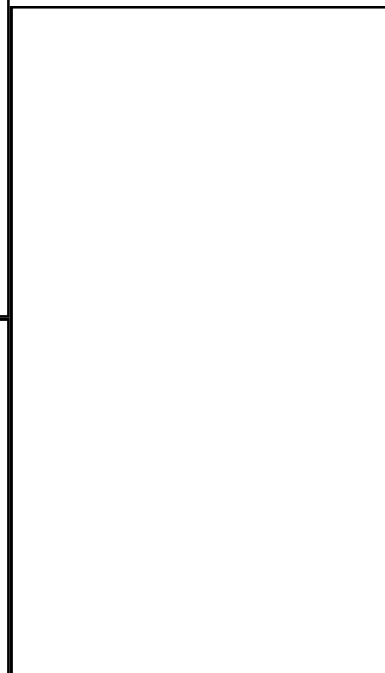


Calendar of Free Events in Middle TN

- August 3-5 Green Business Course at the Ecovillage Training Center
- August 20-25 South Central Area Fair
- September 8 LACC Health Fair
- September 21-23 Bioregional Gathering at Earth Advocates Research Farm
- October 12-14 Oktoberfest at Meredith Lewis State Park
- October 11-14 Hwy 20 Yard Sales
- October 16-17 Middle Tennessee Tour of Alternative Homes with the American Solar Energy Society
- November 3 Shitake Mushroom Growing Basics at the Ecovillage Training Center
- December 1 Holiday Bazaar at the Farm Community Center

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Local
Economic
Development
and
Green
Education

Middle Tennessee Green Pages to debut in 2008

The Green Pages of Middle Tennessee is a Directory of ecologically and socially conscious businesses in our bioregion. The directory will eventually be available in paper format and online. The Directory is part of the Middle Tennessee Local Economic Development and Green Education Initiative led by the Center for a Holistic Ecology and the Global Village Institute. The Directory is now in preliminary development and with

the intention to have the first edition ready in 2008. Businesses can be listed for free or purchase advertisements in the Directory. The aim is to network green businesses in the bioregion and to increase the public's awareness of our green Tennessee! The directory will be linked to this Journal. Individuals and businesses can subscribe to the Journal and Directory for a minimal fee to cover printing and mailing.

To order a subscription or to take out an ad in either the Green Living Journal or the Green Pages Directory e-mail Jennifer D. English at ecovillage@thefarm.org.

Sonnenschein's Green Power Schedule for June 2, 2007 in Hohenwald, TN

Venue: High Forest Room, Memorial Park

10:10 Welcoming Address

Mayors of Lewis County and the City of Hohenwald

10:20 Green Power: Solutions for a Wealthier Future

Jennifer D. English, Chairperson Green Power Committee

11:00 Climate Change: Why Now is the Time to Act

Representative from the Climate Project

11:40 Deforestation and Loss of Biodiversity

Representatives from Swan Trust, and Earth Advocates Research Farm

1:00 The Energy Crisis: What We Can Do

Representatives from MLEC, TVA, and Southern Alliance for Clean Energy

2:20 Current Fuel Technology

Representatives from Clean Cities of Middle and West TN, and Middle TN Biofuels Project

3:40 Generating Home Power

Representatives from Big Frog Mountain

4:20 Cycling Energy in the Home System

Representatives from the Ecovillage Training Center, and Ecoville Architects

Tent 1 – Skills for Self-Reliance

11:20 Natural Building and Green Power

12:00 Low-Impact Building

12:40 Solar Hot Water Heating

1:20 Going for Geothermal

2:00 Disaster Preparedness Strategies

2:40 Green Power Tax Incentives

3:20 Renewable Energy Grants

4:00 Practical Home Applications

Tent 2 – Food and Energy

11:40 Running on Vegetable Oil

12:20 Strategies for Surviving Peak Oil

1:00 Green Power to Grow On

1:40 The Benefits of Bamboo

2:20 Backyard Permaculture

3:00 Going Local and Staying Green

3:40 Urban Agriculture

4:20 Developments in Green Power

Green Power Music Stage

12:00-1:00 Southern Exposure

1:15-1:45 David Parr and Chapman Stick

2:00-2:30 Huntley Sisters

2:45-3:15 Spurlock Family

3:30-4:00 Howard Switzer and Katey Culver

4:15-4:45 Kenny Durham & the Cheyenne Medicine Show

5:00-6:00 Southern Exposure

With MC Joel Goldstein and guests!!!

Green Power Film Fest

12:00 Kilowatt Ours

12:45 Who Killed the Electric Car

2:20 The Power of Community:
How Cuba Survived Peak Oil

3:30 An Inconvenient Truth

Alternative Vehicle & Fuel Expo

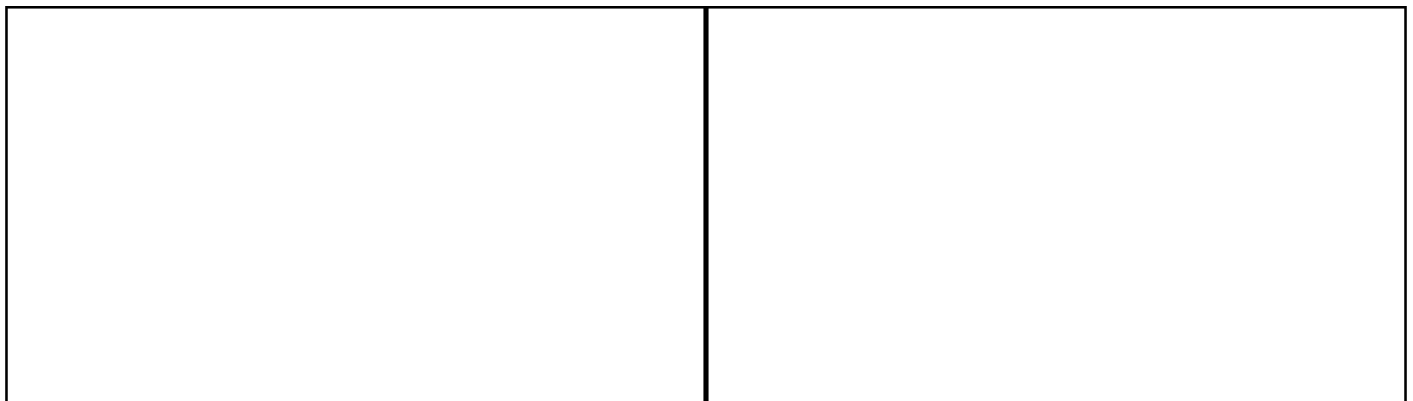
Veg. Oil, Biodiesel, Ethanol & more 10-5 pm

Kid Power - Energy Play Shop

Games, Prizes and Fun!!! 12-3 pm

Green Power Exhibition Hall 10-5 pm

*Be sure to check out the Tour of Alternative Homes to be held Sunday June 3, 2007! You can register at the Sonnenschein information booths June 2 or by contacting ecovillage@thefarm.org
There will also be tours October 16-17, 2007!*



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Find out more about the Sonnenschein Festival 2007! Read page 19 for a schedule of events and details about this fantastic new annual event in Middle TN! The Green Living Journal committee wants to thank the Sonnenschein Festival volunteers, the City of Hohenwald, Lewis County, and contributing businesses for making this Journal possible! Keep your eyes on Sonnenschein in the first weekend of June 2008! Year three will be even better!

THINK GREEN!!!



Preserving life should be the natural result of commerce, not the exception.

Paul Hawkin in
The Ecology of Commerce

Weaving Roots Debut, continued from page 1

Global Village Institute for Appropriate Technology, GVI another 501c3 organization that has been active in Summertown since 1974. GVI, a partner in Middle Tennessee's LEDGE Initiative is a co-sponsor of Weaving Roots. GVI is a non-profit organization created to research promising new technologies that can benefit humanity in environmentally friendly ways. Throughout its history, GVI has served as a living laboratory for developing, incubating, and showcasing appropriate technologies. GVI and CHE developed the LEDGE initiative in spring 2007, to foster a network of resourceful entrepreneurial leaders, researchers and educators who live, cultivate and teach sustainability in their communities and develop ecologically and socially responsible enterprises in Middle Tennessee.

To find out more about CHE and GVI's other projects visit www.i4at.org, www.thefarm.org/etc and www.treesfortn.org, e-mail ecovillage@thefarm.org or call 931-964-4474.

Please note that the articles in this journal first appeared in the Lewis County Herald's Sonnenschein Green Power Column and are used here courtesy of the Herald.