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G.E.T. IT!

green energy times

YES YOU CAN! ... BE ENERGY INDEPENDENT!
and the time is now!! read on...

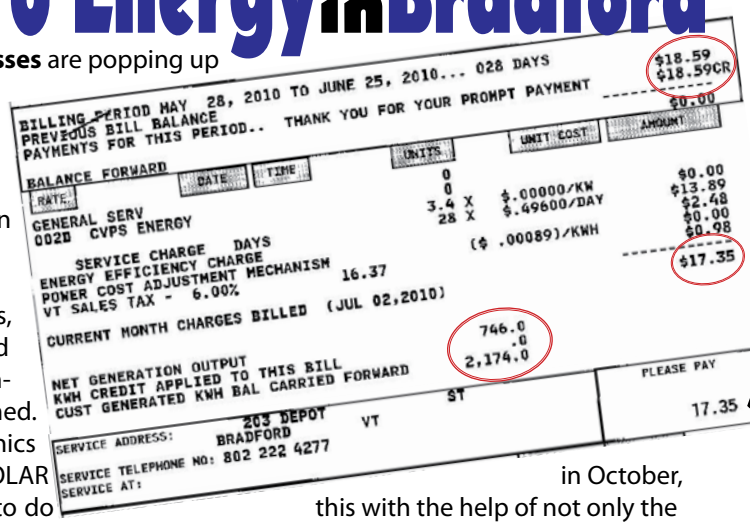
SOLAR POWER
WORKS ...ANYWHERE
UNDER THE SUN!

HOW sustainable is your BUSINESS

pg 18-23 >>

North Country Organics Net-Zero Energy in Bradford

Sustainable Businesses are popping up everywhere. We recently discovered a roof covered with Solar Panels, locally and had to have the story. Green Energy Times met with Paul Sachs, owner of North Country Organics, and we are very pleased to share with you the information that we learned.


BILLING PERIOD MAY 28, 2010 TO JUNE 25, 2010... 028 DAYS
PREVIOUS BILL BALANCE $18.59
PAYMENTS FOR THIS PERIOD.. THANK YOU FOR YOUR PROMPT PAYMENT $18.59CR
BALANCE FORWARD $0.00
RATE | DATE | TIME | UNITS | UNIT COST | AMOUNT
GENERAL SERV 0
002D CVPS ENERGY 0 $0.00
SERVICE CHARGE DAYS 3.4 X $.00000/KW $13.89
ENERGY EFFICIENCY CHARGE 28 X $.49600/DAY $2.48
POWER COST ADJUSTMENT MECHANISM $0.00
VT SALES TAX - 6.00% 16.37 ($ .00089)/KWH $0.98
CURRENT MONTH CHARGES BILLED (JUL 02,2010) $17.35
NET GENERATION OUTPUT 746.0
KWH CREDIT APPLIED TO THIS BILL .0
CUST GENERATED KWH BAL CARRIED FORWARD 2,174.0
SERVICE ADDRESS: 263 DEPOT ST BRADFORD VT
SERVICE TELEPHONE NO: 802 222 4277
SERVICE AT:
PLEASE PAY 17.35

North Country Organics of Bradford, VT went SOLAR in October, 2009. They were able to do this with the help of not only the 30% Federal Incentives, but also with a Rural Development Grant ( ), that saved them an additional 25%, along with a few other credits that they were able to take advantage of. The bottom line is that they were able to GO SOLAR for 29% of the cost of the system! The anticipated payback period will be 8-10 yrs. *In effect, they simply did a Pre-Buy on their electric - as many do with their fuel bills. This is better, however, because at the end of this time period, they will never have to pay for electricity again!*

So, here it is heading towards a year since they were up and running. G.E.T. asked Mr Sachs how it was all working and how much of their electric needs that the system was taking care of? The system was designed, along with their data from their normal usage, to meet 100% of their needs. A 9600 Watt system accomplishes this by building credits with CVPS in the sunniest months and using that credit for the off-periods.

Is it working? *At the time of our meeting in July, they had over 7,ooo kWh credits, before the end of July!*

Here are their accumulating monthly Solar Meter Readings:

>> Cont'd on p. 26>

11.30.'09	12.31.'09	1.31.'09	2.28.'10	3.31.10	4.30.'10	5.31.'10	6.30.'10
608	749	896	1467	2382	3516	4954	6059

National Life's Environmental Initiatives Came One Step at a Time

By Chris Graff, vice president, National Life Group

People ask how National Life Group transformed its 50-year-old Montpelier headquarters into a green campus. The reply is simple: Slowly.

National Life's Montpelier, Vt., headquarters – at 500,000 square feet – is one of the largest commercial office buildings in the state. More than 1,000 employees work on the campus.

At the beginning there was no grand plan, just a goal of improving energy efficiency. Clear glass windows in the huge building were replaced with thicker, tinted glass to reduce the solar load on the building and make it more economical to cool in the summer. A white membrane roof was installed with new insulation.

Shredded paper is used as bedding at a local dairy farm for 700 milking cows

The initiatives broadened to include more than energy efficiency: Recycling initiatives were implemented; cafeteria waste was composted and waste cooking oil sent to biodiesel. Shredded paper was trucked to a local dairy farm to use as bedding for 700 milking cows. We now recycle more than 73 percent of our waste.

And then the planning became much more deliberate and integrated.

In 2007 National Life transformed the offices of its Human Resources department into a showcase for leading edge green technology. The project added carpet with no volatile organic compounds (VOC), occupancy sensors, glass walls and automatic blinds that allow light to penetrate, while keeping the heat out in the summer and the cold out in the winter. The idea was to try out every technology and see what was most successful and could be installed in the rest of the building.

In 2008 we updated 6,026 light fixtures to High Performance T8 lighting systems and we replaced all of the aging water fixtures with low-flow fixtures, cutting

>> Cont'd on p. 20 >

Sun, Baby, Sun!

The topic of how we get our energy is on the forefront of conversations these days as we grapple with the oil-spill disaster in the Gulf of Mexico & the recent coal-mine collapse in W.VA, not to mention the dozens of aging nuclear power plants around the country.

Whether or not you're in favor of deepwater drilling, nuclear power or mountain-top removal, the truth is that we all do have choices in how we get our energy. & those choices do impact our economy, our health, & our environment. Despite the flaws in our government energy policies, as consumers, our choices matter, especially when consumers can become independent power producers through technologies like solar power installed on their rooftops. Yes VT needs a feed-in-tariff like Ontario, Germany, Denmark, Italy, etc. Yes VT needs to stand up to federal actions that undermine our efforts at energy

>>Cont'd on p.26>>

Driven By Solar

***Battery Powered** Riding **Lawnmower** - No gas, No Oil, No emissions! G.E.T. is trying it out!*

As the summer chores of mowing the lawn grow weary & dreams of permaculture grow, too, we discover a new 'guy' (i mean 'mower') in town, to help mow the lawn while still caring for the planet! A new Canadian company, 'Driven By Solar, Inc. is revolutionizing the way of the future for a truly green lawn! Powered by solar,

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GREEN ENERGY TIMES (G.E.T.)

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ABOUT G.E.T.

The Green Energy Times is powered by 100% solar, off-grid with a 3.8 kW PV system. Energy Independence is possible with clean, renewable energy. ***Our mission is to motivate people to move on into an educated, Renewable Energy lifestyle, to reduce their carbon footprint. YOU CAN become energy independent now! Believe in our future! Believe in this earth! Solar works! … anywhere! under the sun!***

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We want to hear what you are doing to make a difference! Together we can make a wonderful world. **Peace!** ♻

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Letter to the Editor

Greetings:

What a climax to the Vermont tourism network (Fam. Tour 2010) lodging at the Capitol Plaza Hotel. Located in its lobby were copies of Green Energy Times which I electro magnetically was drawn to. It's contents and substance of primary usefulness of alternative energy sources and professional providers are par excellence. Wholistic energy vibrations in harmony with nature are planet earth's solutions to major reduction to fossil fuels and nuclear power plant's suppliers of the ever ending increase of human population, Global Energy Consumption needs. Control of the natural resources/ minerals seemingly yield perpetual wars over the supply/demand equations regarding those same resources/ minerals, locally/globally. The choices of changing our energy requirements is a personal responsibility of each citizen of planet earth. Excuses for misuse and abuse of availability of today's natural resources are to be gracefully passed onto tomorrow's generations. Our Estate Plan's Trust's-Foundation's legacy Tax free-Guilt free- Fresh Air free-Sunfully free- For all to see and experience via Passionate, Peace, Love, and Acute Blissfulness in Mother Universe of awareness Souls in Divinity. A glow in Spiritual flow. All the more we seek to know and share, as we grow in oneness.

Health & Ecology, be yours

Ricardo Battle • 07-22-10 • Doors To Shores Travel, Inc •

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solar power works! …anywhere under the sun

Green Energy Times** would like to know any subject YOU would like us to cover, or cover better, so that we can help you make educated decisions about Renewable Energy & how to reduce our dependence on Fossil Fuels. **We also need to figure out how to repair the damages we have done to our atmosphere ASAP!

Next Issue of G.E.T. is Nov. 5, 2010. Special Feature: "How Sustainable Is YOUR Home?" If you have a story or information you would like to share, please let us know!

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SOLAR Q&A

Solar Uncertainty

by Howie Michaelson of Sun Catcher

This is the second edition of Solar Uncertainty. We hope you find the topics covered useful and interesting. If you have solar questions you'd like answered, please submit them to: HYPERLINK "mailto:questions@suncatchervt.com"questions@suncatchervt.com for inclusion in future editions!

1. CAN I USE SOLAR PANELS TO HEAT MY HOME?

This question comes up more and more. The simple answer is yes. The more complicated answer is, in our climate it is doable, but does not likely make sense, at least from a financial perspective. This is primarily because the times that we need space heating the most are the times we see the sun the least. To take advantage of the sun for space heating in Northern New England, large amounts of collectors, even larger storage tanks, and a host of additional controls and pumps are necessary, all of which add dramatically to the cost of solar thermal systems.

However, if fuel prices go up significantly (not an unlikely prospect), these added costs may well be worth considering. In the mean time, Solar Thermal systems for heating domestic hot water systems currently makes plenty of sense both environmentally and financially.

2. WHAT IS SPECIFIC GRAVITY OF A BATTERY AND WHAT DOES IT MEAN?

Specific Gravity (SG) is a measurement of the mass (weight) of something in comparison to that of water, which has an SG of 1.0 . Generally, if an object sinks in water, then it is heavier than water and has an SG of greater than one. If something floats in water, then it has an SG of less than one.

When referring to batteries, measuring the SG is usually the most accurate, practical method for determining their condition and/or their State of Charge (SOC). It is measured by using either a hydrometer or a refractometer to test the acid of each cell in the battery bank in lead-acid batteries (we cannot measure the SG of sealed - no maintenance - batteries). The greater the SG, the stronger the acid, and therefore the higher the SOC. Typically, deep-cycle lead acid batteries (the type often used in off-grid systems) are considered full when the SG is between 1.265 and 1.275. Anything 1.050 or below would be a "dead" cell, and not likely recoverable, although I've seen it happen.

Taking regular SG readings of batteries can be key to maintaining their long-term health, as well as early detection of developing problems. While I recommend learning how to measure SG, particularly to folks living off-grid, it is important to note that understanding the subtleties of SG is as much an art as a science, which takes time to learn. It is also critical to note that lead-acid batteries should be approached with great caution due to the amount of energy they contain as well as the fact that they are filled with an acid that will not only sting your cuts and eat holes in your clothes but pose a significant eye hazard. Always use appropriate safety and protective gear whenever dealing with lead-acid batteries.

3. WHY DO BATTERIES SEEM TO WORK WORSE DURING THE WINTER?

Lead-acid batteries, as well as most batteries in off-grid power systems, need regular charging to keep in good health and operation. In most off-grid systems, battery charging happens through a combination of a renewable energy source (solar, wind, and/or hydro) and a gas, propane, or diesel generator. Most folks don't like running their generator anymore than they absolutely need to for financial and environmental reasons. Unfortunately, because our solar resource is quite limited during late fall and early winter, and general reluctance to using fossil fuels to make up the difference, these systems are often chronically undercharged, often permanently damaging and diminishing the battery's capacity.

During the summer months, when we have ample solar resource, the batteries (even if damaged) can maintain an adequate performance for the short summer nights. On the other hand, during our solar starved winter months, if the generator is not run enough, the batteries stay in a low SOC, which greatly limits their output and exacerbates any problems lurking just below the surface.

***IN FUTURE ISSUES OF G.E.T.:** Lights- fluorescents, LED's • Batteries-Off-Grid and On-Grid Questions & maintenance • If Solar Hot Water doesn't work as well in the winter, is it the same for Solar Electric (PV)in the winter ?* ♻

Cyan Magenta Yellow Black

The Transition Town Model- Foraging & Reskilling

by Annie McCleary

Peak oil and the reality of global warming require that we once again find our food locally – wild food as well as cultivated. We can no longer rely on long distance transportation to supply our daily food needs, or any other needs for that matter. The end of the age of cheap oil, and the resulting globalization that led us to become an import-dependent society, are giving way to the age of relocalization, when we will once again be responsible for cultivating and wild foraging our food staples locally.

In a short-term survival situation, ie: If lost in the woods, finding food is fourth on the priority list after shelter, fire and water. In a long-term survival situation, however, food is everything. In Vermont, we currently import about 90 - 95% of our food, a shocking figure for a rural state with what seems like a great many farms and avid home gardeners. Vermont is at the end of the current fossil fuel driven supply line. Grocery stores hold only 72 hours worth of food. We have a short growing season and a severe winter to survive.

The Transition Town Initiative offers a positive model for empowering grassroots communities to creatively and proactively face the unprecedented challenges of our times - peak oil, climate change and economic instability. In The Transition Town Handbook: From Oil Dependency to Local Resilience, Rob Hopkins describes building futures based not on cheap oil, but based on relocalized food production, local economies and an enlivened sense of community well-being.

A core aspect of the Transition Town process is the "Great Reskilling", re-learning the skills that our grandparents took for granted, such as how to use hand tools, build our own structures, mend and make clothing, make our own medicine, forage, grow, preserve and store our food. Now is a good time to learn them and start the long process of re-creating resilient communities.

Reskilling around our food needs includes dramatically increasing local cultivation, seed saving, wild harvesting, hunting and fishing, and planting perennial edibles, such as fruit and nut trees and Jerusalem artichokes. Relocalization of our food needs in this part of the world requires putting food by for winter and storing root crops in the natural cold storage of root cellars.

Knowing the local wild edibles must once again become basic knowledge, even a survival skill, for everyone. Integrating wild foods into our daily diets requires that we educate ourselves and our communities in the art of safe and sustainable foraging… ***more next issue!***

Annie McCleary, M.A., is the director of Wisdom of the Herbs School in Woodbury, Vermont, She is a member of Steering Committee of Transition Town Montpelier. 802-456-8122 transitiontownmontpelier@gmail.com www.WisdomOfTheHerbsSchool.com

Waste Reduction Efforts at the Prouty

How to Manage Waste Responsibly at a Big Event

by Roger Lohr

Think about the waste that accumulated at the Prouty Bike Ride & Challenge Walk. The Hanover, NH fund raiser held on July 9-10 drew about 4,500 participants, who rode a bike or walked for pledges to the Norris Cotton Cancer Center and ended up at the Richmond School to devour a variety of free food offered by event sponsors. This year more than $2.2 million was raised to help research at the center and the tons of waste discarded at the event was mostly (about 92 percent) recycled or composted.

To design and execute the refuse effort the Prouty recruited Eva Christensen, owner of Earthtenders from Farmington, NH, (an organics recycling facility and education center dedicated to economical and environmentally acceptable solutions to waste reduction and natural resource conservation) for an in-kind sponsorship donation to organize and implement services for this effort. The program goals include diverting trash from the landfill (and costs associated with dumping), decreasing methane gas to fight global warming, and educating the participants about the refuse.

The Prouty staff assisted by ordering compostable items (as advised by Earthtenders) and by gathering the number of "Green Team" volunteers needed. The Northeast Waste Company supplied all the bins and dumpsters, picked up refuse from the bike ride rest sites, and it also retrieved, transported, and disposed of the waste items after the event. Dartmouth agreed to compost the materials.

The success of such a program is in the details and having dedicated and extraordinary volunteers. At the Prouty, despite persistent rain throughout the early morning every "Green Team" volunteer stood at the garbage bins, declining umbrellas while maintaining their smiles and helpful attitudes until the conclusion of their shifts. At day's end, a large group of volunteers stayed late to make sure the last minute waste was properly sorted.

All waste items generated were first sorted upon receipt at bins that were staffed to help Prouty participants place their trash in the proper barrels for recyclables (plastic bottles, cardboard, and cans), compostables (food scraps, paper plates and cups), and trash (types of product wrappers). This is the key element of the program success. It has been documented that unmanned trash collection bins are very problematic presenting a harder, dirtier, and more time consuming process. Most people do not heed the instructions without personal attention. The volunteers got their hands dirty and also educated the public about seeing the trash as a resource and separating it accordingly.

The bins were periodically emptied and brought to a tent at the back of the event where volunteers were assigned to empty all bags and check for contaminants in the compost. All materials are very carefully screened and after the final screening the respective bags of recyclables and compostables were placed in large metal containers. The final tally was estimated at about 18 cubic yards of compostables, 15 cubic yards of recyclables, and 3-4 cubic yards of trash. If all of the refuse was laid out, the items to be discarded would represent about only 8 percent.

The design and execution of the Prouty refuse management program was estimated at a value of $10,000 (which was donated by Earthtenders). Volunteer labor (45 people) for sorting waste is not included in that cost and it is presumed that similar venues/events would also recruit volunteer labor such as scouts or club members. If the cost of 45 staffers for hundreds of estimated man-hours at $15 per hour is added to planning, it would be a significant expense, but Earthtenders claims that event producers must and have always used volunteers. It is suggested that we find a sponsor to cover any such "green intentions" costs associated with a event refuse management program. Savings are partly determined by how many tons of waste are diverted from the landfill (where a "tipping fee" is charged per ton to accept waste). The 92 percent savings in event trash is also applied to landfill fees, which are valued in the range of $40-90 per ton.

BUT, that's only part of the equation. The materials diverted will now NOT produce greenhouse gasses. When compostables are buried they generate methane--one of the most serious greenhouse gasses (GHG). When materials are composted, methane is avoided. The compostables and recyclables will not consume finite landfill space either. And the products generated by recycling and composting will preserve resources, which would otherwise have been consumed (i.e., making new glass from virgin minerals instead of remaking glass from old glass; making fertilizers from mined minerals, (which is very resource intensive and limited in supply) rather than composting waste materials, which would otherwise fill landfills and generate methane.

In 2009, Earthtenders' composting aficionado, Eva Christensen first worked for was >Cont'd on p.27>

SOLAR PV. . .

SOLAR PV...

Solar Technologies

By Shasta Small, Brett Tofel

PV, GRID TIED

For residential and commercial applications there are various types of photovoltaic systems. In our region, the most standard type uses a flat plate module. These modules usually carry a 25 year manufacturer's warranty and an average 10 year warranty for inverters. In Vermont, photovoltaic systems up to 10 kW and in New Hampshire photovoltaic systems up to 5 kW qualify for a state rebate and a 30% federal tax credit.

Photovoltaic (PV) electricity is produced from the interaction between the sun's rays and the PV panel (also called a module). PV panels are most often made with silicon, a semi conductive material. The silicon is produced in wafers in a mono-crystalline or polycrystalline form; mono-crystalline wafers are more efficient, but also more expensive than polycrystalline wafers. These conducting wafers are placed flat on a panel and covered with tempered glass for protection from the weather. When the sun's rays hit the panel they travel through the glass to be reflected by, travel through, or absorbed by the silicon atoms. Those frequencies that are absorbed by the silicon effectively "bump" an electron out of each silicon atom. The wafers are aligned such that the bumped electrons travel in the same direction.

These electrons form a direct current of electricity which travels to a box called the DC disconnect which serves as a breaking point between the direct current and the inverter. When the DC disconnect is on, the electric connection is closed, so electricity can flow through the disconnect to the inverter. When it's off, the electric connection is open and the electricity is in an open circuit, so it doesn't travel to the inverter. When the electricity arrives at the inverter, the DC electricity is inverted into alternating current (AC) at the specified output of the inverter. The electricity then travels out of the inverter in AC form to an AC disconnect, similar to the DC disconnect. Then the power goes to the main distribution panel where the standard electrical (grid-tied) service enters the building.

Your home will first use all the power it can from the PV system and then draw from the grid if it requires additional power. If your PV system produces power in excess of your home's demand, then the excess electricity will flow out of the distribution panel through your meter (which will spin backwards) and out to the grid.

For example, if your home requires 20 kWh per day and your PV system produces 10 kWh per day, then you will draw 10 kWh from the grid. If your system produces 30 kWh per day, then you will sell 10 kWh to your utility. This situation is called "net-metering" because in reality your electric demand is instantaneous so your meter may run both forward and backward in the same 24 hour period. Usually, an appropriately sized system will cause the meter to run backward most of the summer, which creates a large credit on the electric invoice. In the winter, the meter will usually run forward, drawing power from the grid, and using up that credit. By the end of the year with an appropriately sized system your net bill should be zero!

MONITORING SYSTEMS:

Monitoring systems are an optional way to have a close look at your PV system at all times. The basic purpose of the monitoring system is to give you direct information, available on a monitor screen or online, about how much energy your PV system is producing. More advanced monitoring systems can monitor outdoor weather conditions and building demand conditions (how much energy your house is using).

PV, OFF-GRID

In an off-grid system, everything is the same as a battery-backed on-grid except that the battery banks are larger and generally designed to provide power, or autonomy, throughout most expected overcast periods. In order to determine the size of your off-grid system, the solar designer does a calculation for "days of autonomous operation". This calculation is driven by the amount of electric load you have and how long you want to run your home electric loads.

Sometimes this calculation yields a battery and solar array size that is too large to be affordable. In this case, it may be desirable to add a generator into the system to allow for battery charging during gray and low light winter days. Such hybrid systems allow homes to be primarily powered by the sun, but allow the user to start small and scale up. Unlike generator-only systems, in a hybrid system, even when needed on a given day, the generator only tends to run for 1-3 hours per day.

Batteries are usually the weak point of an off-grid system as they are constantly charged and discharged. Warranties on batteries are always pro-rated to account for normal usage. Monitoring systems are included and recommended for off grid systems.

WHICH TECHNOLOGY SHOULD I INSTALL?

If financial considerations are a priority, then, in general, a solar hot water system will give you the fastest payback. In some cases, the opposite may be true: if you have a low cost water heating fuel with high electric bills and you are able to take advantage of all the PV incentives, then perhaps PV will offer you a shorter payback time. A solar hot water system can pay for itself in as little as 4 years up to 10 years. A solar PV system can pay for itself in about 8-15 years. Either way, your energy system will last much longer than it takes to pay for it, so you will indeed start claiming free energy at some point.

If you prefer to base your decision on environmental factors, then you should determine which part of your home uses the most fossil fuel. For instance, if you are using an oil-burning hot water system, then it would be best to replace that first. Because each home is unique, there is no "one size fits all" answer for which technology is best for you. Most installers will be happy to talk through the pros and cons of any installation, and give you energy production estimates.

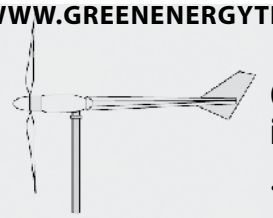
BATTERY-BACKED:

A grid-tied, battery-backed PV system operates in the same manner as described for a grid-tied system, except that additional hardware is required – batteries and a charge controller. In this case, the PV system is wired to the batteries via a charge controller, which accept DC power. The charge controller determines when the batteries need to be charged. Once the batteries are full, the electricity essentially "skims" over the battery and goes through the DC disconnect to the inverter where it follows the usual path to your home.

When a grid failure (power outage) occurs, your house will begin to consume the electricity from the fully charged battery. In this case, your main distribution panel will shut down and the inverter will send power to a second panel in your home called the "critical loads" panel. The homeowner will have already decided which appliances in the house are "critical" and those items will be powered by this panel. The battery will send power to this panel as long as the battery has some charge.

If it's daylight and sunny, the PV system will continue to charge the battery even as the house is drawing from it. If the critical appliances are not in use, the inverter will "talk" to the charge controller and force the PV system into an open circuit so that the battery does not become over-charged. At night, or in a dark overcast situation, the PV system won't charge the battery, so you may only use the power that's in the battery and no more. Once the battery capacity gets too low, the house will stop drawing and will have no power until the grid comes back on or the sun comes back out. If you are looking for a fail safe way to avoid power outages and produce electricity independently of the grid, see off-grid systems.

WIND



http://www.energysavers.gov

Small Wind Electric Systems

Small wind electric systems are some of the most cost-effective home-based renewable energy systems. These systems are also nonpolluting.

If a small wind electric system is right for you, it can do the following:

- Lower your electricity bills by 50%–90%
- Help you avoid the high costs of having utility power lines extended to a remote location
- Help uninterruptible power supplies ride through extended utility outages.

Small wind electric systems can also be used for a variety of other applications, including water pumping on farms and ranches.

How a Small Wind Electric System Works

Basics of how a small wind system produces electricity

Wind is created by the unequal heating of the Earth's surface by the sun. Wind turbines convert the kinetic energy in wind into clean electricity.

When the wind spins the wind turbine's blades, a rotor captures the kinetic energy of the wind and converts it into rotary motion to drive the generator. The manufacturer can provide information on the maximum wind speed at which the turbine is designed to operate safely. Most turbines have automatic overspeed-governing systems to keep the rotor from spinning out of control in very high winds.

Grid-Connected Small Wind Electric Systems

Small wind energy systems can be connected to the electrical distribution system. These are called grid-connected systems.

A grid-connected wind turbine can reduce your consumption of utility-supplied electricity for lighting, appliances, and electric heat. If the turbine cannot deliver the amount of energy you need, the utility makes up the difference. When the wind system produces more electricity than the household requires, the excess is sent or sold to the utility.

With this type of grid-connection, note that the wind turbine will operate only when the utility grid is available. During power outages, the wind turbine is required to shut down due to safety concerns.

Grid-connected systems can be practical if the following conditions exist:

- *You live in an area w/ ave. annual wind speed of at least 10mph (4.5 m/s).*
- *Utility-supplied electricity is expensive in your area (about 10-15¢/ kWh)*
- *The utility's requirements for connecting your system to its grid are not prohibitively expensive.*
- *here are good incentives for the sale of excess electricity or for the purchase of wind turbines.*

Metering & Rate Arrangements for Grid-Connected Systems

The Public Utility Regulatory Policy Act of 1978 (PURPA) requires power providers to purchase excess power from grid-connected small renewable energy systems at a rate equal to what it costs the power provider to produce the power itself. Power providers generally implement this requirement through various metering arrangements. Here are the metering arrangements you are likely to encounter:

Net purchase and sale

Under this arrangement, two uni-directional meters are installed- one records electricity drawn from the grid, and the other records excess electricity generated and fed back into the grid. You pay retail rate for the electricity you use, and the power provider purchases your excess generation at its avoided cost (wholesale rate). There may be a significant difference between the retail rate you pay and the power provider's avoided cost.

Net metering

Net metering provides the greatest benefit to you as a consumer. Under this arrangement, a single, bi-directional meter is used to record both electricity you draw from the grid and the excess electricity your system feeds back into the grid. The meter spins forward as you draw electricity, and it spins backward as the excess is fed into the grid. If, at the end of the month, you've used more electricity than your system has produced, you pay retail price for that extra electricity. If you've produced more than you've used, the power provider generally pays you for the extra electricity at its avoided cost.

The real benefit of net metering is that the power provider essentially pays you retail price for the electricity you feed back into the grid.

Some power providers will now let you carry over the balance of any net extra electricity your system generates from month to month, which can be an advantage if the resource you are using to generate your electricity is seasonal. If, at the end of the year, you have produced more than you've used, you forfeit the excess generation to the power provider. ♻

Alteris Renewables Completes Heritage Flight Wind Turbine

The Heritage turbine in South Burlington, VT

Heritage Aviation, a General Aviation Facility at the Burlington International Airport, became the first aviation facility in the US to have an on-site wind turbine. In December 2009, Heritage selected Alteris Renewables to install the Northwind 100 in conjunction with the installation of a solar electric and solar domestic hot water system on their building. These renewable energy installations are a part of Heritage Aviation's process to qualify their new office and hangar facilities for LEED certification.

Specifications:

- Installation Type: Community Wind
- Location: South Burlington, VT
- Date Completed: Dec 2009
- System Size: 100 kW
- Type of Turbine: Northwind 100
- Tower Height (m): 30
- Rotor Diameter(m): 21
- Estimated Power Generation (annually, kWh): 135,121
- First year electricity rate savings: $19,863

Environmental Benefits:
(assuming 25 yr system lifetime)

- Reduces CO2 emissions 123,019 lbs ove the life of the system
- Equivalent to planting 25,100 trees
- This is the same as eliminating 5,980,200 driving miles

Quote from Customer about working with Alteris Renewables:

"Transforming systems of energy supply, delivery and consumption to be more sustainable and renewable is where the world is heading. When an opportunity to bring a new facility on line surfaced, we wanted to be on the forefront of that effort. Our goal is to have the least environmental impact possible while simultaneously meeting and exceeding the requirements and expectations of the markets and customers we serve. In our opinion, all industries have an obligation to use resources and energy more efficiently and aviation has, and will continue to, rise to the occasion."

- Heritage Aviation President Christopher Hill

Contact: Alteris Renewables, www.alterisinc.com

David Blittersdorf's

VIEW FROM THE TOP

'Clean' vs Renewables

"Clean energy." Sounds so sweet, - *wholesome as Mom & apple pie.* Who could be against *"clean energy"? No one* – I'm not. Truly renewable energy from wind, sun, water and the earth is as clean as it gets, and I've built my life's work around developing and supporting technologies that will allow us to harness these delightfully clean renewables.

But lately the clean energy waters have been muddied, as fossil-fuel and nuclear energy industries have been dumping their dirty laundry into the PR washing machine, or rather, the "spin" cycle of attempting to rebrand their industries as beneficial and helpful. The HYPERLINK "http://www.cleanskies.org/"American Clean Skies Foundation, an organization with direct ties to the natural gas industry, advocates that the U.S. increase consumption of that particular fossil fuel by developing it for transportation and building more natural gas power plants. The HYPERLINK "http://casenergy.org/"Clean and Safe Energy Coalition is a pro-nuke organization that tries to reframe the industry that brought us Three Mile Island and Chernobyl as safe, cheap, reliable – and above all, clean.

Why should we care why coal, nuclear, and the whole fossil-fuel industry are framing themselves as "clean"? Because they are dirty and bad for our world. Nuclear waste has a minimum shelf life of a thousand years, and we have no real plan to deal with it safely - the more nuclear power plants we have on our planet, the more waste we will have here, too. If storage canisters leak, the damage will be permanent: Anti-nuclear-proliferation and counterterrorism experts call explosives laced with radioactive nuclear waste "dirty bombs" because the radioactivity, once in the environment, is nearly impossible to clean up. Natural gas and coal are both carbon-based fossil fuels, and we get energy by burning them. Every aspect of their production and consumption is dirty - mining, storing, transporting, processing and combustion, but primarily they are dirty because consuming them releases carbon into the atmosphere.

There are not and will never be such things as "clean coal," "clean nuclear," "clean oil," and "clean natural gas." Saying something doesn't make it so, and we should not be tempted to put full-throttle development of true renewables on hold just because some existing technologies are marginally cleaner than the worst existing technologies. Many of the big multinational energy companies that have relied upon fossil fuels for years to drive profits are finally starting to understand that the future is wind, solar and other renewables, but these energy behemoths must sustain their current dirty business units by selling us the "clean energy" story.

>> CONTINUED ON P. 10>>

SOLAR HOT WATER

For residential and commercial applications there are various types of solar hot water collectors. In our region, the most standard types are flat plate and evacuated tube collectors. In general, these collectors carry a ten year warranty. In Vermont and New Hampshire there are state rebates for installing a hot water system and a 30% federal tax credit as well.

FLAT PLATE COLLECTORS:

A flat plate collector looks like a skylight, it is a dark colored aluminum box with a glass top . This box contains a closed loop of propylene glycol (a non-toxic antifreeze) mixed with distilled water. This mix is referred to as the heat transfer fluid (HTF). The sun's rays travel through the glass top, strike the absorptive coating on the loop containing the HTF and heat it up. The hot HTF travels through the collectors on the roof and then back to a heat exchanger in the house.

The HTF and domestic water never touch, but the HTF gives up its heat constantly to the domestic hot water stored in a tank. When hot water is called for in the house, the water will come from the solar hot water storage first and then be supplemented by the existing hot water system as needed. An energy savings occurs because less heating fuel is needed to heat the water to ideal warmth.

Collector loop temperatures can approach 170 deg. F on a sunny hot day. Storage tank temperatures can reach the same temperature, depending on house demand. Mixing valves are installed to limit the temperature of water reaching taps in the home to safe limits.

Solar hot water systems are ideally roof-mounted, but can also be ground mounted near the home. These systems can be powered by a single PV panel if you are off-grid!

SOLAR HOT WATER

EVACUATED TUBE COLLECTORS:

This type of system works similarly to the flat plate collector system. The main difference is the collector itself. An evacuated tube collector consists of several long tubes. Inside the tubes are pipes surrounded by a vacuum. The HTF flows through the pipes within the vacuum. The vacuum allows the sun's rays to enter the tube, while limiting the amount of heat leaving the pipe. This means that when clouds cover the sun, the pipes will stay hot longer than with a flat plate collector. On the other hand, flat plate collectors are more efficient in full sun conditions.

ON DEMAND WATER HEATERS:

Endless hot water, and saving energy costs at the same time – your family will thank you and you'll wonder why you didn't get one before!

Tankless instantaneous water heaters are more energy efficient than tank heaters. With no storage capacity, they only have a very small amount of water inside which flows thru a heating coil. When you turn on the hot tap, the water heater senses the water flow and starts up the heater to heat the water as it flows thru the unit with a heating coil. The outlet temperature is hot by the time it comes out of the water heater and flows to your faucet.

The most common type of on demand water heater is the natural gas or propane fired units. When there is a demand for hot water, the gas flame comes on and very quickly provides hot water, essentially instantaneous, with the only actual delay at the faucet being the time for the hot water to flow thru your water piping from the heater to the faucet. ♻

Green Guru: Tubes vs. Flats

by Dave Bonta July 26, 2010

Solar Water Heating has been around a long time. The first patented solar water heating system came out in the latter part of the 19th century. The concept is simple enough-the Sun strikes a dark object (like a dark green garden hose) & warms it up. If there is water running thru it, it gets hot. So the question isn't whether it works or not, the real issue is how to do it as efficiently as possible.

If you take a flat sheet of copper, spray paint it with high temperature black stove paint & lay it on the ground in the Sun, guaranteed, it will get hotter than the garden hose. If you tack some copper tubing on it run some water thru it, that water will get hot. To make it work better still, encase it in an insulated box & cover it with glass to create a greenhouse effect by trapping more heat in the space. You now have a nifty effective solar flat plate collector. These have performed very well for thousands of people around the World for decades. So why reinvent the wheel?

Here is why. Flat plates have some draw backs in certain applications & it was for those particular situations evacuated tubes might be a better choice. It is not really one technology vs. another. It's more like one or the other. The difference is subtle but important. There is no magic bullet that is going to work for every application, every time. It's not as simple as Flat plates Good, Tubes Bad, or vice-versa. The smart money is on figuring out the right choice for a particular application.

When we think about how heat is created, moved about, captured for work or lost altogether, we have to look at its "escape mode". For a desperate little BTU trying to escape to a cold place, there are only three ways to go; Conduction, convection & radiation. The next time you shake hands with someone, & they feel warmer than you, you are taking some heat away in the exchange. If they feel colder, than you are transferring heat to them. You have become a "Thermal Bridge". That's conduction. You're conducting heat while you shake hands.

If you are outdoors on a cold day & blow heat into your hands, that's convection. The warm air coming from your body transfers heat from you to your hands by the air. Heart from a furnace does the same thing. Stand in the Sun & feel the warmth on a January day, with a black jacket on. Radiation at work. The Suns radiant energy is working for you. Your black jacket is a solar collector, not terribly efficient at storing heat but it works to an extent.

For the purposes of heating hot water we want to minimize these three btu escape routes & get all the btus rounded up into a water tank. The flat plate collector does a good job harvesting them up & delivering most of them into a tank. But what if it isn't facing the right way? What if it's really cold, windy & cloudy outside? What if it's sixty feet from the house? How well would it work in those situations? In those instances we would consider an evacuated tube collector.

Evacuated tube collectors are single vacuum tubes, purged of all air, with a phase change medium, usually glycol & water, also under vacuum. Each tube functions as an individual collector. Under vacuum, the phase change from water to steam happens very rapidly at lower temperatures. They are usually "plugged in" to a manifold, that is, they are not soldered or fixed into place. *That allows for them to be spun to a certain degree, allowing more perpendicular Sun strike, head on.* This is of particular appeal when the roof orientation might be say, fifteen degrees from perfect orientation. They are individually lighter weight so installing them can be much faster. Flat plates are heavier & to tilt it might mean hiking it up on one side to maximize Sun strike. We call this the "Coney island look" & contributes to the prejudice that solar is awkward looking & ugly.

So in a lot of cases, evac tubes are chosen for their orientation ability, aesthetics or design flexibility. They can be mounted on gable end walls & have interesting architectural appeal as porticos, awnings, etc. Evacuated tubes have no air in them. Consider double pane windows. Even they have rare gas in them; argon, krypton, etc.

They reduce heat loss by not allowing desperate freedom seeking BTU's to migrate from the warm indoors to the cold outdoors. They have a harder time hitching a ride on the spread out, lighter than air molecules found in the great divide. What would work better than rare gas? Nothing. Nothing at all. Nothing is a vacuum. Now, Nature might abhor a vacuum, it's true, but it makes one hell of an insulator. No molecules for transferring heat, no thermal bridge. The heat stays where it is & goes where it is supposed to go. So, no conductive or convective heat loss. If we are placing this collector in a cold environment, 60' from the tank in the house, we want to maximize every BTU we can get a hold of. If we are doing something crazy, like trying to heat space in cloudy cold VT, the choice becomes pretty obvious.

TUBES VS. TUBES

To confuse the matter yet more, there are several kinds of tubes available these days; true Heat pipe type in a single wall & double wall "thermos bottle" style that have a shell of vacuum surrounding a chamber of air at normal atmosphere.

The theory of operation is supposedly the same, but the more efficient type would be the full vacuum version. It's just going to get more Sun Strike owing to its single wall design, & the Btu's it collects are going to be more effectively captured in its molecule free environment.

The double wall types do work, but you need more, sometimes twice as many to get the same results.

There are two or three types of single wall vacuum tubes available & many dozen "knock offs" of the double wall variety.

BTU for BTU, the single wall type are the better value, but generally the doubles sell based on what seems to be a lower price. & if price is the only concern it would be hard to beat that Garden hose! ♻

TRANSPORTATION

National Car Rental Fined Nearly $500K for Diesel IDLING VIOLATIONS at Logan & Bradley Airports

Boston, MA – July 19, 2010 – Pending court approval, several companies affiliated with National Car Rental will pay a fine of $475,000 for repeated violations of motor vehicle idling regulations at two New England airports: Logan Int'l in Boston, MA and Bradley Int'l near Hartford, CT.

On numerous occasions in 2006 and 2007, EPA investigators observed the shuttle buses that carry passengers from the airport terminal to the rental car locations idling excessively. At the time, Vanguard Car Rental USA Inc operated the National Car Rental facilities at Logan and Bradley Airports. The current owners and operators of these facilities are Enterprise Rent-A-Car Company of Boston, LLC, and CAMRAC, LLC. Both Massachusetts and Connecticut have clean air regulations which limit motor vehicle idling (to five minutes in MA and three minutes in CT) with exceptions allowed for vehicles undergoing maintenance, making deliveries or in extreme cold conditions.

"Here in New England, we suffer from disproportionately high asthma rates," said Curt Spalding, regional administrator of EPA's New England Office. "Diesel pollution is very harmful, especially for sensitive populations such as the young, elderly and people who suffer from asthma. It is critical for the health of the surrounding community that companies like National Car Rental comply with anti-idling laws."

EPA had documented idling violations at Logan Airport dating back to 2002. Since taking over from Vanguard in mid-2007, Enterprise Rent-A-Car and CAMRAC have been taking steps to address excessive idling at the Logan and Bradley facilities, including more management oversight, posting no-idling signs, installing electronic idling controls and retraining drivers.

The Consent Decree, lodged in federal court and requiring approval by the court, requires the companies to continue with anti-idling measures, such as driver training, daily management walk-throughs to monitor idling, maintaining electronic idling controls and posting of no-idling signs.

Diesel emissions contribute to a number of serious air pollution problems such as smog, acid rain and increased carbon concentrations in the atmosphere. In New England, diesel engines are the third largest human-made source of fine particles, contributing more than 20 percent of fine particle emissions. Fine particles can cause lung damage and aggravate respiratory conditions, such as asthma and bronchitis. Based upon human and laboratory studies, there is also considerable evidence that diesel exhaust is a likely carcinogen.

Idling engines typically waste up to a gallon of fuel per hour. As a result, it makes good economic and environmental sense to minimize idling. Moreover, idling is harmful to engines, increasing maintenance costs and shortening engine life. For a wait time of more than a few seconds, turning off the engine saves fuel, protects the engine, and helps improve air quality.

More Information: The consent decree, lodged in the U.S. District Court, will be subject to a 30-day public comment period and approval by the federal court. Once it is published in the Federal Register, a copy of the consent decree will be available on the Justice Department website: http://www.justice.gov/enrd/Consent_Decrees.html. Diesel exhaust and anti-idling guidelines: www.epa.gov/ne/eco/diesel.♻

Anti-Idling Regulations

Transportation and Regional Programs

Office of Transportation & Air Quality
U.S. Environmental Protection Agency

Vermont Municipal Codes

Burlington Code of Ordinances, Sec. 20-55

(e) No person shall leave idling for more than five (5) minutes any motor vehicle in any area of the city during the period from April 1 of every year to November 1 of the same year, except in the following instances:
(1) Motors used to run refrigeration units may be left idling to permit uninterrupted refrigeration;
(2) A motor vehicle may be left idling if necessary for the repair of that vehicle;
(3) This provision shall not apply to motor vehicles which must be kept idling in order to install, maintain or repair equipment or infrastructure.
(4) This provision shall not apply in any situation in which the health or safety of a driver or passenger requires the idling of the vehicle.

For more information on state and local idling reduction laws, please visit the SmartWay Transport Partnership Web site at: http://www.epa.gov/smartway/index.htm

NH Code of Administrative Rules

Env-A 1101.05 Operational Requirements for Diesel-Powered Motor Vehicles. The owner or operator of a diesel-powered motor vehicle shall comply with the following operational requirements unless specifically exempted from the operational requirements for diesel-powered motor vehicles: (a) When the temperature is above 32ºF, a diesel engine shall not idle for more than 5 consecutive minutes; (b) When the temperature is -10ºF, 32ºF), or anywhere in between the 2 temperatures, a diesel engine shall not idle for more than 15 consecutive mins; or (c) When the temperature is below -10ºF, and where no nuisance is created, a diesel engine shall not be subject to idling restrictions.

Env-A 1101.06 Exemptions From the Operational Requirements for Diesel-Powered Motor Vehicles. The owner or operator of a diesel-powered motor vehicle shall be exempted from the operational requirements for diesel-powered motor vehicles when any one of the following conditions exists: (a) When a diesel-powered motor vehicle is forced to remain motionless because of traffic conditions over which the operator has no control; (b) When a diesel-powered motor vehicle is being used as an emergency motor vehicle; (c) When a diesel engine is providing power takeoff for refrigeration, lift gate pumps or other auxiliary uses, or supplying heat or air conditioning necessary for passenger comfort in those vehicles intended for commercial passenger transportation; (d) When a diesel-powered motor vehicle is being operated by a mechanic for maintenance or diagnostic purposes; or (e) When a diesel-powered motor vehicle is being operated solely to defrost a windshield. ♻

The Eco Index-Measure Products & Brands

by Roger Lohr

New software has been created by a group of companies representing about 100 apparel brands to measure environmental impact of products from "cradle to grave" or more explicitly, from raw material to garbage dump.

According to an article in the Wall Street Journal, this so-called Eco Index will perform similar to the Energy Star rating of appliances. The Eco Index concept will be officially announced in August 2010 at the Outdoor Retailer Show in Salt Lake City. It will provide comparative perspectives of brands with relation to environmental and human rights issues. Another way of looking at it is as a sustainability barometer for operations or a litmus test for product greenness.

This project has been underway for three years and the coalition of brands involved include Nike, Levi Strauss, Target, Adidas, Timberland, Columbia, and Patagonia. Most consumers are not aware of factors involved with the apparel business such as the toxic chemicals used for leather tanning, crude oil used in the manufacture of synthetic fabrics, incredibly low wages and no benefits for foreign workers, and excessive shipping distances for manufacturing various aspects of apparel. In 2008, Americans discarded 12.4 million tons of textiles, up from 1.8 million tons in 1960.

The Eco Index software provides a self-reported score of points on various questions regarding raw material, production, shipping, and disposal. A brand can score points with for example, a wastewater purifying system, a recycling program, good labor standards, less bulky packaging, and even washing in cold instead of hot water. There are estimations involved in the scoring system and proof is not required, but this could be the infancy in the development of international standards.

The Eco Index is a beginning but we do not know how much of a motivational factor that it may become in the eyes of consumers. It is admirable that competitors have come together to work on this concept and most of the participating companies have previously undergone an internal analysis of these issues. Environmental issues are driving some product design these days such as printed info on garments instead of separate tags and using less or recycled packaging. And not surprisingly, many of the applicable design ideas save processing costs, too. If the Eco Index succeeds and companies vie for a higher score, we all will win. ♻

EPA GREEN VEHICLE GUIDE

2010 Vehicles with 34 mpg +

FORD Escape Hybrid	34mpg
HONDA Insight 1.3 4 CVT	43mpg
HYUNDAI Accent 1.6	36mpg
HYUNDAI Elantra 2 4 Auto-4	34mpg
KIA Forte 2 4 Auto-5	36mpg
KIA Rio 1.6 4 Auto-4	36mpg
LEXUS HS 250h	35mpg
MAZDA Tribute Hybrid	34mpg
MERCURY Mariner Hybrid	34mpg
MERCURY Milan Hybrid	41mpg
MINI Mini Clubman 1.6	36mpg
MINI Mini Cooper 1.6 4	37mpg
NISSAN Altima Hybrid	35mpg
PONTIAC G5 XFE	37mpg
Cabriolet 41 SMART ForTwo Coupe	41mpg
TOYOTA Camry Hybrid	34mpg
TOYOTA Prius	**51mpg**
VOLKSWAGEN Golf	41mpg
VOLKSWAGEN Jetta	42mpg

http://www.epa.gov/greenvehicles/Download.do

CK out the 2011 HONDA CR-Z: Green Exhilaration!!

by Andrea G. Green

Looking for a "GREEN" vehicle option, but don't want to lose the FUN? The 2011 Honda CR-Z may be just the car for you!

Honda's newest hybrid comes in the form of a 2-pass. sport coupe, powered by a 1.5 liter i-VTEC engine with Honda's Integrated Motor Assist (IMA) hybrid-electric system. Equipped with a revolutionary 3-mode drive system, the CR-Z allows the driver to choose between Normal, ECON™, and SPORT modes. Normal will be for most city driving and when it's set on ECON™, the CR-Z drives like a hybrid – maximizing efficiency and economy. Drivers seeking FUN will take advantage of the SPORT mode, with the CR-Z getting some extra pep from a program change in engine tuning.

Available in both a 6-speed manual transmission and an automatic CVT (Continuously Variable Transmission), the 2011 CR-Z offers the driver quick, sporty handling in three trim levels., with Honda Satellite-Linked Navigation System option.

There are many noteworthy aspects such as the price! Depending on the transmission, the CR-Z is rated for up to 39 MPG*! The 2011 CR-Z's EPA rating of 31-35 MPG City and 37-39 MPG Highway will be very easily exceeded by conscientious drivers. Many drivers who consider themselves "hypermilers" (those who increase their car's gas mileage by making skillful changes in the way they drive) find EPA ratings to be on the low end of their actual MPG's.

Get ready for the exhilaration with the 2011 Honda CR-Z: it is set to debut at dealers on August 24th !!

**Based on 2011 EPA mileage estimates, reflecting new EPA fuel economy beginning with 2007 models. Use for comparison purposes only. Do not compare to models before 2008. Your actual mileage will vary depending on how you drive and maintain your vehicle.*

TRANSPORTATION

Help the Gulf Oil Issue
Stop Using So Much Oil

By Nancy Rae Mallery

The horrific disaster of the Gulf oil spill has people wondering how they can help?

The most meaningful action one can take is to address the long-term consequences of this dependency on oil that we have. These consequences that don't just include spills, but everything from global warming to political instability. The biggest and smallest thing you can do is to stop using so much oil! Every drop you don't use matters.

♻ Use public transportation and ask them not to idle. Give them a copy of Green Energy Times' article from the Transportation page (8). Or have them read it on our website in either the current and past issues or on the previous post.

♻ Carpool - again please don't idle and spread the word (see note in paragraph above)

♻ Bike more often than you drive.

Make your next car a fuel efficient one, including an option for an electric vehicle.

♻ Be aware of oil-derived products that you use like plastic and support companies that use recycled content with their product and refill your containers at food stores like coops that carry both foods and cleaning products in bulk so that you can do this.

♻ Strive to reduce your gas consumption no matter what car you drive or lawn you mow.

♻ If you heat your home with oil, learn how to reduce your energy usage by utilizing the weatherization incentives available to button up your homes. Seal those leaks. Insulate with appropriate materials that will actually keep your heat loss to a minimum. Then replace your furnace with one that will use not only less fuel to operate, but will need less because of the energy saving measures you have taken!

♻ Support power companies that support Renewable energy sources and do not condone the use of coal *(there is NO SUCH THING AS CLEAN COAL!)* or nuclear (it is just too dangerous & unsafe).

♻ Urge industry and leaders to clean up old oil-fired power and nuclear plants.

♻ Support comprehensive energy legislation that will move the nation from a dependence on fossil fuels like oil and coal to more renewable energy technologies, like solar, small hydro, wind, and geothermal. ☀

COMMUTING IN THE UPPER VALLEY

By Jen Phipps

When it comes to commuting in the upper valley it is all about options & planning ahead. There are many options for getting around in the Connecticut River Valley, many of which allow for bicycles & are Handicap Accessible. Discounts are available for students & seniors. Contact the agency to view schedules & fares. Whether getting around town, commuting or planning a day trip leave the driving to someone else, enjoy the ride & help save our planet (it will also probably cost less than using your own vehicle). There are services for commuters, tourist, & shoppers. It is time to consider & try something different & plan on using these services for your daily routine.

Don't forget about the train & carpooling, for which there are many ways to connect to them. Park n Ride lots are there to use. Keep 'em full!

Stage Coach provides commutes from Randolph & D'mth, shopping trips & the Randolph Village Maxi Taxi. *Trips to Shaws, Randolph Ctr. & Mobile Acres, w/in the village are pd for by Shaws.* http://www.stagecoach-rides.org (800) 427-3553

Rural Community Transportation Inc. serves St. Johnsbury. http://www.riderct.org

Advance Transit will get you around Lebanon, Hanover & Dartmouth http://www.advancetransit.com/ (802) 295-1824

City Express services Keene http://www.hcsservices.org/services/transportation/cityExpress.php

Chittenden County Transportation Authority is Burlington's bus service with links to Montpelier, Middlebury & commuter route to Milton. http://www.cctaride.org

Marble Valley Regional Transit provides transportation around Rutland with connectors to Killington a Manchester & Poultney & a commuter from Rutland to bellows falls. Service is free on Saturday for most of the City routes (Check for details). http://www.thebus.com/

Connecticut River Transit provides services in & around Bellows Falls & Springfield. http://www.crtransit.org

Green Mountain Transit Agency Provides local service in Barre, Montpelier, Grand Isle, Stowe & Lamoille connecting with commuter services. http://gmtaride.org

Green Mountain Railroad has day trip specials available from White River, the Champlain Valley , Bellows Falls & Rutland http://www.rails-vt.com/

Dartmouth Coach (800) 637-0123 http://www.dartmouthcoach.com/

Amtrak http://www.amtrak.com (800) 872-7245 Long distance train service. Offers discounts for AAA membership & student advantage card

Grey hound/Vermont Transit http://www.greyhound.com/HOME/en/NewBuses.aspx Grey hound/Vermont Transit long distance bus services

Cape Air connects Lebanon & Rutland to New York & Boston. http://capeair.com

Lake Champlain Ferries http://www.ferries.com/ Providing transportation between NY & VT via Lake Champlain.

Go Vermont & Upper Valley Ride Share provide support for car poolers. www.connectingcommuters.org http://www.uppervalleyrideshare.com/Ride

The ultimate website for getting around in VT & NH are created by the state agency of transportation. http://www.aot.state.vt.us/links.htm. http://www.nh.gov/dot/nhrideshare/links.htm

Duffy Electric Boats

The Duffy Electric boats have been built in CA for the last 25yrs and have only recently started to be marketed on the East Coast. Tim and Debra Mcshane of Alburg, VT are the exclusive dealers for the Duffy electric boats for VT, NY, NH and the Quebec, Canada market.

The boats range in size from 14' up to 22' with various layout combinations and multiple options, custom built to buyers specification of hull color, surrey top color… The boats are powered by an electric motor that gives an ave. speed of about 5-6 mph and a battery pack charge duration of about 5-6 hours at that speed. They are non polluting and produce no noise of any kind with zero emmissions - environmentally friendly in every way. A full battery charge is obtained overnight from a standard110AC outlet & costs < $2/10 hr. charging duration.

The passenger capacity of the boats ranges from 5 to 11 people with various options available for passenger comfort & enjoyment. The boats come with an all weather cabin enclosure with all around window panels, allowing the boat to operate well into the fall foliage mos., even in New England.

HYDRO

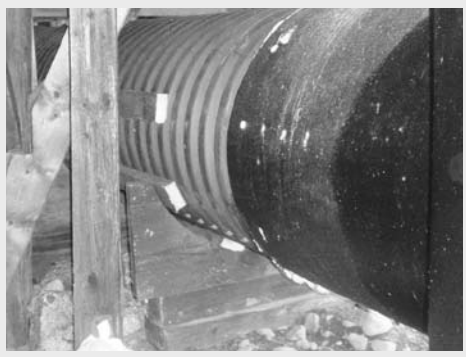
Garland Green Timber...and Electricity

by Dana Southwort

Garland Mill's 15 kilowatt hydro illustrates the Yankee functionality and conservationist spirit at the core of this unique enterprise. The salvaged, and sprightly S. Morgan Smith turbine (c. 1938) that Tom and Harry Southworth installed in 1982 to more efficiently drive their historic sawmill has continued to keep energy costs at zero and has also made the business a net electricity producer for the past 28 years. Water from the Garland Brook is still the power source that saws the lumber in the mill, and generates the electricity that runs the shop (with a **significant** amount left over that goes back into the grid).

The system is straightforward and effective. Water flows through a 3 foot diameter penstock running under the mill, with a total head of 10 feet and flow/volume of roughly 1600 cubic feet per minute. The 21 inch runner on the Francis-style turbine is connected by V-belts to a 30 horsepower induction motor functioning as a generator, and to the sawmill by a split sprocket chain coupling. This allows for either just making electricity when the turbine is spinning (coupling not connected); or to harness the mechanical power (coupling attached) needed to turn the line shafts under the sawmill.

In addition to the many millions of board feet of lumber sawn by water power over the past 154 years, the Garland Mill has also produced around one million kilowatt hours of hydro electricity since 1982. ♻



The Greensboro Small Hydro Project

By Peter Roudebush July 31, 2010

Work on the Greensboro Small Hydro Project stopped in the Spring of 2009. State regulators said they had not permitted a small hydro project to be built in 30yrs were not about to approve it. *Since then some other things have happened:*

1. The Federal Energy Regulatory Commission (FERC) now exempts projects 5MW smaller from federal regulatory review. The VT Legislature, VT Natural Re-sources Dep't are working to interpret the new federal rules. The Federal Energy Act of 2009 provides "stimulus money" to increase small municipal hydro projects.

2. A highly respected professional engineer from St. Johnsbury has taken borings to identify subsoil conditions along the penstock route & discovered no expensive blasting will be required.

3. Beach Road is not a town highway. Abutters contest who owns the road access to the water. Greensboro & Hardwick must address these issues to proceed. A three-rod right-of-way was recorded in 1781, the yr. the town was incorporated, to power three wood-working factories & the grist mill that fed settlers in winter. At that time access to the beach & the Caspian Lake outfall was clearly open to the public. Both towns now maintain Beach Road for their citizens & guests to enjoy kayaking, canoeing, fishing, sailing, & windsurfing. Young swimmers learn-to-swim there & volunteers maintain a milfoil-inspection program to protect the lake's water-quality.

4. The Hardwick Electric Department opposes small hydro, wind & solar projects.. It claims that these systems increase its costs. Joe Wood, board chair of the Hardwick Electric Dep't says "the cost of purchasing electricity is going down, there will only be roughly a 1% increase in the cost of running the department, which costs about 40% of its budget. *The big increase next yr. "subtransmission" will involve upgrades all over New England. The typical new customer represents a loss of revenue for the Hardwick Electric Dep't because he or she uses so little electricity".*

5. Utility experts project electricity costs are on the rise because of high-voltage electricity problems. Information about products, expertise about saving fossil fuels & building & operating small hydro, wind, geothermal, solar systems is growing.

6. Efficiency VT has drawn international attention to VT for reducing energy consumption. Some experts expect this may make demand on fossil fuels moot. Federal incentives are helping railroads move goods & passengers efficiently.

7. Local distribution used to be maintained by local private businesses carrying electricity to their customers. 50 yrs of centralizing energy operations to market fossil fuels have deferred maintaining rural distribution. Many rural areas in New England lack three-phase distribution, the current modern engines appliances are designed to use. The Greensboro Small Hydro Project is designed to improve local distribution. ♻

HYDRO PERMITTING?

Green Energy Times would like to clear up the air about Hydro in Vermont. Have there been any Hydro permits approven in the last 50 years? We searched for some answers, leading us to Brian T. Fitzgerald, Streamflow Protection Coordinator - Vermont Agency of Natural Resources Department of Environmental Conservation (ANR).

To start with, he said that for 20 years, there were no applications (since the 1980's), driven by economics. Today, with there is new interest, due to economics and the incentive programs in place that generally include hydro as a renewable energy option.

Brian has agreed to contribute info in Green Energy Times so that we all understand what is going on and what might need to be addressed to meet today's energy needs, while also maintaining the health of our water, and wildlife. He outlined some key points to start with: • There are regulation requirements for all hydro - small & large. • All Grid-tied Hydro will be subjest to regulation by Federal Energy Regulation Commission (FERC) • There is a well-established regulation process.

There ARE Vermont projects that are being approved and moving forward, after having completed the process. There may still be some hurdles to climb over, but with respect for the environment, wildlife and understanding the regulations, the future of Hydro in Vermont will move ahead.

There may be issues that no longer apply and that need to be addressed, but we need to pursue this option for a cleaner energy future for us all - here in VT, in NH and also the planet.

Our November Hydro section will include more information about Hydro laws and regulations. If you have queations you would like to have answered, please send them to Green Energy Times at info@greenenergytimes.org.

< Cont'd from p. 6 'CLEAN' vs RENEWABLES

Ultimately, the dirty energy industries wish to distract us from their role in the biggest social, environmental, political and economic problem our world now faces. Our unsustainable, fossil-fuel-based world has its accelerator foot pressed pedal to the metal, and we need a way of easing up and applying the brakes. It is important to recognize when consumers are being misled with a "clean energy" label that is false in every major respect. Otherwise we get lulled into thinking that all is well, and that we do not have to worry about carbon, nuclear waste and limited supplies of energy.

I have hope, but we are engaged in a race against time to transition to a new economy of conservation, efficiency and renewable energy. Recurring energy and economic crisis will become the new norm, as we sort out what works and what does not. In this time of rapid change, we must be smart enough to act for the future as we break with what worked in the past, and learn to tell "clean" from dirty.

David Blittersdorf is the President/CEO of AllEarth Renewables in Williston, VT – a company that specializes in the design, manufacture and installation of grid-connected wind and solar renewable energy systems. He is also the founder of NRG Systems in Hinesburg, VT. ♻

Saving Thousand$ with GeoThermal!
. . . in Northern Vermont!

DURING THE SUMMER of 2008 my fuel company sent my wife and I our "budget" amount for fuel oil for the coming winter based on our average use of 1250 gallons per year. It was $500/month based on $4.80/gallon fuel oil. Using my limited math skills, I deduced that I would be spending $6000 for oil to heat my house that winter! Unacceptable.

My well drilling company had been installing geothermal wells for several years and I had been following up with the clients and everyone spoke very positively and enthusiastically about their geothermal experience.

So, I contacted Harold Rist of Smart-NRG.com. He came and looked at my 1860's vintage house with a 40 year old oil furnace. He told me I needed a 4 ton unit to replace the oil furnace. I would have to deepen my well and change my ductwork from 6" to 7". I balked at the 7" ductwork but was told that in order to work properly, the geothermal heatpump had to deliver a higher volume of air to the house. It had to be done.

I also planned to change my conventional submersible pump to a high efficiency "constant pressure" pump large enough to supply not only the geothermal heat pump requirements, but also my domestic water needs.

His plan was to install a standing vertical column system which recylced water from the earth, removing the heat and then returning it to the well column to be reheated. This is called an "Open Loop".

My well, which was 170' deep and produced 10 gpm was deepened to 620' and ended up with 30 gpm. Water temperature was 50°. All the preliminary work was done. The unit was turned on November 3, 2008. The results have been spectacular!

I put the geothermal heat pump, fan and water pump on a separate electric meter so I could tell from month to month exactly what my costs to operate the system were. ♻

As you can see from the attached chart I saved about $5000 that first year. I am far into my second full year and although the price of oil is down considerably from that first year, I'm still on course to save $2500 this year.

A wonderful side benefit of the geothermal system is that I have whole house air conditioning simply by changing the thermostat from "heat" to "cool". It's unbelievable to walk into the house on these 90 degee days and have a cool dehumidified environment. I've saved 2500 gallons of oil during 2 winters.

• *At the time that I installed my system, the federal tax credit was capped at $2000.* ***Now it is a full 30% of the cost of the system including well, heat pump and ductwork.***

I can't say enough about the system. It is green, saves me lots of money and provides a great home environment. I'm hoping that many more people discover this wonderful natural resource that is right under our feet.

• *Heat pumps are rated based on COP or Coefficient of Performance. Mine has a COP of about 3.7. This means that for every unit of energy that goes into the system to run it, I get 3.7 units out. It is cheaper and easier to move energy from the earth to the home than it is to create energy from a fossil fuel. Some units today have COP of over 5!*

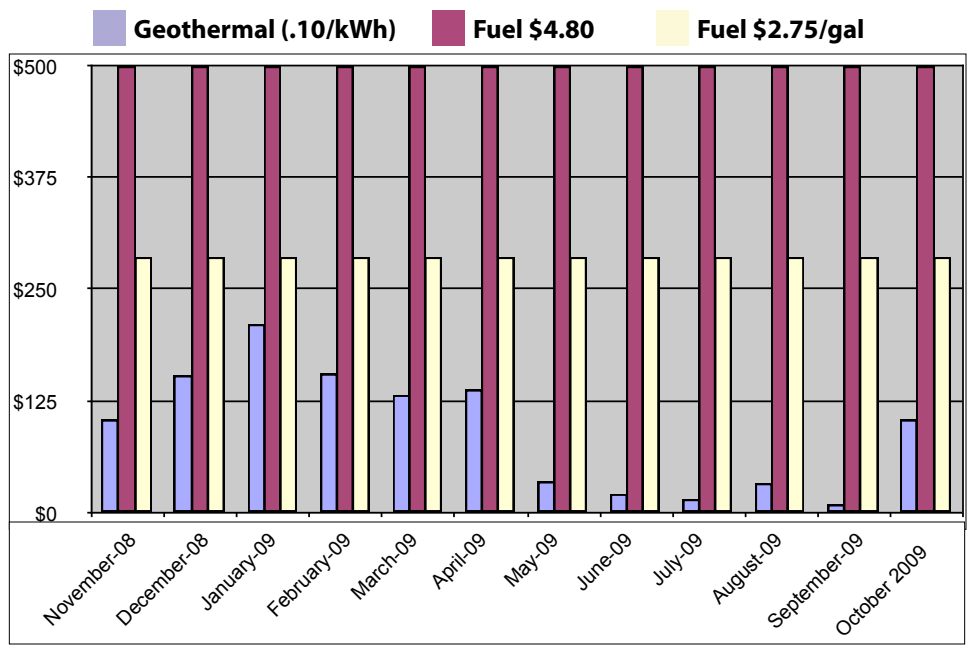
~ by Claude Chevalier, Highgate Springs VT

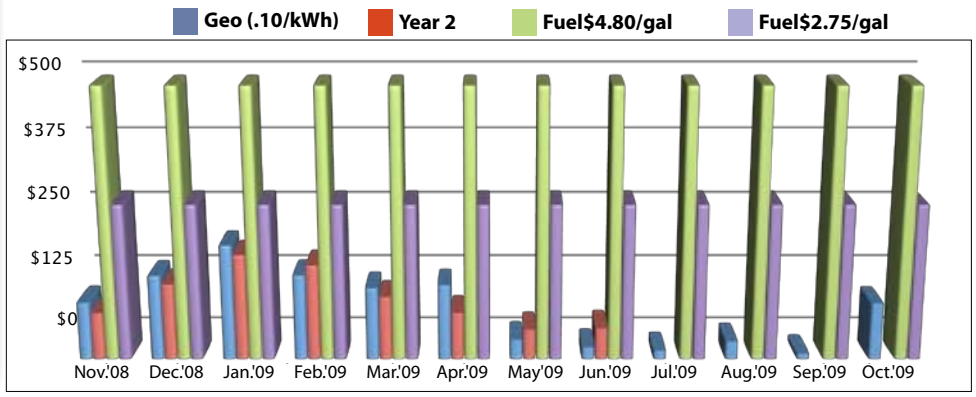
GEOTHERMAL

2008/2009
Cost Comparison
Geothermal vs. Oil
Avg Fuel Oil Consumption 1250 gallons/year

Chevalier Residence
144 Lamkin Street
Highgate Center, VT

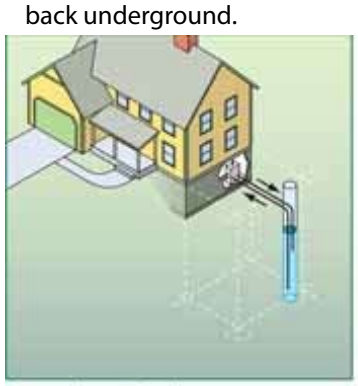
	Heat Pump + H_20 Pump Actual Monthly Bill Geo(.10/kwh)	Second Year 2	Monthly Budget Fuel $4.80/gal	Monthly Budget Fuel $2.75/gal	1st yr kwh used month	1st yr kwh used day	
November-08	$105.64	$86.01	$500.00	$286.45	1020	43	Heating Season: Oct-May $1,039.60
December-08	$154.79	$139.47	$500.00	$286.45	1500	47	
January-09	$211.40	$193.74	$500.00	$286.45	2053	59	
February-09	$156.36	$174.78	$500.00	$286.45	1515	54	
March-09	$132.70	$116.03	$500.00	$286.45	1284	43	3000 ft² house built in
April-09	$138.23	$86.75	$500.00	$286.45	1338	42	1860 with 4"walls and
May-09	$36.04	$55.11	$500.00	$286.45	340	12	stone foundation
June-09	$21.70	$58.11	$500.00	$286.45	200	7	4 Ton Geothermal Unit
July-09	$15.35		$500.00	$286.45	138	4	Water to Air
August-09	$33.06		$500.00	$286.45	311	10	
September-09	$9.83		$500.00	$286.45	64	2	System Started 11/3/08
October 2009 e	$104.44		$500.00	$286.45	1008	32	
Total Annual Cost	**$1,119.54**	**$910.00**	**$6,000.00**	**$3,437.40**			

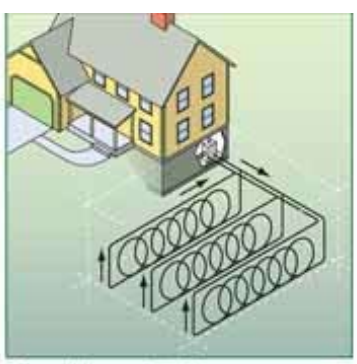


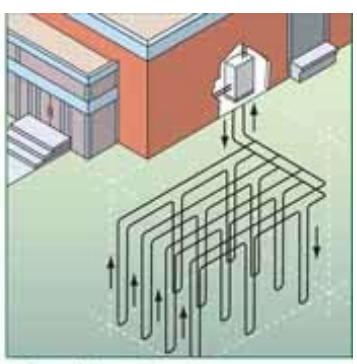


WHAT IS A GROUND SOURCE HEAT PUMP?

- A GSHP system uses electricity to pump heat to and from the ground to heat and cool a building.
- The ground acts as either a heat source for heating or a heat sink for cooling.
- The system includes an electric water pump, to pump the water used to transfer heat to and from the ground, and a type of compressor called a heat pump.
- To provide heating, the heat pump extracts and concentrates heat from the incoming water and trans fers it to a building's heat-distribution system (forced air or water) and/or water-heating system.
- To provide cooling, the heat pump transfers heat from a building's air to water that is then pumped back underground.


Open-Loop Systems


Closed-Loop Systems – Horizontal


Closed-Loop Systems – Vertical

There are multiple GSHP options in the Northeast.

Most installations use open-loop systems, in which groundwater is pumped from a drilled well through a heat pump, which transfers heat into the building, and then most of the water is pumped back to the well. Closed-loop systems circulate a heat-transfer fluid through coils of buried tubing to move heat either to or from the ground.

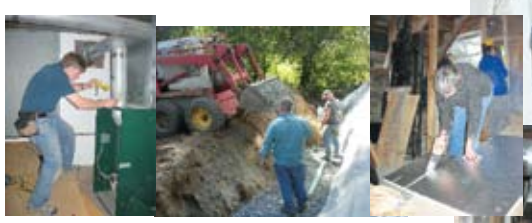
Choosing a system appropriate for the physical characteristics of your property and for your budget requires the design expertise of a GSHP contractor, along with the advice of an unbiased energy professional.

For commercial buildings, this energy professional would be a mechanical engineer who is familiar with GSHP technology and alternatives. For residential buildings, speak with a certified Home Performance with ENERGY STAR® contractor. ♻

Efficiency Vermont

This GSHP info from Efficiency Vermont.
http://www.efficiencyvermont.com

THETFORD CENTER COMMUNITY CENTER VOLUNTEER WEATHERIZATION PROJECT



Sustainable Energy Resource Group (SERG) recently completed a yr-long volunteer-assisted weatherization project of the Thetford Center Community Center - a huge success.

59 community volunteers contributed over 500 hrs of labor on retrofitting and weatherizing the TCCC.

Anticipated overall energy savings from all this work are over 70%. SERG will continue to monitor actual use to verify with hopes that it will serve as a model for other community building retrofit efforts.

Building improvements include:

- Reduced air leakage almost 80%. Blower door tests: from 5886 CFM 50 before work to 1200 CFM 50 at the completion of the project
- Installed 2" foam insulation: basement walls
- Blew 3.75" dense-packed cellulose: walls
- Blew 16" of cellulose in the attic
- Installed curtain drain to keep moisture out
- Restored failing foundation sections
- Installed 150 CFM bath fan, motion controls *to ventilate & maintain healthy indoor air quality*
- Installed a range hood to ventilate combustion gases, cooking odors & moisture
- Installed a high-efficiency sealed-combustion furnace, *to further reduce fuel use & assure proper ventilation of combustion gases.*

Project partners include: the Thetford Center Community Association who supported, promoted the project through fund raising, recruiting volunteers, providing food for work days and the Thetford Energy Committee who provided material & organizational support.

Project financial support was contributed by the Vermont Department of Environmental Conservation, New England Grassroots Environment Fund and Ben & Jerry's Community Action Team, as well as individual and local business donors.

The Preservation Trust of VT for providing technical and financial support to help restore the old schoolhouse windows, and additonal technical support was provided by Efficiency Vermont and Home Performance with ENERGY STAR contractors Rick Bauer, Michael Goetinck, Brent Mellen and Eric Solsaa, and Alex Cherington, Devin Colman, Ann Cousins, Sally Fishburn, Niko Horster, Jared Moats, Kevin O'Hara, Steve O'Malley, Marc Rosenbaum, Andy Shapiro, and Paul Zabriskie

For more information on this and other SERG related programs, contact: 802-785-4126. HYPERLINK "mailto:SERG@valley.net" SERG@valley.net • HYPERLINK "http://www.SERG-info.org" www.SERG-info.org

Are Window Shades the Solution to our Nation's Energy Crisis?

Are window shades the solution to our nation's energy crisis? "Of course not" says Gordon Clements president of Gordon's Window Décor manufacturer of EcoSmart insulating shades, "But they can play a huge role in the move towards energy independence."

To Gordon Clements and his team energy independence can only be achieved by cutting consumption. "All the oil that has been spilling in the gulf over the past three months is equivalent to the amount of oil used by the US in five hours-consumption is the issue" says Clements and he has a unique perspective on one way to reduce energy waste – focus on the heat transfer through the present window stock in the US.

The fact is residential homes consume 21% of the nation's energy and 42% of that energy is spent on heating and cooling, and 50% of that is literally wasted out of windows. An incredible 50% of all that wasted energy, the equivalent of 450 million barrels of oil, could be saved every year in the US if all we did is simply install effective insulating window shades.

For many the inclination has been to install high-tech windows to control this waste. However because of the cost, labor and inconvenience upgrading every underperforming window in every home in the US is unrealistic. On the other hand getting everyone in the US to install insulating window shades is no more of a hurdle than getting folks to use energy efficient light bulbs. The shades are affordable, available across the country, and relatively easy to install.

"I am a huge believer in using nature whenever possible to heat and cool a home. Venting your space to cool during the night in summer or allowing passive solar to heat in winter is critical to maximizing efficiency." Says Clements, "In fact, older window stock may turn from a weakness to an advantage in exploiting the passive solar. So you harvest all that great heat during the day and then lower the shades which will keep that heat from hitting the cold glass, and also cut off the convection current – the draft which carries the cold from the glass across the floor, chilling the room."

EcoSmart shades use a double cell "honeycomb" fabric that is made out of bonded polyester which provides the highest insulating value. The bonded double honeycomb creates a barrier between the room and the window which means your heater and air conditioners don't have to work as hard. The fabric is available in a variety of colors and there are many operating methods to fit any need – including motorization for hard to reach windows or for the handicapped.

"Saving energy is important, but it is impractical to expect a homeowner to forfeit style to do so." Says Kelly Conklin, manager of the EcoSmart product line "Of course I am biased, but I just think it is so awesome that we have a product that saves energy every single day and looks absolutely fabulous at the same time!"

Government Builds Zero Energy Facility

by Roger Lohr

According to the Department of Energy and an article on the NY Times Green Blog, construction of the nation's largest zero-energy office building has been completed. The Department of Energy's National Renewable Energy Laboratory in Golden, CO is 222,000sf & more than 800 employees will occupy the facility in late August when it is due to officially open.

A zero-energy building creates as much energy as it uses. The new building cost is $259/sf and it is generally accepted that such construction costs 50% more than the cost of an average (energy inefficient) building. Imagine if it was ordained that all government facilities were required to be zero-energy buildings. Imagine if all government vehicles were electric. These concepts may not be that far-fetched as a government method to lead the way to a more sustainable world.

So what makes a zero-energy building? Start with extensive efficiency so that the building consumes less than half the energy of a building that is constructed to current commercial codes. And then generate power onsite with solar panels.

Passive and existing design techniques are a significant aspect to cutting energy needs. An east-west building orientation and a narrow 60' width bring more daylight into work space in the offices. Energy costs for lighting a typical building run about 30% of the electricity. Operable windows are key and one of the building's "smart" features will notify employees in a message sent to their computers when they should open or close their windows based on temperatures.

The walls are concrete sandwich panels (layer of insulation between layers of interior and exterior concrete) to absorb heat during the day to keep the interior cool and release the heat at night when the indoor temperatures drop. Low energy radiant heating uses water pipes circulate hot or cold water in concrete floor slabs to heat or cool the building. Corrugated metal panels cover the building's south exterior to capture and send solar heat to a concrete thermal labyrinth in the building's foundation. This stored heat feature can be used when additional heating is needed in the winter. Recycled materials were used in building construction such as reclaimed steel natural gas pipes for structural columns and wood recovered from CO pine trees that were destroyed by a bark beetle.

As time passes, we will see if the building operates as projected. The DOE plans to share information about the building design through a published manual at the Energy Laboratory's Web site later this yr. ♻

Homebuyers with a New Home Under Construction are Rewarded for Using Spray Foam Insulation

Lower energy bills, the elimination of mold, a stronger "shell," and a federal tax credit are just a few of the benefits of spray foam insulation

RUTLAND, VT (July 12, 2010) – As the Obama Administration continues to look at new ways to incorporate renewable energy into the daily lives of Americans, Americans, too, are taking charge and finding new ways to save on energy costs in order to create a healthy and sustainable living environment. According to a 2005 National Institute of Science and Technology (NIST) study, energy savings of up to 62% can be realized by undertaking specific air-leakage prevention measures in homes and buildings. New forms of insulation, like closed-cell spray foam, stop air and moisture intrusion, cut energy bills, strengthen the structure of the home or building, and protect inside air from mold, ultimately creating a healthy building.

The use of spray foam qualifies home buyers to receive the government's energy efficiency federal tax credit of up to 10% of the costs of qualified energy efficiency improvements as well.

"We're finding that more and more new homeowners are choosing spray foam as their choice for insulation because of the benefits associated with it," said Chris Smith, owner of Vermont Spray Foam, a division of Smith Building Company. "Traditional fiberglass insulation still has a 1-2% margin of error at the end of the fiberglass batt when installed. Air leakage through walls and floors can actually account for up to 40% of a homeowners heating and cooling costs annually.

But spray foam eliminates those leaks, sealing every hole, crack and seam and is being used in roofs, basements and large open spaces. For home buyers building a new home, spray foam makes economical and environmental sense."

The Department of Energy has reported that heating and cooling account for about 56% of the energy used in a typical American home. Closed-cell spray foam insulation reduces energy consumption plus minimizes noise and creates a better indoor air quality by eliminating the potential mold problems that can occur with traditional insulation.

Spray foam provides stability to walls and resistance to wind as well, protecting new homes from harsh winter weather elements like heavy, wet snow, strong winds, and torrential rain. Strengthening a new building's "shell" by as much as 300%, spray foam insulation does not shrink, sag, settle, or biodegrade.

"Whether building a new home or a new building for a business, buyers are searching for ways to make their buildings more sustainable," said Smith. "Closed-cell spray foam provides a solution for new commercial and residential buildings."

To learn more about closed-cell spray foam insulation and its many uses, contact Chris Smith at 800.689.9952 or email: smithbuilding@comcast.net. More information about spray foam benefits can also be found at HYPERLINK "http://www.vermontsprayfoam.net" www.vermontsprayfoam.net. ♻

FINANCIAL ☀ INCENTIVES

The 30% federal income tax credit has been extended to 2016. Together these incentives can reduce the cost of your system by up to 50%.

New Hampshire Performance with Energy Star Program

NH Performance with Energy Star is a program of Public Service of NH. If eligible a PSNH customer could pay $100 for a home audit. That money would be refunded by implementing any of the recommendations made by the auditor.

The customer could receive 70% of the cost of the improvements up to $4000. This means that the home owner could spend more than $5000 before receiving the maximum rebate.

Eligibility is determined by calculating the s.f. of the home & obtaining two yrs of utility bills. The Home Heating Index is determined by the ratio of 2yrs of utility bills in ratio with the s.f. of the home. Customers of Public Service of NH living in their own home or an existing 1-4 unit apartment are eligible to apply.

Locate 2yrs of Utility bills. Go to the PSNH website or call 1 800-662-7764 to determine eligibility.

Homes with high HHI ratings will be eligible. All info documented.

The program has a waiting list so plan ahead if you want to take advantage of this opportunity.

http://www.psnh.com/Residential/Efficiency/Residential_Retrofit.asp#eligible

FINANCIAL INCENTIVES FOR HOME ENERGY AUDITS & WEATHERIZATION

Vermonters can find a statewide list of Building Performance Institute (BPI) certified contractors to conduct audits and retrofits through the Home Performance with ENERGY STAR (HPwES) program, as well as a description of the program and up to $2,500 in financial incentives it offers, at www.efficiencyvermont.com/homeperformance/ or call 888-921-5990.

Upper Valley - Home Weatherization Challenge

Frustration and anger abound over the Gulf oil spill and the damage it is doing. As fossil fuels become more scarce and difficult to extract, companies will continue cutting corners to lower expenses and increase profits, at the environment's peril.

While BP must be held accountable and pay for the cleanup, all of us, to the degree we use oil and petroleum by-products like gasoline and propane, share some responsibility for this catastrophe. We must use the spill as a catalyst to change things in our own lives and to promote policy change to prevent similar future disasters and limit the threats of climate change.

The single most cost-effective measure most folks in the northeast can take to reduce our use of oil and propane is to have a home energy audit and install weatherization measures that can reduce fuel use by 30% to 70% or more.

In order to help encourage homeowners to take this step, SERG and our other Upper Valley Home Energy Assistance Team (UV-HEAT) partners, COVER and the Upper Valley Housing Coalition, are launching the Upper Valley Home Weatherization Challenge. We will be working with town energy committees in the Upper Valley to promote and expand home weatherization with the goal of doubling, tripling and quadrupling the number of completed jobs over the next 3 years.

This October, we will host a Home Weatherization Challenge Fair with representatives from weatherization companies, info on financing weatherization measures, product installation displays & incentives for getting your home weatherized – time and place to be determined. If you are interested in getting involved or for information, please contact Bob Walker, SERG@valley.net or 802-785-4126. ♻

Tax Rebates/Incentives

Some other incentive programs that you may qualify for (other incentive programs may apply, too):

The Vermont Small Scale Renewable Energy Incentive Program The VT state incentive for grid-tie solar projects is $1.50 per rated watt for businesses and homeowners, of installed PV power, up to 10kW. *Customers may apply for more than one renewable system, whether installed at the same time of over multiple installations.* Residential customers have a lifetime maximum customer incentive amount of $25,000 and Commercial customers have a 2yr maximum incentive amount of $110,000. Reservations for the solar electric Incentives are filling up fast. Once they reach a certain reserved kW, the incentive amount will be reduced. There has never been a better time for solar!

SOLAR HOT WATER VT's rebates for residential & commercial solar domestic hot water (SDHW) systems are currently set at $1.50 per 100 Btu of rated solar thermal collector capacity. The federal government offers an income tax credit for 30% of the system cost to both homeowners and businesses.

MICRO-HYDRO $3.50 per 3ft-gal/min drop.

WIND Production-based incentive: $6000 for the first 2kW plus: $1.60/W. *For more info: www.rerc-vt.org/incentives/index.htm.*

USDA Rural Development Program
The USDA Rural Development Program is for a broad range of projects in rural areas *(not restricted to agricultural businesses).*City Center 3rd Floor, 89 Main St. Montpelier, VT 05602 (802) 828-6000; email: susan.hayes@vt.usda.gov.

The Clean Energy Development Fund (CEDF)VT Dept of Public Service,112 State St., Montpelier, VT 05620. (802) 828-4039 email: kelly.launder@state.vt.us

New England Grassroots Environmental Fund
P.O. Box 1057, Montpelier, VT 05601 (802)223-4622 *info@grassrootsfund.org*

http://www.dsireusa.org/incentives
Database of State Incentives for Renewables & Efficiency

New Generation Energy - Community Solar Lending Program The low interest loans are available to companies (including sole-proprietorship) and non-profits in New England (CT, ME, MA, NH, RI, & VT), low & middle-income communities. 101 Merrimac St.,Boston, MA 02114. (617)624-3688;clp@newgeneration-energy.org•www.newgenerationenergy.org

Property-Assessed Clean Energy (PACE)
Financing for property owners to borrow money for energy improvements. The amount is typically repaid via a special assessment on the property over a period of up to 20 yrs. Solar water and space heating, photovoltaics (PV), biomass energy heating systems, small wind systems, micro-hydro systems and also include efficiency measures that reduce the net energy requirements of the building: insulation, window replacements/renovations, energy efficiency heating systems…
Information: http://www.veic.org/ResourceLibrary/PACE.aspx.

REAP Grants range from $2500 to $500,000 or 25% of the total project.

REAP Feasibility Grants for feasibility studies, up to $50,000 or 24% of total cost.

REAP Loans range from $5,000 up to $25million or 75% of the total project cost.

Ask The Home Team Efficiency Vermont

Q: Which uses less energy - A dimmer switch with an incandescent bulb or a regular switch with a CFL?

I'm prepared to install dimmer switches if they're the better way to go.

A: You'll use less energy with a compact fluorescent light bulb (CFL) than with a dimmed incandescent light bulb.

I should point out that you don't have to dim your lights to save energy. CFLs are designed to deliver the same light output as incandescents but with as much as 75% less energy. CFLs also can last up to 10 times longer.

But if you actually want less light, then the easiest energy-saving solution is to use the lowest-wattage CFLs you can find and skip the dimmer altogether. But if you want to have the option of variable light levels, by all means install dimmer switches and use them with CFLs that are specifically designed to be dimmed. I hope this answers your question. *Thanks for writing in. - Bob for The Home Team*

Q: We've got a few major appliances that are getting ready to be replaced.

We calculate that we can afford to replace just one of them this summer. How do we figure out which one is using the most electricity?

A: I suggest that you use a plug-in meter, which measures the power use of nearly any electric device. They're easy to use. *Efficiency Vermont* loans them at no cost. *To request one, you can fill out a simple online form at our website below - just search for "meter loan".*

When you determine which appliance you'll replace, look for an ENERGY STAR® qualified model. The ENERGY STAR label indicates that a product exceeds minimum federal energy-efficiency standards.

Qualifying products of any brand can receive this label. Efficiency Vermont offers rebates for select ENERGY STAR products available in retail stores throughout the state. *For more information, visit the residential Rebate Center at www.efficiencyvermont.com.*

- Kathleen for the Home Team ♻

SIP Wall & Roof Systems

Editor's Note: *I received numerous questions in response to our recent article, SIPs Technology: An Energy Efficient Alternative to Stick Framing. Therefore I asked for an exclusive interview with Bo Foard, owner of Foard Panel and 20yrs of experience in manufacturing & installing SIPs.*

GET: ***Are there any off gassing concerns associated with SIPs?***

Bo: No. SIPs contain no urea-formaldehyde and do not off-gas on the job site. There is a very limited amount of off gassing that occurs in the manufacturing process. SIPs qualify for LEED points for low VOC emissions.

GET: ***Explain the difference between XPS and Urethane panels.***

Bo: In terms of chemistry, XPS is simply an extruded thermoplastic while Urethane reacts into a thermoset plastic as its extruded. Urethane, being a more complex foam to set, sometimes makes it difficult to ensure long term dimensional stability. Also, among core choices Urethane is the weakest. XPS is approximately twice as strong as Urethane.

In terms of thermal performance, XPS and Urethane are very comparable. XPS rates at R-5 per inch and Urethane at R-6.

GET: ***Are pests a problem? What ones? And how to handle them?***

Bo: As in any structure ants can be an issue. Any construction site will stir up an insect's ecosystem and encourage them to seek new homes.

We encourage our customers to take the same pest precautions they would take if building a stick frame home. Hire an extermination service or use natural methods to prevent pests.

Ants are not attracted to SIPs for food; rather they will burrow in the foam for shelter. Ants tend to live in places near water. Therefore, we have noticed that when a SIP home has insect issues, they also have a moisture issue. We encourage our customers to make building decisions that will prevent moisture issues and thus reduce the occurrence of pests.

GET: ***What is their longevity/life expectancy?***

Bo: The first SIP buildings constructed in the 1950's are still in use. I feel these buildings will last for forever if they are installed properly & if appropriate building science details are followed.

The most current building science recommendations for SIPs can be found at Foard Panel's web site HYPERLINK "http://www.foardpanel.com" www.foardpanel.com or you can purchase the complete Builders Guide to Structural Insulated Panels on the SIPA (structural insulated panel association) web site HYPERLINK "http://www.sips.org" www.sips.org

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Comparison per Million BTUs by VT Dept. of Public Service Jan. 2010

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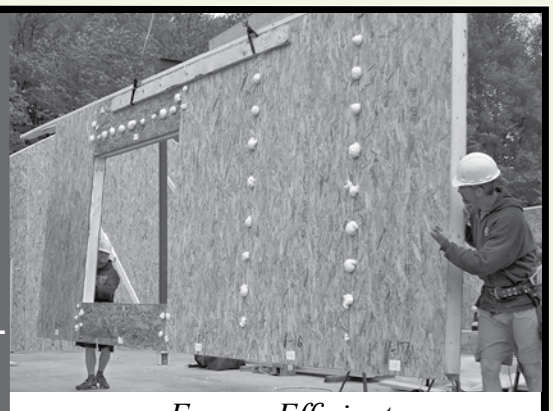

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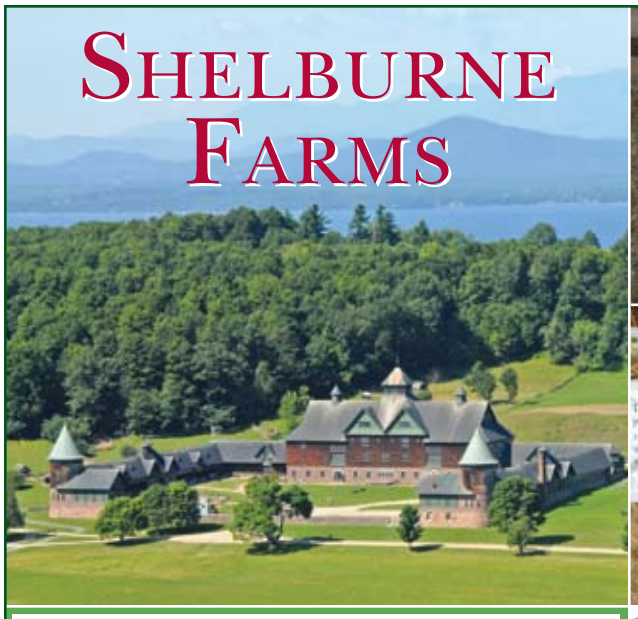

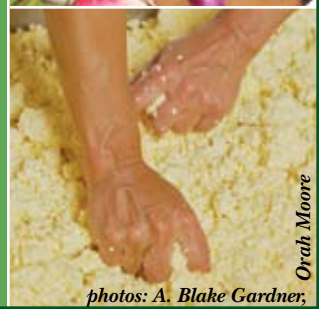

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How Sustainable is Your BUSINESS

Squeaky-Clean Conscience: Car Wash Offers Solar Alternative

Westminster Station – Have you ever thought about the hot water you use every time you clean your vehicle? One area car wash owner thinks you probably should think about it, and then seek alternatives.

According to Abenaque Car Wash owner Stanton Scott, a single drive-through wash uses 20 to 30 to gallons of water.

Those gallons add up quickly, especially over the winter, when the floor of each bay must be warmed as well. Scott said the car wash goes through 800,000 gallons of water per year, about half of which is heated.

Since last summer, though, that water is heated partly by the sun.

The solar thermal panels at Abenaque cover almost the entire roof, and this winter they allowed Scott to cut his propane use by more than a third during his most intensive water-usage period. That's good for the planet, he said, but it has also improved performance, as well as Abenaque's bottom line.

Switching to partial solar water heating "was the right thing to do," Scott said. He has also been impressed by the performance of his system. "The propane could not keep up with demand," he explained. "But we never run out of hot water now."

Still, the solar thermal system would not have been economically feasible without major incentives from the State as well as the federal government. In the long term, he said, the cost savings will be impressive. But "the short-term returns are not the best without the rebates," he explained. "The rebates really make it worth it."

According to Andy Cay, president of Integrated Solar Applications, which installed the Abenaque system, this year's incentives are an even better deal than last year's. Thanks to a boost from federal stimulus money, the State announced this month that it is offering unprecedented levels of assistance for both residential and commercial solar installations.

Vermont home owners can now receive up to $25,000 in rebates from the State, said Cay, while Vermont business owners can get up to $110,000, depending on the size of the system. These incentives apply to solar thermal (hot water), solar electricity (photovoltaic, or PV), wind and micro-hydroelectric projects.

Integrated Solar does all these types of installations, sometimes integrating them with biomass and geothermal systems to facilitate carbon-neutral space heating as well. The company is currently completing work on the largest residential photovoltaic system ever installed in Vermont, and expects the new incentive structure to boost interest throughout the state.

"You don't have to be a car wash to see major returns on your investment," Cay said. "Many of our customers over the years have been local homeowners. The incentive programs and cost savings work just as well for homes as they do for a business."

Founded in 1975, Integrated Solar has expertise in solar thermal, solar photovoltaic, small wind, geo-thermal, and biomass, as well as hybrid systems that combine these technologies. For more information, visit ISASolar.com, or call 802-257-7493 ♻.

Recent pic of rooftop solar in Israel. Both Solar Hot Water and PV are commonplace. Building Permits are not approved without Solar Hot Water included in the plans! Now isn't that the way it should be? ***We need change!***

Farm-Way Inc. - Getting Green

Many things influenced us in the decision to go solar . Be it from our customers that were pursuing or were involved in some aspect of green energy, to the expansion only a couple of years earlier of our retail store of approximately 70% increase, which resulted in much more energy consumption with the additional utilities encompassed {air handling ,heating, cooling and lighting}. These things along with our own growing concern of our environment led us to take the step towards dissolving a large portion of our impact at our community level.

We are extremely excited about this venture we have taken, and had begun construction of this system in mid October of 2008 , and had begun collecting power from our system by the beginning of January 2009.

Farm-Way and "Vermont Gear" {our retail web site}, with the help of the "Vermont Clean Energy Development Fund", have invested over $450,000 in our solar panel project from a company in White River Junction, Vermont. Grant money from the Vermont Clean energy fund helped get this project off the ground and was received in May of 2008.

It is constructed with 308 panels in a portion of our adjacent field, leaving room to expand the system in the future to perhaps compensate for 100% of our electrical utility needs. Payback is expected in approximately 10-15 years.

We are generating approximately 58 KW of power, which is equivalent to 43% of our electrical power consumption. {We have accumulated readings of 62% & 66% of our power being generated by our system in the months of April and May of this year}

Lifetime of our solar system data states we have produced 45% of our consumption.

Our utility usage is approx.$33,000 per year, and with our solar production, we expect to save approximately $14,000 annually towards this cost.

Environmentally, our system allows our local electrical service to avoid 76,000 pounds of carbon dioxide per year, equivalent to 11 passenger cars for a year or annually planting over 1500 tree seedlings and growing them for 10 years. This will also allow reductions from the utility power annually of NOX @ 84 pounds and sulfur dioxide @200 pounds.

To help raise awareness , and promote education, we now have a public video monitor at our entryway providing continually updated views of the systems output and easily understood information on the benefits of solar. We have also linked our web site to the data and output information in real time, as it happens as you can see on our web page. We are extremely excited about this endeavor , and even more so as we watch our compensation for utility power that is being generated with this pasture of power...

Our future plans are already in progress, by becoming more energy proficient with the help of " Efficiency Vermont", by upgrading to more energy efficient lighting in our main store and our adjacent" County Gifts and Furniture" store , entailing the replacement of over 75 fixtures using 60% less energy.

Anyone wishing , can join us at our store after hours on the second Thursday of every month from 6:30–7:30 p.m. for a Free Solar Education Seminar brought to you by Gro Solar of W.R.J., Vermont. This brings basic information to the average homeowner on the attributes of solar power.

We invite you to come learn about using clean solar energy for your home or business.

Another one of our latest ventures has been with installing 100 L.E.D replacements for flourescent lighting tubes in the store this spring ,from www.leddynamics.com {made in VT} LEDs are the first light source in history that do not require heat to generate light. This significant factor attributes to LEDs status as the most efficient light source known to mankind, next to the sun. LEDs are solid state light engines, requiring no filaments or glass, which makes them extremely rugged and shock resistant. ♻

- LEDs last up to 100,000 hours, at least 10x as long as most forms of conventional illumination.
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- LEDs can operate in harsh environments and withstand temperatures ranging from -40 c to +85 c.
- LEDs are extremely rugged and shock resistant, unlike filament bulbs.
- LEDs are environmentally friendly, and unlike Metal Halide, HPS/LPS, and Fluorescent bulbs, do not require mercury or toxic and flammable gases to operate.
- LEDs produce very little heat, allowing them greater versatility in applications for which conventional lighting simply will not work.

How Sustainable is Your BUSINESS

Development from the Heart ~ Leading by Example

June 15, 2010 By Melinda Moulton, CEO of Main Street Landing

Today, mainstream American knows why working in a healthy green building is better for us, and everyone realizes that energy efficiency is important. We all know that recycling and utilizing recycled products is the right thing to do, and we all know that indoor air quality needs to be excellent for human health.

Main Street Landing began thinking about these things thirty years ago back in the early 1980's when Lisa Steele and I began visioning a redevelopment for the Burlington Waterfront. We needed to bring our sixties values of environmentalism and social justice into our work. At the time there were not many people doing green development but we put together a team with Blair Hamilton, Bill Maclay, and John Quinney, and we set out to develop strict green principles for design and construction. This was before the Green Building Council had LEED Certification (Leadership in Energy and Environmental Design). We were in many ways pioneers in the green built environment movement putting our money where our "hearts" were.

Most people spend 90% of their time indoors, and up to 30% of new or remodeled commercial buildings may have unusually high rates of health and comfort complaints. Healthy spaces mean less sick days and higher productivity. There are several documented studies that show improved lighting, thermal comfort, and air quality increases worker productivity by up to 16%. Green buildings consume less energy and water resulting in lower operating costs to the owner and the tenants. The economic costs in annual U. S. dollars from unhealthy buildings is 180 million lost workdays, 120 million additional days of restricted activity, $36 billion ($140 per person) in health care costs, totaling about $70 billion dollars a year.

You can see why green building has become more and more popular and why developers are realizing that there are tremendous advantages to building green.

Oftentimes in the sustainability discussion the issue of social justice does not get included. Main Street Landing believes that it is important to focus on creating a place that not only is healthy and energy efficient, but also supports human well-being. Sustainability means that the decisions and choices made today should not limit the choices and opportunities of future generations, and we should include ecological integrity, economic security, empowerment and responsibility, and social well-being in the sustainability picture.

Main Street Landing created a vision for our work that included a focus on "what responsible development needs to be". Our projects support and strengthen our neighborhoods and are concentrated within the city's growth center. We create mixed-use structures for housing, office, and retail. We try to lessen the dependence on the automobile by contributing to and supporting public transportation. We show respect for the City's history and natural systems and support long-term, solutions to growth. We endeavor to nurture working partnerships with citizens and governmental agencies. Our motto is to "create a place for all people" which is a place where anyone and everyone can feel a special connection.

We support the arts and cultural fabric of a community with four art galleries and a performing arts center. Our buildings have incubator spaces in which to grow local businesses. We have developed and enforced strong environmental guidelines for construction and tenant fit–ups, and our buildings demonstrate a model of highly efficient energy use.

We always choose materials that maximize recycling and minimize environmental impacts. Our buildings have excellent indoor air quality and a low carbon footprint. Building green and caring for one's community in the process does not cost any more than traditional development.

The Chittenden County vacancy rates are about 12%, and Main Street Landing is experiencing about a 4% vacancy rate. People want to be at Main Street Landing for a variety of reasons, but I like to think it's because we endeavor to create an environment that makes people feel good in their bodies, their minds, their hearts, and their souls.

Learn more about Main Street Landing at http://www.mainstreetlanding.com. ♻

Maclay Architects Achieving Net-Zero Energy

The Maclay Architect office is now net-zero, producing as much energy as it consumes on an annual basis. This achievement is the culmination of a long envisioned process for the Waitsfield firm which offers net-zero and high-performance building solutions to all of their clients.

Projects designed by Maclay Architects exemplify the goals of high-performance buildings. Recent examples include the two near net-zero NRG Systems buildings in Hinesburg, the net-zero Putney School Field House and the micro-load renovation to the George D. Aiken Center on the UVM campus. To demonstrate to their clients that this is possible for all buildings, even a renovated historic carriage barn, it was important to Maclay Architects to make achieve this goal in their own offices.

The project started with deep energy renovations beginning in the early 1990s when Bill Maclay purchased the historic building. Over several years, Maclay Architects upgraded the insulation in their offices from well below code to R-60+ for the roof, R-40+ walls, and R-5, triple-glazed windows. The project continued with the installation of a 2 kW photovoltaic tracker system in 2005 which produced a small portion of the office's electric needs. In 2009 the connected building which houses two apartments was completely retrofitted with new windows and insulation to meet the same high energy standards.

In order to preserve the historic exterior of the buildings, insulation upgrades were performed on the interior, which de-creased square footage slightly but left the facades untouched. Daylighting was optimized in both buildings to reduce the need for electric lighting. Though the apartment building retained the look and placement of many of the historic windows, the offices were opened up to provide more natural interior lighting and a healthier work environment. An air source heat pump providing both heating and cooling replaced the existing mechanical systems allowing for efficient heating and cooling. This also means that all energy use in the two buildings is electric and able to be provided by the photovoltaic systems. Efficient appliances and lighting as well as healthy materials were used in both buildings.

In June 2010 a 17.55 kW photovoltaic array was installed in the form of a carport, completing the decade long process of bringing the offices to net-zero. The PV panels for the system were provided by Alteris renewables and made possible through grants from USDA Rural Development and Green Mountain Power. The offices are now fully transformed to the first net-zero architecture office in Vermont.

The process to achieve this accomplishment began with a clear vision of the end goal. From the beginning, Bill Maclay recognized that there was a need to make sure all renovations were in alignment with the net-zero goal. ♻

< Cont'd from front cover - ## National Life

our water consumption by 16 percent.

Solar power came in 2008: A rooftop array of 418 photo voltaic panels converts sun energy into electricity. The 73kW PV system was made possible thanks to a combination of a state grant, federal and state tax credits, and a solar incentive program offered by Green Mountain power. Twenty solar thermal panels provide domestic hot water.

This summer we are installing a $2 million biomass boiler heating system, which will provide more than 90 percent of the heat for the campus. The system will cut our annual use of heating oil from 210,000 gallons to 30,000 gallons and will cut the company's annual carbon footprint by 45 percent.

Taken together all of these initiatives, and many others, brought LEED certification from the U.S. Green Building Council, one of the largest and oldest commercial office buildings in the country to win the designation.

We offer incentives to employees who carpool, take public transportation, walk, bike or work at home. This summer we have a company garden where we are growing vegetables for employees and for use in our cafeteria.

How did it happen? One step at a time. But each step make sense economically. And most importantly it has been the right thing to do.

We invite businesses to come look over what we have done – we'll open our books and show you how much it has cost – and tell you when we expect to be paid back for the investment.

Our hope is that others will see that all of these investments make sense – even in a 50-year-old building. ♻

NRG Systems goes Net-Zero

By Lauren Bowie, Corporate Communications Intern & Abby White,, Corporate Communications Specialist - NRG Systems

When Jan and David Blittersdorf completed construction on their first green building in 2004 the goal was to design a sustainable building where people could live and work in harmony with Vermont's natural environment. They wanted to build the highest performing environmental building – one that takes advantage of the latest technologies, as well as one that provides a productive and pleasant place to work. Six years later, they are the owners of two green buildings and operate the first net-zero manufacturing site in Vermont, and perhaps the nation.

Photo Credits: Carolyn Bates

NRG Systems is a manufacturer of wind measurement equipment for the global wind energy industry. Founded in 1982, the company serves electric utilities, wind farm developers, turbine manufacturers, research institutes, government agencies and universities – anyone who measures the wind. The company's wind measurement systems and turbine control sensors can be found on every continent in more than 140 countries.

Environmental stewardship is core to the company's products, its practices and its mission. The green campus embodies NRG Systems' commitment to the health of its employees as well as the planet.

Photo Credits: Andy Duback

The first building, 110 Riggs Road, is 46,000 square feet, while the second building, 60 Riggs Road, is about two-thirds the size and includes technological advances in sustainable design. Both buildings are LEED gold-certified and maximize conservation and energy efficiency. Super-insulated building envelopes, high-efficiency fluorescent lighting, Energy Star appliances, triple-glazed windows, and natural daylight enable the buildings to consume one-fifth the electricity of typical buildings their size.

Photo Credits: Andy Duback

A fresh-air exchanger, natural ventilation, operable windows and low- or no-VOC emitting stains, paints, adhesives and sealants ensure excellent indoor air quality for employees. Both buildings are served by radiant heating and cooling systems that in the winter months are heated by wood pellet boilers and in the summer months cooled by a geothermal system and cooling pumps. Nine solar hot water collectors provide for 70% of the facilities' hot water needs.

After driving down energy consumption, the owners looked to meet the building's remaining energy needs with renewables. The two buildings feature 80 kilowatts of roof/building mounted solar photovoltaic (PV) panels and 62 kilowatts of solar PV trackers. With the recent addition of a 140 kilowatt solar tracker farm adjacent to NRG Systems' property, the company expects to produce all of its electricity with onsite renewables in 2010 – making it the first net-zero manufacturing site in Vermont.

Photo Credits: Andy Duback

Together, the NRG Systems buildings prevent almost 210,000 pounds of carbon dioxide annually from entering the atmosphere and save more than 100,000 gallons of water per year. The buildings also provide a healthy haven and rewarding place to work, as evidenced by NRG Systems ranking among the Best Places to Work in Vermont for five years in a row. By many measures NRG Systems demonstrates what it means to be a sustainable business. ♻

NRG systems

The Energy Efficient Conservation Center

by Joyce El Kouarti

The Society for the Protection of New Hampshire Forests built the Conservation Center in Concord, NH to demonstrate the use of renewable natural resources and energy conservation techniques in construction. Created in three phases spanning the early 1980s to 2001, the Main Building, the Weeks Wing, and the French Wing all incorporate the energy-conservation measures available at the time.

The entire facility is constructed of wood from New England forests, including eastern red spruce, oak, cherry, and white pine. Using regionally grown woods helps local economies and keeps jobs in NH and New England.

Vertical windows covering 1,500sf on the south side of the Main Building allow the sun to passively heat and light the space. The black slate floor absorbs heat during the day and releases it at night. The windows are positioned vertically, so during the summer, when the sun is high in the sky, its rays do not enter directly and overheat the building. Sugar maple and red oak trees provide shade in summer and allow sunlight in during winter.

Photovoltaic solar panels on the south roof convert the sun's energy directly into usable electricity. The wood pellet stove in the Main Building and our wood gasifier provide heat for all of the buildings at the Conservation Center. The gasifier burns wood chips left over from milling operations to heat water, which is pumped to baseboard heat distribution units. This approach helps keep the energy bill low; the cost of heating the building is approximately half of what it would be with conventional home heating oil.

A significant portion of the award-winning, LEED Gold-certified French Wing was constructed from recycled materials. The atrium floor tiles are made from recycled glass, and the handicap ramp outside is made of composite lumber from recycled soda bottles and sawdust. The foundation blocks are a combination of cement and woodchips from construction debris.

Completed in 2001, the building was designed to use 80% less water than a conventional office building of similar size. The atrium is filled with plants that are fed filtered greywater from the shower, sinks, the water fountain, and the dishwasher. The two foam Clivus flush toilets upstairs each use about two ounces of water per flush. *Most modern-day toilets use over fifty times more water than these toilets.*

The skylights on the north side and windows on the south side fill the building with daylight, helping to lower lighting costs. In the summer, a fan in the cupola exhausts heat at night, cooling the building. Small windows above each office door are left open to allow warm air to escape even with the doors closed. This system allows the building to remain at a comfortable temperature without the use of air conditioning. The French Wing uses 60% less electricity than a similarly sized building.

Home to ten other NH conservation organizations in addition to the Forest Society, the Conservation Center uses renewable resources and energy-efficient design to reduce the use of non-renewable fossil fuels and minimizes both air and water pollution.

The Forest Society is the oldest, statewide land conservation organization in NH. Since 1901, the Society for the Protection of NH Forests has worked to establish permanent conservation areas and promote sustainable forest management. For more information, visit HYPERLINK "http://www.forestsociety.org" www.forestsociety.org. ♻

SOLMATE SOCKS IS SOLAR!

by Diedre Gish

Solmate Socks, Inc. is pleased to announce the completed installation of a 5.52 kW solar photovoltaic system on their offices in Strafford, VT. The system will provide an average of 80% of the electrical usage in the office, or nearly 700 kW hours per month.

As part of the corporate environmental responsibility policies of Solmate Socks, the pv system is the latest and most visible effort toward sustainable business practices. Since its founding 10 years ago, Solmate Socks are proudly American made using 100% recycled cotton. Recently, the composition of the product has improved to include recycled nylon and lycra, creating a 100% recycled product made in the U.S.A. Catalogs are printed using FSC certified paper, product tags are made from post-consumer paper and all office paper is 100% post consumer recycled. Zero waste initiatives have led to recycling of all office paper and cardboard, composting of kitchen waste and innovative ways to recycle all of the waste materials of the production process.

Socks not suitable for retail sale are used to make unique handmade hats. Scraps from the hat making process are sent to an independent artist and woven into beautiful handmade throw rugs and placemats. Sock seconds that cannot be used to create hats are routinely donated to charitable causes.

Working closely with the family-run knitting and yarn manufacturing facilities, Solmate Socks has also encouraged the recycling, waste reduction and energy conservation efforts of our suppliers and is even looking for ways to up-cycle the lint waste of production.

Installation of the PV system was completed by ReKnew Energy systems. Please visit www.socklady.com, www.reknew.net for more information. ♻

GMP-Shelburne Farms
Solar Project Moves Ahead

COLCHESTER, VT …. Green Mountain Power and Shelburne Farms are working together to build solar generation at Shelburne Farms. Under the terms of a 25-yr cooperative agreement, GMP will install a 770 solar panel array at Shelburne Farms. The panels will occupy 3/4 acre in a field that Shelburne Farms has recently designated as a "Solar Orchard."

Mary Powell, GMP President and CEO, said, "This project is an important part of our overall energy and climate strategy to increase the amount of renewable energy generation in our state. It brings us very close to our goal to have 10,000 solar panels installed in our service territory within 1,000 days – a commitment we made in November 2008."

The project location was carefully chosen by Shelburne Farms and GMP to maintain the historic and scenic integrity of Shelburne Farms, which has been named a National Historic Landmark.

Alec Webb, President of Shelburne Farms, said, "This partnership with GMP fits our mission to cultivate a conservation ethic in the students, educators and families who come here to learn. Production of clean renewable energy in the Solar Orchard is an opportunity to demonstrate stewardship of natural and agricultural resources." A kiosk on a nearby walking path will provide visitors with information about the project.

According to Mr. Webb, the partnership with GMP is a significant step toward creating the infrastructure that will help Shelburne Farms achieve its goal to produce all its own electricity on site, allowing the Farm to participate in net metering. Net metering allows electric utility customers to generate electricity for personal use using renewable resources. They pay their utility regular monthly service charges, but are billed for electricity only when they consume more power than they generate.

Shelburne Farms, as well as all GMP customers, have an added incentive to produce their own solar electricity. GMP is the only VT utility in the state that pays its customers for the solar power they produce under its SolarGMP program, which is available to net metered customers with systems under 250 kWts. As a result, GMP has seen a 3-fold increase in the number of customers installing solar generators in the past 18 mos. "Customer-owned solar is a cost effective way of helping to meet electric energy needs when power use is high on hot sunny days," said Ms. Powell. "The amount of electricity generated from solar is that much less power that has to be purchased from the New England market, which is dirtier and higher in carbon."

The Shelburne Farms solar orchard is expected to be up & producing clean renewable energy in Sept. For further info, please contact Dorothy Schnure, GMP Manager of Corporate Communications, at 802-655-8418 or Rosalyn Graham, Director of Community Relations, Shelburne Farms, 802-985-8686, x328. ♻

Green Mountain Biomass Facility Moves College to Carbon Neutrality

By Kevin Coburn 7/15/10

ON EARTH DAY, 4.22.10, Green Mountain College took a giant step towards its goal of carbon neutrality when a new combined heat & power biomass plant was ignited for the first time.

Instead of burning number six fuel oil, the plant will burn woodchips, providing 85% of the school's heat & generating 20% of its electricity. Fuel oil will be used mainly as a backup to heat campus buildings. The College will burn about 4400 tons of locally harvested woodchips each yr.

Only a handful of colleges across the country have claimed complete carbon neutrality, largely though purchasing of carbon credits. Next year, Green Mountain College will be the first higher education institution in the nation to be carbon neutral by cutting emissions by 50%.

In the new plant, woodchips are fed into a boiler & heated at a high temperature with low oxygen, until the fuel smolders & emits gas. On the back side of boiler, oxygen is added & the gas ignites: the resulting steam is circulated through existing pipes for heat & hot water. The steam also activates a turbine which will produce 400,000 kWh of electricity. The college estimates that the $5.7 million plant will pay for itself over eighteen years through savings on fuel costs.

Student activism was a key ingredient in convincing the administration to make the move to renewable energy. In 2005, a freshman honors seminar produced a proposal to study the feasibility of a new biomass plant & their proposal was accepted by the Student Campus Greening Fund. When President Paul Fonteyn assumed his duties as in July 2008, the biomass proposal was on his desk & he made it one of his first priorities.

"The whole campus community sees this as a key part of our plan to make the campus a model of sustainability for other colleges & the surrounding community," said the College's sustainability coordinator Amber Garrard. "It reduces our ecological footprint while saving us money & creating local jobs." ♻

Wirebelt of America Goes Solar!
99.3 kw Solar PV Array is Largest in NH

Interview July 6, 2010 by Nancy Rae Mallery

David Greer, CEO of Wire Belt Company of America is passionate about renewable energy! In a recent interview with David he explained how he feels it is a "way to help our country's economic situation. To invest in solar and renewable energy makes total sense. As the electric rates continue to go up and up, the better we'll be ...plus I LOVE the stuff!"

By far one of the projects WBCA is most proud of is the 99.3 kWt Solar PV installation. This system produces approx. 25% of their load, producing 109,000kwh annually, reducing Co_2 emissions by 168,600 pounds annually - an annual savings of $14,000.

"This solar array is just one part of our focus on being a 'green' company. It is our goal to cut our ecological footprint by 50% in 3 years," said CEO David Greer. "This means cutting our waste stream and use of electricity, gas, and water usage in half." *Mr. Greer told Green Energy Times that he is not through and plans to cover his whole roof with Solar Panels!*

All domestic hot water is heated by two solar collector systems.

Wirebelt of America is a 4th generation business, which allows him more flexibility when it comes to implementing green initiatives. including the new 99.3 W PV array that is up and operating. Other energy reduction measures includes replacing equipment with more efficient ones, and monitoring even what may seem insignificant, like dropping the psi on the air pressure needed to run equipment. David said that just 1 psi saves a lot in the long run - that they keep lowering it until someone cries 'uncle' in the shop.

Although they have replaced 276 - T12 light fixtures with T8 lamps and ballasts plant wide, occupancy switching installed, and all incandescent and hps lighting has been replaced with LED or CFL lighting, the CEO says "the cheapest thing is to not use them". This measure contributes to 9300 pounds of Co_2 reduction per year.

The data center has eliminated 7 servers, realizing a 216,000# reduction of Co_2 emissions.

Their environmental programs include, but are not limited to the reduction, reuse, and recycling of raw material. Since inception, they have recorded an annual reduction in solid waste of 191,000 pounds, a reduction of 237,361 pounds of raw material - a total savings of $663,908. The recycling program also includes raw material consumption and waste, & incorporate programs for their steel wire scrap reduction.

A Sustainable Landscaping project will eliminate the need for mowing and maintenance. One side of the building's lawn has been transformed into gardening space for the workers. They can pick fresh vegetables for dinner. - an example of how consideration for employees might be one reason they have been voted "Best place to work n NH for 3 yrs in a row".

Wire Belt 'Green' Initiatives programs have collectively reduced kWt consumption by 34%. Most projects are based on kWt and Co_2 reduction. *Actual savings of 838,840kwh, $73,314, and a reduction of 1,539,161 pounds of Co_2 emissions year end 2009 collectively.*

The new PV system was installed by Nexamp of North Andover, MA. As Nexamp's CEO states: "We encourage other companies to follow Wire Belt's example and explore the economic and environmental benefits of clean energy solutions like solar energy, geothermal, and high-efficiency lighting."

Green Energy Times encourages your business, small and large to folow this wonderful example from Wire Belt Company of America! ♻

USA Solar Store

A profile in Sustainable business

by Julia L. Wright

The Weathersfield Business Center has been home to us since 2004 - "walking distance" to our off grid home. We have had the strong desire for a grid tie PV system, since we moved in. The landlord, Scott Bradley was interested finally when the incentive levels got to nearly 50%! He was, however concerned about the reliability and the up front cost. I needed to make the deal irresistible. I had a large Xantrex power center, a double inverter stacked up capable of battery back-up and grid tie. I threw that in for cost. Still not sweet enough.

The building was in a commercial area with a few successful mature businesses surrounding it, but for some reason, this particular grid connection suffered more than its share of brown & blackouts. Scott runs an environmental laboratory - his test cultures need a stable electric supply and If snow & rain and heat and hail, etc. won't keep the mail from moving? Why suffer the closing of the P. O, due to power outages? Cate, the Post Master agreed!

While we were getting ready to quote the final installation price, I received a call from Matt Lash of the IBEW Local 300 wanting to know if there was an opportunity to work with USA Solar Store! They wanted to work with our stores-not just in VT, and agreed to work with us just for the experience. Our guys would also learn a thing or two working with them.

This kind of collaboration strategy is what our USA Solar Store group is famous for. There is plenty of Solar work to do. The first test project was the USA Solar Store HQ here in our rented office.

It is now complete, just needing a final inspection to fully activate all systems.

The bottom line is that USA Solar Store HQ is now "walking it's talk", the laboratory of the landlord is ready for the next power failure, and the P.O. is still going to be working thru the next outage. In addition, the IBEW and our guys formed friendly relations, and we are ready to carry this successful collaboration across the Country.

USA Solar Headquarters, Weathers field P.O and a Lab are Grid-tied with Solar

Wood Pellets save CO_2 and $ for Pellergy!

Here at Pellergy LLC we are heating our entire assembly area & 3500sf of office space with wood pellets. Furthermore, we've con-verted the heating in the adjacent 14,000 sq-ft warehouse to wood pellets.The warehouse system alone hit 130 gal. of fuel oil/week in winter to keep the space around 45º F. Now we are using renewable wood pellets that are made right here at VT Wood Pellet Company in Clarendon, VT.

We maintained 55-60º in the warehouse during the winter mos., after converting the system in early January. We figure we used ~ 23 T of pellets in the warehouse and 8 T of pellets in the Office Assembly from January on. This is~ 3,565 gal. of oil, total. Based on our commercial rates for oil and our bulk rate for wood pellets we ended up with a 19.7% cost savings switching to wood pellets; not to mention saving about 40 T of carbon emissions.

We are pressuring the landlord to make building improvements which would include some efficiency upgrades; however, to date, this has not happened. Our personal efforts have been in tightening the envelop with foam and other sealing methods. The building is not an example of an efficiency upgrade by any stretch. ♻

Socially Responsible Financial Advisory Goes Green

by Todd Walker 7-2010

An old barn on our property morphed into a solar platform - even though it meant we had to 'turn' it to face in the right direction for solar! The roof angle was not very steep, but it was definitely a good for summer mode - one of the best times for solar gain. I always wanted a greenhouse, so began the concept of a combination greenhouse/entryway for the office - "Four Seasons" type greenhouse/entry of all glass for maximum gain. But that much glass would create a kiln in the summer. With an office I only need to heat it to 70° or so during the day. At night, it just needs to stay above freezing. So Robin Chestnut Tangerman, my builder from Middletown Springs, VT, advocated an entranceway using a large expanse of vertical thermal panes, with a roof overhang to limit the summer sun.

The fun part: I decided to go grid-tied in order to get the state incentive payment, and I like the idea of feeding electricity to the community. For the system, I turned to Dave Bonta of USA Solar Store because of his experience and pure enthusiasm!

The barn roof fit fourteen 190-watt panels for peak production of 2600 watts - which was all we could afford. We used a Sunny Boy model 4000 inverter which was more than we needed but the excess capacity allows for greater efficiency and possible expansion. Central Vermont Public Service made connecting to the grid easy and even provided the special meter required at no charge.

So what have been the results? The system's worked well and saves about one third of our office/home electric bill. The Sunny Boy tells us we also saved 77,000 pounds of CO2 since the system went live in fall 2008 - not bad.

We specialize in socially responsible investing, so for us there were additional reasons to go solar beyond cost savings. We wanted to "walk our talk" both personally and professionally

The main lesson from our exercise is that recycling old structures for solar is very attractive economically for a business because - on top of construction and energy savings - we also can depreciate the renovated structure. Before you build new, look around your place -- or even scout the neighborhood – for old buildings you could buy and move. With people strapped for cash these days you might be surprised how cheaply you could buy a perfectly sound, hand-crafted building, and bring it home.

Todd Walker is a Financial Advisor Representative offering securities through Financial West Group, Member FINRA/ SIPC. He can be reached at 802-325-2200, HYPERLINK "mailto:twalker@fwg.com" ~~twalker@fwg.com~~ or HYPERLINK "http://www.PAMVermont.com" ~~www.PAMVermont.com~~. The PAM Network is the socially responsible investment division of FWG. Office of Supervisory Jurisdiction: 167 Exeter Road, Newfields, NH 03856. ♻

How Sustainable is YOUR business?

By Julie Lyford

RSD Transportation Inc. of WRJ, VT, a lo-cal family owned trucking, leasing & commercial warehouse location, has been in business for over 40-yrs. Over this time we have been very aware of the high costs that can be associated with energy. From the gas & diesel crunch of the 70's to the more recent rising cost of electricity that has encumbered companies across the country. Energy in general has undoubtedly become more of a focus on how we overall run our company.

A few yrs ago, with the competitive nature of transportation, RSD felt it very important to try to minimize monthly energy costs. In 2007, through Energy Efficient VT we installed an energy efficient lighting system in our 200,000 sq.ft. warehouse facility. *Even though there was a considerable initial investment, given the energy efficient bulbs installed along with the censored lighting, this process has saved RSD approximately $11,000.00 in electrical costs/yr..*

In 2009, we leased a 100,000.00 kWh solar panel system at our WRJ VT from Earth Turbines that was installed by GroSolar of WRJ, VT at our Warehouse. The solar panels produce roughly 8,333 of our own kWh each month. Enrolling in the GMP solar program saves an additional 6¢ on each kWh produced, a significant savings to our bottom line.

Lastly, our most recent effort to be green took place in our newly constructed 30,000 sq.ft. building in WRJ, VT, a*ffectionally named the Roundhouse.* To provide the most vibrant & efficient lighting available to our maintenance floor below we installed a solar light tracking system which rotates, useing mirrors and sunlight to illuminate the work areas below. RSD has not currently moved into this facility yet, but is planning our move in the upcoming fall. When we are fully in function, we estimate this system to will save 54,000 kWh/year.

In closing: the sustainability of any business today has to consider energy costs. It is our hopes on what RSD has accomplished thus far has helped to secure our business for the future.

rsdwrj@rsdcompanies.com Richard S. Daniels
RSD Companies ♻

resources

SOLAR & RENEWABLES LINKS:

- **Efficiency VT** www.efficiencyVT .com. *This is a must go to site for immeasurable amounts of info.*
- **SEIA/ Solar Energy Industries Association:** **http://www.seia.org/** *The SEIA Tax Manual to answer your solar related tax questions.*
- **Dsireusa.com. www.dsireusa.com.** Renewables & Efficiency. Find state, local, utility, & federal incentives for renewable energy & energy efficiency.
- **IREC/ Interstate Renewable Energy Council:** www.irecusa.org. *RE educational info.*
- **NABCEP/ North American Board of Certified Energy Practitioners: www.nabcep.org** *This organization that tests & certifies PV system installers. Individuals are Certified, companies are not.*
- **NESEA/ Northeast Sustainable Energy Association:** www.nesea.org. *Focused on N.E. US, for consumers & industry- RE & clean building info, events…*
- **NHSEA/ New Hampshire Sustainable Energy Association** www.nhsea.org.
- **NYSEIA**/ New York Solar Energy Industries Association: **www.nyseia.org**.
- **RENEWABLE ENERGY VT- www.REVermont .org**
- **Clean Power Estimator:** www.consumerenergycenter.org/renewables/estimator
- **The Energy Grid: www.pvwatts.org**
- Find Solar: **www.findsolar.com**
- **Energy Star Federal Tax Credits**; www.energystar.gov/taxcredits.
- **Tax Incentives Assistance Project** (TIAP): www.energytaxincentives.org.
- **American Solar Energy Society** (ASES): www.ases.org.
- **Energy Efficiency & Renewable Energy Clearinghouse** (EREC): http://eetd.lbl.gov/newsletter/CBS_NL/nl6/Sources.html.
- **Federal Energy Regulatory Commission (FERC):** www.ferc.gov.
- **National Association of Energy Service Co.** (NAESCO): **www.naesco.org**.
- **National Renewable Energy Laboratory** (NREL): www.nrel.gov
- **Renewable Energy World** www.renew
- **Energy Efficiency & R/E Clearinghouse** (EREC): *http://eetd.lbl.gov/newsletter/CBS_NL/nl6/Sources.html.*
- **Federal Energy Regulatory Commission (FERC): www.ferc.gov**.
- **Solar Living Source Book: www.realgoods.com**
- **Home Power Magazine** www.homepower.com
- **Solar Components:** www.solar-components.com
- **www.backwoodssolar.com** *Specialty: solar, off-grid.*
- NEsolar.com
- **http://www.nationalsolarinstitute.com/**
- **http://www.vthomeownership.org/** *Low-cost energy loans*
- **www.energyguide.com** *Unbiased advice about today's energy choices. Find ways to save, lower your bills & help the earth's environment.*
- **http://hes.lbl.gov/** *Interactive site to help you identify & calculate energy savings opportunities in your home. A lot of great information!*
- **http://aceee.org/consumerguide/index.htm** *Consumer guide to home energy savings…*
- **Hydro** - www.communityhydro.biz
- **Wind** - www.earthturbines.com
- **http://energyfreegreenhomes.com/**
- **VT Energy Investment Corporation (VEIC)** *nonprofit organization that issues home energy ratings for new & existing homes. 800-639-6069. www.veic.org/*
- **http://www.smartpower.org/**
- **Greywater info**-*www.oasisdesign.net/greywater/*
- **Weatherization, Energy Star & refrigerator guide** http://www.waptac.org/
- **http://buildingsdatabook.eren.doe.gov/**
- **The Office of Energy Efficiency & Renewable Energy (EERE)** *http://www.eere.energy.gov/ develops & deploys efficient & clean energy technologies that meet our nation's energy needs.*
- **VPIRG** - *understand the clean energy resources available to VT. http://www.vpirg.org/cleanenergyguide*
- **U.S. Department of Energy (DOE)** *Energy Efficiency & Renewable Energy: www.eere.energy.gov/consumer. Guide to energy efficiency*
- **TRACK THE STIMULUS MONEY-** *http://www.recovery.gov/Pages/home.aspx*
- **Dept. Public Svc. (CEDF)** *http://publicservice.VT .gov/energy/ee_cleanenergyfund.html* ♻

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Villagebuilding Convergence (VbC)

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OG Natural Wool Products: Pillows, Mattress covers, wool batts for quilt fillers, handspun yarn - various colors, custom washing & carding. Large felted wool pieces custom designed by you! Natural lamb & machine washable sheep skins, beginning spinning lessons-wheels provided. havewool@gmail.com **802-353-8656.**

BOOK REVIEWS

RECOMMENDED READING

Confronting Collapse *by Michael C. Ruppert*

Fresh Food from Small Spaces *by R. J. Ruppenthal*

Small-Scale Grain Raising, 2nd Edition, *by Gene Logsdon*

Time's Up! ***An Uncivilized Solution to a Global Crisis,*** *by Keith Farnish*

The Transition Timeline- ***For a Local, Resilient Future*** *-Shaun Chamberlin*

Future Scenarios - How Communities Can Adapt to Peak Oil & Climate Change, *by David Holmgren*

The Organic Farmer's Business Handbook, *by Richard Wiswall*

The Carbon-Free Home, *by Rebekah Hren, Stephen Hren.*

The Passive Solar House, *by James Kachadorian.*

Wind Energy Basics, 2nd edition, *by Paul Gipe.*

The BIOCHAR DEBATE, *by James Bruges.*

ENERGY FREE - Homes for a Small Planet *by Ann V. Edminster.*

LIVING ABOVE THE STORE -*Building a Business That Creates Value, Inspires Change, Restores Land & Community,* *by Martin Melaver*

GAIA'S GARDEN ***A Guide to Home-Scale Permaculture*** *by Toby Hemenway*

CHELSEA GREEN PUBLISHING
the politics and practice of sustainable living

NEW REVIEWS:

Visit www.chelseagreen.com to order these books or other sustainable books from Chelsea Green Publishing

Energy FREE - ***Homes for a Small Planet,*** *by Ann V. Edminster*
This is a great technical guide with a mission to design, build & run our homes the right way! G.E.T. highly recommends this book! As Ann prefaces it "The real point isn't hitting the zero mark; it's achieving freedom from the tyranny of oil addiction. It's about freedom".

Buildings of Earth and Straw - ***Structural Design for Rammed Earth and Straw-Bale Architecture,*** *by Bruce King, P.E.*
There is an interest and growth spurt for straw bale and rammed earth construction that needs to turns to action. There is definite resistance from mainstream construction and lending communities unfamiliar with these materials. King is a structural engineer and this provides technical data and info you need to understand before undertaking this on - *a worthy read.*

Simple Food for the Good Life - ***Random Acts of Cooking and Pithy Quotations,*** *by Helen Nearing*
Helen and Scott Nearing were the pioneers, example and goal for many of the baby boomers. This book is for those that forever dreamed of visiting them and sharing in their experience. It is not an easy read with all of the quotations. The Typeface makes it also difficult to read and uninviting, but if you can get past this, it gives you some insight of Helen, herself and how their daily eating preference might have led to their longevity.

eaarth

by Bill McKibben

A book Review by Jessica Tanner for Green Energy Times

Bill McKibben's Eaarth opens with a list of facts about global warming that will either propel you to work harder to turn this sinking ship around or throw up your hands in despair. Ie: "changes in surface temperature, rainfall, and sea level are largely irreversible for more than a thousand years after carbon dioxide emissions are completely stopped." Peak oil (we are travelling down the declining slope of world oil supplies) will soon turn companies like Walmart into dinosaurs. The federal government has propped up these large corporations, but at the local level we have, as McKibben puts it, the "advantage of smallness: mistakes are mistakes, not crises, until they're interconnected into a massive system."

I predict that a lot of people will read Eaarth. If the reader functions like an elephant, (a keystone species, that benefits its environment and other creatures) then he or she will use the information in the book as a tool for inspiration. Clearly the majority are still living in denial, thinking that it can grow its way out of the climate disaster unfolding with a little green technology without understanding how the Earth's basic systems function. Can this book jolt some deniers out of sleep? Yes. Enough? Probably not. ♻

Sanders Calls Climate Change Setback Disappointing
Solar Power Prospects Brighter

WASHINGTON, July 23 Sen. Bernie Sanders (I-Vt.) said today he was disappointed that Republican obstructionism forced Senate leaders to abandon plans to pass a comprehensive energy bill this summer to deal with the global warming.

"I am disappointed that because of Republican obstructionism and the need to get 60 votes to overcome a filibuster, the Senate has not been able to go as far as it should in transforming our energy system," Sanders said.

The Senate now plans to pursue a more limited measure focused on responding to the Gulf of Mexico oil spill and increase energy efficiency. "While the proposed bill offered by Majority Leader Reid contains important provisions, it goes nowhere near far enough."

Sanders said he is more optimistic about a solar energy bill* he proposed, which has 16 cosponsors. He said, "The United States now has the potential to create millions of jobs by moving away from foreign oil and fossil fuels into energy efficiency and such renewable energy sources as wind, solar geothermal and biomass. I'm going to do everything I can to fight for my legislation which would move us toward 10 million solar rooftops in 10 yrs."

The Senate energy committee on Wednesday voted 13 to 10 for Sanders' bill that would authorize $250 million for competitive grants in 2012 and additional funding through 2021. Along with existing incentives, the program could meet and exceed the goal of installing 10 million solar systems over a 10-yr period, according to the U.S. DOE.

* Summary of The Ten Million Solar Roofs Act of 2010 (S. 3460)

July 21, 2010 The Ten Million Solar Roofs Act of 2010 (S. 3460) was introduced by Sen. Bernie Sanders, a member of the Senate Energy and Environment Committees and chairman of the Green Jobs Subcommittee. The bill was passed by the Energy and Natural Resources Committee by a vote of 13 to 10 on July 21, 2010.

* GOAL: Sets a goal, to be met through this and other incentive and R&D programs, of installing solar electric or water hearing systems on at least 10 million properties in ten yrs.

* AUTHORIZATION: Provides competitive grants through Department of Energy for Fiscal Years 2012-2021, starting with an authorization of $250 million for Fiscal Year 2012. The Department of Energy is directed to provide Congress with a report on recommendations for achieving the ten million solar goal including how to best leverage funds through S. 3460 for Fiscal Years 2013-2021 (those years have an open authorization to provide flexibility to respond to the Department's recommendations).

* FUNDING MECHANISM: Competitive grants to states, tribes, cities, towns, and counties to help them establish or expand solar loan and incentive programs for homeowners, businesses, schools, and other entities. This approach ensures compatibility with existing incentive programs.

* REQUIREMENTS: Solar systems of 1 megawatt (or thermal equivalent) or less are eligible. No homeowner, business, or school can receive federal/state/local incentives worth more than 50 percent of the cost to purchase and install a solar system (excludes loan programs). 20 percent non-federal cost share. Grantees submit to the Department of Energy an implementation plan including how many solar systems they will deploy under the grant, and how many participants will receive incentives or loans. They will certify that grant funds will be used to establish new programs or supplement, but not supplant, existing solar funding.

* CRITERIA FOR GRANTS: Criteria for the grants include ensuring geographic and population size diversity among awardees, and a ensuring a minimum (at least 2% of funding) is available to tribes. Preference is also given to grant recipients who have, or will commit to establishing, net metering, interconnection, and other solar access rules consistent with their authorities. ♻

Solar Schools Update

Last spring, the Vermont Department of Education in association with the US Department of Energy sponsored a competitive grants program providing funding for Vermont schools to install solar power systems. Ten schools received $50,000 grants under this program and following the required public bidding process to hire installers, work is now underway.

The Corinth-based PV installer Sun Catcher LLC successfully received two of these projects – for Crossett Brook Middle School in Duxbury, and for Bradford Elementary School. Sun Catcher, owned by Howie Michaelson, commissioned the Crossett Brook System on July 27. The roof-mounted 14.85 kW PV system includes 66 Solon 225W PV modules, and 2 SMA 7000W inverters.

This robust system is paired with a Deck Monitoring system which will provide real time data on the power system's output to classrooms (and the general public) via the internet. In addition, the system includes a large, flat screen data monitor in the school's lobby. The intuitive and easy to use Deck monitoring interface will allow school children to understand the operation of the PV system, and provide teachers with numerous entry points for learning opportunities.

The Bradford School project will begin in September, and will include both solar thermal and PV systems on the school's roof. The September start provides for a creative partnership with the nearby River Bend Technical School, allowing the tech students to gain first-hand understanding of solar power system construction practices.

To ensure successful performance on the school projects Sun Catcher is partnering with two other solar companies - Kinney and Sun Solar Construction, based in South Royalton, and Triple Play Solar in Montpelier. The principals of these of these companies-- Dan Kinney and Kevin McCollister, have more than fifteen years combined experience installing PV systems of all types and sizes, including many larger commercial systems.

This partnership is already extending its success in working with schools. It was recently awarded a contract to build a 2.7kW PV at the Thatcher Brook Primary School in Waterbury. ♻

Inconvenient Youth: Margaret Gish-Sharon of VT

Ninth grade Sharon resident, Margaret Gish has recently completed training as a presenter and representative for Inconvenient Youth and The Climate Project.

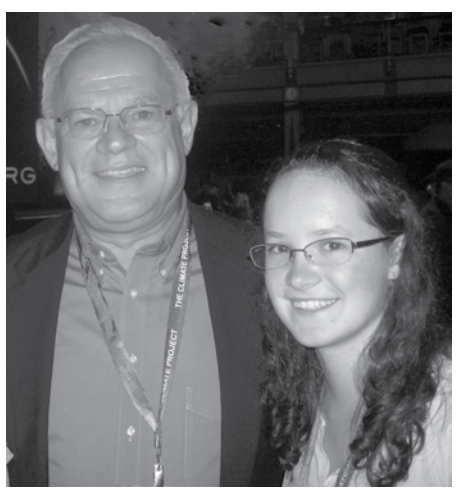
The Climate Project supports more than 3,000 diverse and dedicated volunteers worldwide who have been personally trained by former U.S. Vice President and Nobel Laureate Al Gore to educate the public and to raise awareness about climate change.

Inconvenient Youth is a subgroup of The Climate Project as a community of teenagers taking action to address the climate crisis. With over 675 people from 26 countries, Margaret was one of only 30 youth to attend the training in Nashville, TN, from June 26-28.

She was instructed by Mr. Al Gore to present a completely updated version of his slide show featured in the award winning documentary, 'An Inconvenient Truth'.

Margaret has been inspired into action and is available to local schools and organizations to present the current science and solutions to climate change. Featured speakers at the training also included geophysicist Dr. Henry Pollack from the University of Michigan, Maggie Fox, CEO of the Alliance for Climate Protection, and Larry Sweigert, President of the National Wildlife Federation.

Inconvenient Youth (IY) is based on three central principles: 1) A belief that climate change is a crisis that affects everyone and, because we are all affected, we must all be part of the solution.
2) A belief that as many ideas and actions as possible are necessary to solve the climate crisis.
3) A belief that teens can be leaders in stopping climate change now.


Pictured in the photograph are Larry Sweigert, President National Wildlife Federation and Margaret Gish.

For more information, please visit: http://www.inconvenientyouth.org. To request a presentation from Margaret, please visit: http://www.theclimateproject.org. ♻

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Sun, Baby, Sun!

independence.

We can complain about gov't policy, & yes we need to change these policies. But it's also true that each of us, as individuals is responsible for the situation we are in. When is the last time that you seriously looked into the possibility of installing solar panels on your roof? For most people, the answer is "never" because electricity is still so cheap that nobody really thinks about it. We can run a 1500W space-heater for an hr for only 10¢! Why should we care about energy independence?

The good news is that net-metered solar power has finally hit the mainstream in many US states, including VT, partially because solar power is now effectively less expensive than utility power, & partially because we are waking up to the realities of peak oil & environmental degradation.

Today, any home or business can go solar for about 25% the cost compared to just a few yrs ago, w/ dramatically lower prices & strong ST. & Fed. incentives. In many states people can break even on their solar power investment in less than 5 yrs & have 30+yrs of completely FREE energy after that.

In several states there are now solar financing programs (not related to home-equity) that allow homeowners to install solar power with minimal up-front costs, with a lower monthly payment than their power bill was before they went solar, creating immediate savings & long term energy security. Think of it like switching your power company to the sun. VT lags WAY behind NJ, MA, PA, CT & CA in this regard. It's time for a higher value being placed on ENERGY INDEPENDENCE.

What about cost? Solar power is NOT really expensive anymore. Most Americans are paying more than $.10 to $.12/kWh from their power company. But when you do the math on the cost to install a solar power system (after incentives) & the amount of energy that system will generate over the 25yr warranty of the panels, the cost per kWh of solar-electricity comes out to ~10¢. Solar power is already more cost-effective for homeowners & businesses than utility power. But by purchasing a solar system you are basically buying 25+yrs worth of electricity up-front, adding significant value to your home, which requires a cash investment. (But the panels will produce power for up to 50 years)

In 2009, more than 25,000 US homeowners installed solar power, creating energy security & a clean energy future for their familiesthe # grew by 30% + in 2010, despite the economy. In 2009 there were 4 mil.+ homes that replaced their roofs using a home-equity loan to pay for their new roof. Since solar power is one of the only home-improvements you can do that actually pays you back, why did only 25,000 of those 4 mil. homes go solar?

People are mystified by it & don't know where to begin, or don't even think about solar power, doing nothing because the lights stay. *We don't really value independence - just like to talk about it.*

We clearly have a long way to go. The only way we'll get there is by people taking responsibility for their own future & their own independence. What are we all waiting for?

You have nothing to lose except your utility bill. At groSolar, where I work, we say ***"Sun, Baby, Sun!"***

By Gaelan Brown "An Energy Optimist". See "Energy Optimist" column/blog at www.GaelanBrown.com.

< Cont'd from p.1

NORTH COUNTRY ORGANICS

Just in!: NCO reports that "July's datum: we were up to 7484 kWh on July 31."

How much electricity do they need? *The system, designed by groSolar of WRJ, VT, took everything into account. When a comparison with what they use and what electric they are generating and putting back into the Grid, North Country Organics will indeed meet their goals. This includes the fact that they heat with electric (along with some passive solargain).*

Measures have been taken to reduce their needs, with weatherization, such as a couple of new windows that are sealed well, efficient lighting replacements, equipment and it's usage...

Should YOU consider generating your own businesses' electric needs with renewable energy? With all of the extra incentives and tax credits available for businesses right now, there has never been a better time to move your company into energy independence!

See our Financial/Incentive page to learn more. A complete listing of state and local, utility & federal incentives can be found at Dsireusa.com. www.dsire.usa.com.

>>Cont'd from p.28>>

BARNCATS

photosynthetic pathway. These plants do better in lower light and cooler environments such as in northern latitudes during spring and fall. As temperatures rise and the intensity of light is stronger the rate of CO_2 capture is drastically reduced.

Other plants like crabgrass, sugarcane, sorghum, and corn use the two-stage C_4 pathway where CO_2 capture is separate from the sugar synthesis. As a consequence the net rate of carbon capture and photosynthesis in C_4 plants increases as temperatures and light intensities rise. In corn 80% of the energy in visible light is utilized. The net result is that the production of biomass in an acre of corn is double that of a temperate climate forest.

When the corn is harvested 60% of the carbon captured is added to the soil as crop residues while 40% is in the kernels. The kernels are energy dense, storable, and can be burned as needed to provide winter heat.

Corn efficiently captures solar energy when it is most available and stores it in a usable form until it is needed. It meets the dual requirements of maximizing collection and storage in an energy dense and useable form.

Search "C3, C4, photosynthesis" on the web for more information. ♻

Charlie Hall in front of his Net Zero, Solar powered trapezoid home

Although we had hoped to feature The Barrel Man, Charlie Hall, in this issue of G.E.T. - as a business, we simply ran out of space. So we ask you all to stay tuned for our full story about this self-made Solar expert that - out of pocket - has made an incredible lifestyle and dream a reality. *He sets an example for those that think they can't afford to go solar! DIY Solar is a definite option.* Charlie's story will amaze you! in our Nov. 5 Issue!

Forests-Efficiency-Biomass-VT

Thoughtful Dialogue Across the State

By Jake Brown

A cord of wood neatly stacked in a VT dooryard has long been a symbol of Vermont's self-sufficiency and clever-Yankee use of local, natural resources.

Now, however, dwindling supplies of traditional fuels, rising energy prices and an increasing desire for energy independence, has many Vermonters asking: ***Should we tap our forests even more to meet our energy demands?***

This interest, further piqued by the disastrous oil gusher in the Gulf of Mexico, has many looking for homegrown energy options. So it's no surprise that the idea of using forest biomass — or "low quality" wood that has few other commercial purposes — is drawing more attention.

Listening Sessions

In response to intensifying interest in biomass energy potential, several groups, including the Vermont Natural Resources Council, recently held forums around the state to hear what Vermonters think. It was abundantly clear from the turnout and tone of the three meetings thus far, in Middlebury, Montpelier and White River Junction - that Vermonters care a lot about the issue.

"It's great the discussion is going on, and people are trying to pay attention to the big picture so we pay attention to the resource," said Andy Shapiro, the president of Energy Balance, an East Montpelier energy-consulting firm.

wood chips

Shapiro, who attended the Montpelier forum, notes that if biomass projects move forward that they should involve capturing heat as well as electricity. He also asserts that the heat itself should be used as efficiently as possible, meaning that it should be warming homes that are well-insulated and tight so as to minimize wasted energy.

Another key to assuring a long-term forest fuel source, Shapiro notes, is sustainable forestry practices so that the forest can continue producing the fuel.

"A renewable resource is only sustainable if we take care of it," he says. "Unless we require or implement forest practices that leave the forest in good shape, we will be killing the goose that lays the golden egg."

Dave Mance III, the editor of Northern Woodlands magazine, was also at the Montpelier meeting. He calls Vermont's approach so far "thoughtful."

"I think the vast majority of Vermonters see the value in locally produced energy, and they rightly see biomass as a commonsensical step in that direction. There is legitimate, healthy debate about how best to utilize biomass, electricity vs. heat, but at least most of us are starting from the shared idea that utilizing our forest resources in a sustainable manner is a good idea," he said. He said that policy makers should continue to encourage good forest stewardship and working forests through programs like Current Use.

While Vermont currently lacks a truly comprehensive plan for how the state might harness more energy from our woody resources, there is important dialogue and planning underway.

Cord Wood

What's Happening and Staying Tuned

One of the key entities looking into this issue is the Vermont Biomass Energy Development Working (BioE) Group. This group, created by the Legislature one year ago and comprised of a spectrum of interested parties, is charged with making recommendations on how Vermont might develop and enhance the state's biomass industry while also maintaining forest health.

The BioE Group's draft report is due out this fall, and their plan is to hold a series of meetings to give Vermonters a chance to comment. The group will then consider the comments, and draft the final report in time for the 2011 legislative session.

How Vermont taps its forest for biomass energy is yet to be determined. In the world of dwindling and damaging fossil fuels, staying engaged, informed and solutions-oriented is essential to help Vermont — and the world — meet the energy challenges before us in a thoughtful and strategic way.

Jake Brown is the communications director at the Vermont Natural Resources Council. For more information on the biomass issue and future forums, visit HYPERLINK "http://www.vnrc.org" www.vnrc.org or call VNRC at 802-223-2328. You can follow VNRC on Twitter at jakevnrc ♻

>>Cont'd from p. 28

BIOMASS Addressed

• Biomass used for heat or CHP is most efficient in reducing greenhouse gas emissions over time compared to fossil fuels. Using biomass for electric generation has a slower payback period, taking longer to show carbon-emission benefits.

At the Biomass Energy Resource Center (BERC), we work to support efficient, sustainable, carbon-beneficial biomass energy applications that benefit communities, businesses, and rural economies throughout the Northeast and across the United States.

Andrea Colnes is the policy and development director at the Biomass Energy Resource Center in Montpelier, Vermont. ♻

<<DOE ZERO NRG - Cont'd from p.13 <

Recycled materials were used in building construction such as reclaimed steel natural gas pipes for structural columns and wood recovered from Colorado pine trees that were destroyed by a bark beetle.

As time passes, we will see if the building operates as projected. The Department of Energy plans to share information about the building design through a published manual at the Energy Laboratory's Web site later this yr. ♻

<<Cont'd from p.3 Prouty

also asked by the US Composting Council to author a document for the US Environmental Protection Agency to guide municipal & commercial facilities in Best Management Practices to operating a food composting facility. To view the document, go to: HYPERLINK "http://compostingcouncil.org/education/resources.php" \t "_blank"http://compostingcouncil.org/education/resources.php & scroll down to the "Composting Practices" section. Click on: "Best Management Practices for Incorporating Food Residuals into Existing Yard Waste Composting"

Earthtenders creates complete waste diversion programs providing clients with a positive waste management alternative. Organic waste is separated & removed (or simply received) at Earthtenders' 17-acre composting facility. Materials are recycled into high-value gardening & agricultural products, which are sold. Each year more than 4,000 tons of materials are recycled at Earthtenders rather than landfilled or incinerated.

Municipalities, grocers, restaurants, and others partner with Earthtenders to manage their wastes more responsibly. By par-ticipating in Earthtenders' programs, clients demonstrate stewardship for environment & community while reducing waste management costs. Services include waste stream analysis to identify diversion potential, staff training, collection containers installation, haulers & provide feedback & publicity for your efforts. There are also free educational sessions at the site for groups, schools, & others customized for any group ranging from an hour to a day-long program. Earthtenders also holds public hours so that residents can directly deposit materials.

603-767-0806HYPERLINK "mailto:evamchristen@yahoo.com" evamchristen@yahoo.com ♻

Ingredient Of the Month

Welcome to a new feature of Green Energy Times: 'The Ingredient of the Month'.

In this space we will explore the relationship between natural and artificial ingredients that are ubiquitous in our modern lifestyles and their relationship to the biological systems that are we are an integrated part of.

Organic Chemistry does not have to be a mysterious and arcane field. You shouldn't need a PhD to read your toothpaste label. Large companies have a stake in our collective ignorance. The less we know, the more cheap crap they can sell us! Stay tuned to this column and you will begin to change to way you look at things.

The world around us is built from bits of matter/energy we call molecules. Once you start paying attention to the molecules, your perspective is forever altered….

Chemical ingredient names are the names of the smaller molecules and elements that make up the new, more complex molecule. For example H2O means 2 hydrogen molecules attached to one oxygen molecule – simple! INCI names are internationally recognized name forms that everyone in the world can recognize. Additionally, company trade names are used to describe these same ingredients, which confuses people trying to interpret what they are using.

Sodium Lauryl Sulfate has nearly 200 trade names, obscuring its near universal use as the main foaming agent of Western Civilization. The name tells us what it is. Start with 12 carbon atoms holding hands in string (lauric acid). Add sodium to one end and sulfur to the other. Voila! Sodium lauryl (or laureth) sulfate.

SLS and all foaming molecules work the same way. Imagine a snake with two heads. One loves water (sulfur) and one hates water (sodium). This makes it a bi-polar snake. It violently loves and hates water at the same time. Love water/hate water, love water/hate water, love water/hate water – and it foams….. One could get a PhD in what makes foam. We'll stick to the cartoon explanation for now.

Sodium, carbon and sulfur don't sound all that bad, and you're right. There are a lot worse molecules out there. SLS does a good job cleaning hair, but it is also used in everything from car wash to floor cleaner, shower gels, pet shampoo etc. Nearly everything that foams has some of this in it.

SLS does not exist in nature, and did not exist prior to 1932. Now, millions of tons of the stuff is produced annually, and all of it ends up inoculating floating around our little planet before it breaks down. And that is precisely the rub.

The Green Chemist dares to ask the question; "Do we want to proliferate the planet with molecules that did not exist seventy five years ago?"

Molecules that are not found in nature; that biological organisms did not evolve to deal with, may and do have unintended consequences.

Do we implement a precautionary principal; "ALL new molecules are considered questionable until proven otherwise?" Or stick with the current system; "Find out the cancer causing dose and allow a fraction of that dose to be used in formulations."

In other words, the chemicals are safe as long as they are only a "little cancer causing".

We, and by we I mean all of us people walking around on this little blue ball have to come to terms with some basic and somewhat unpleasant facts. Our current 1950's lifestyle is obsolete and dangerous to our health and the health of the ecosystem that supports us. What will a safe and sustainable lifestyle look like? Will I have to quit bathing and eat worms for breakfast?

Hardly. But as we explore what a sustainable world will look like, we must start by PAYING ATTENTION TO THE MOLECULES.

That is your homework assignment. More next month.

Best Wishes, Soapman.

Larry Plesent is a writer, philosopher, farmer, bookseller and soap maker living and working in the Green Mountains of Vermont.

Learn more at www.vermontsoap.com and www.seasonedbooks.com ♻

SOLAR TIDBIT

Which country produces the most electricity through solar?

Germany. ***Not because it's sun-drenched.*** **Credit the German government's major financial incentives.**

BIOMASS - BIOFUEL

Barn Cats, Energy, & Photosynthesis

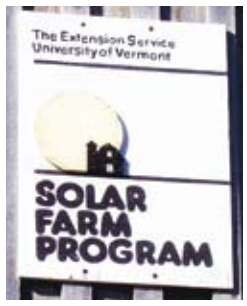
The barn cats first taught us about solar energy. In an old barn there are a limited number of handy storage places. The windowsills are the obvious choice for small things, right? Wrong! In the summer it may be ok, but in the winter they are cat perches! Cats stay warm by following the sun, first the east windows in the morning, then south windows mid day, and the west in the afternoon.

The cat warming experience led us to join the UVM Extension Solar Farm Energy Project in 1978 and to use solar to heat the milking parlor in a new barn. The sun provided all the heat needed except for the coldest periods. We had to use wood to provide supplemental heat as needed.

As a result we learned two principles of solar heating. The first is the need to maximize collector efficiency; the second that the energy must be stored in a useable form.

The most energy dense and usable form is as a solid or liquid fuel.

Photosynthesis is the method that plants collect and store solar energy. The energy in both fossil fuels and biomass originated from the sun and were captured by photosynthesis and is sequestered in various forms of carbon. The major difference between these fuels is in when they were created and in how renewable they are.



Solar energy is most available during the summer months when the days are long and the solar radiation is most intense. Heat is needed in the winter and at night when solar energy is minimally available. The goal is to encapsulate the summer's energy for release in the winter.

All of you have probably observed that not all plants behave the same. For example the bluegrass in your lawn will be lush and will grow rapidly in the spring and fall but will become dormant during mid summer. On the other hand crabgrass will takeoff and overwhelm your garden and lawn when the days are the longest & hottest. These plants use a different path to photosynthesis.

Most plants, like bluegrass, use the so-called C_3

>>Cont'd on p.26>>

Doing Biomass Right

Energy and climate issues are much on the minds of Vermonters and people across the country. Close to home, the release of a new study done for the Commonwealth of Massachusetts on the carbon and forestry implications of biomass energy has galvanized the conversation and is already being used as a launching pad for shifting energy policies in our neighbor to the south.

Sorting out the right role for forest biomass in contributing to a sustainable energy future by providing a renewable, locally produced source of energy depends on doing it right, that is, addressing issues of scale, efficiency, biomass supply, environmental impacts, local economics, harvesting capability, and investment and financing.

The efficiency with which we use biomass for energy varies greatly with different forms of energy and is closely related to issues of scale and sustainable wood supply. Used for heat or heat-led combined heat and power (CHP), biomass energy is approximately 75-80% efficient while generating electricity alone lowers that efficiency to 20-25%, and conversion to liquid fuels for transportation applications are even less efficient overall. To date, however, state and national energy policies have ignored thermal energy and generally encouraged using biomass for electricity and transportation fuels. This has the potential to send our limited biomass resources towards inefficient, large-scale uses that might prove unsustainable over time, with limited benefit to local communities.

If we are to realize the potential of biomass energy to produce a low-carbon source of renewable energy in the mitigation of climate change and greenhouse gas emissions, it is essential to know how much wood is being harvested, from where, and what forest management is in place to ensure re-growth and carbon capture. At the broadest level, there are several important points that need to be understood to sort out the carbon implications of biomass energy:

- *It is not accurate to simply consider biomass energy "carbon neutral." The carbon implications and/or benefits of biomass energy depend entirely on several factors, including: where the wood comes from, applied forest management practices, how harvesting and management are distributed over the landscape and over time, and the types of technology used. When biomass is sustainably harvested and forest lands are well managed over time, biomass can be a source of low carbon energy, especially when compared to fossil fuels.*
- *Over time – if sustainably harvested – forest biomass does not add new carbon to the atmospheric cycle because forest carbon is already in the biosphere while fossil carbon is released from sequestered geologic sources that are additive to the atmospheric cycle. When biomass is burned for energy, carbon is produced and it takes time to re-sequester that carbon.*

>>Cont'd on p.26>>

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Driven By Solar

With a 3 hr charge, there is more than enough power to complete almost any residential yard, with NO GAS, NO OIL and ZERO EMISSIONS. The lack of the sound of an engine running is like the Prius. Turn the key on, click the switch, squeeze the handlebars and off you go... An amazing quietness surrounds you, unlike the endless hum that one faintly if not deafeningly hears all summer long. I could get used to this. I like to 'hear the snow fall'.

Is it going to mow a farmer's field? I haven't tried that yet, so I am really not sure. It is a bit of a run-away on the hills... so it might be a good idea to mow across the hill vs. down it. Did I mention that it has two mowing blades that do a beautiful job? There is a headlight for night time mowing -- 'cuz you do that, right? It is quiet enough that the neighbors would not even know! There's plenty of power to haul a cart/trailer behind.

I am very impressed with the 'Driven By Solar' company, a socially conscious company that cares about the environment. At first I thought that no way can this do the job. Knobby tires move it plenty fast , even with the weight of a full grown man. It's easy to use and a lot of fun to ride.

No more guilt-trip for mowing the lawn - keeps the bugs down *and croquette games on-going.* This is a whole new way to mow the lawn - it will take a little while to realize that it CAN do the job that the gas guzzling, noisy, polluting one used to do. *Here's to a peaceful summer with lots of time to enjoy your lawn. Here's to our planet! For that reason alone, this riding lawnmower is worth it's weight in gold. I am just waiting for them to add a solar panel on it, too. Maybe it will just run itself.* ♻

Redesigning Culture

By Mark Krawczyk keylinevermont@gmail.com

What does your vision for the future look like? Does it involve regional food self-sufficiency, urban farms & gardens, community root cellars & a robust agricultural economy? How about energy efficiency, renewable technologies, regionally-adapted vernacular architecture & co-housing communities? How do people earn 'a living', travel, make decisions, share resources? The future awaits with myriad unanswerable questions. Fortunately, we have one universal tool in our arsenal to help navigate our way - it's called Permaculture.

While the concept of Permaculture (a contraction of the words 'permanent' & 'agriculture') is now over 30yrs old, it's still relatively unknown in most households. Conceived in Australia as a holistic strategy to develop agricultural systems that mimic nature, Permaculture has become an all-encompassing, integrated design science, intended to meet human needs while increasing ecosystem health.

At the very root of Permaculture is the recognition of the pivotal role that humans play in shaping ecology. When we look at human history, we see examples of civilizations who squandered, exploited & destroyed their resource base as well as those that shaped their surroundings so as to improve diversity, increase ecological health, & ensure future generations' access to a rich & thriving resource base.

Humans create ecologies regardless of our intentions. Though many fail to recognize it, cities are ecologies. They are ecologies that are completely 'anthropogenic' (human-created). In Permaculture, we wield positivist action as a fundamental step towards the development of ecosystems that are truly regenerative - that produce clean air; living water; healthy communities & social networks; nutrient-dense food; & rich topsoil. Our works starts with the enlightening recognition that 'we are nature working' & inasmuch can act to restore ecosystem health while meeting our needs, all while leaving a legacy of beauty & abundance. Our goal isn't simply the creation of a perennial agriculture, but rather the development of a vibrant, ecological culture. Whatever your vision, Permaculture design principles & philosophy provide a potent process to revitalize the ecological & human communities of which we are all a part.

Mark Krawczyk is a permaculture designer, educator, natural builder. . . He owns & operates Keyline Vermont, a permaculture & ecological land planning design company that specializes in the design & installation of edible forest gardens. He is cofounder of the grassroots community nonprofit Burlington Permaculture. He lives in Burlington. Find him at www.keylinevermont.com.

DIY COMPOSTING TOILETS

by Steve Herbert

While the focus & awareness in western society is gaining on the side of sustainability, composting human waste is still a topic that seems to remain outside of polite conversation. Yet with up to 1/3 of the potable water coming into our households is literally going down the toilet, an issue of vital importance. Decentralization, or dealing with our waste on site in a dry toilet, not only conserves water, but also would remove much burden on our sewage treatment infrastructure & taxpayers.

Composting toilets create a useful product out of what has always been considered a waste, done by efficient & intelligent management of: 1. moisture, by not using water to flush & in some cases diverting urine out. 2. Temperature, by the sun or an artificial heat source. 3. Oxygen through aeration encourages aerobic decomposition. 4. carbon to nitrogen ratio is managed by addition of material high in carbon, such as wood shavings, or the diversion of urine. Collectively, this all encourages the proliferation of beneficial aerobic bacteria, resulting in effective management of pathogen levels.

Most pre-manufactured systems manage this in a single chamber & without urine diversion. While technology allows this to be done effectively, an alternative would be to custom design & build your own. The advantage is to better suit the specific site, & perhaps at a lower cost. The ideal would be a centralized, double-vault & alternating-use system. Using only one vault at a time, switching to a second vault when the first is full, gives the best guarantee that fresh contents never get mixed with finished product. Urine diversion gives greater control over both moisture & carbon to nitrogen levels.

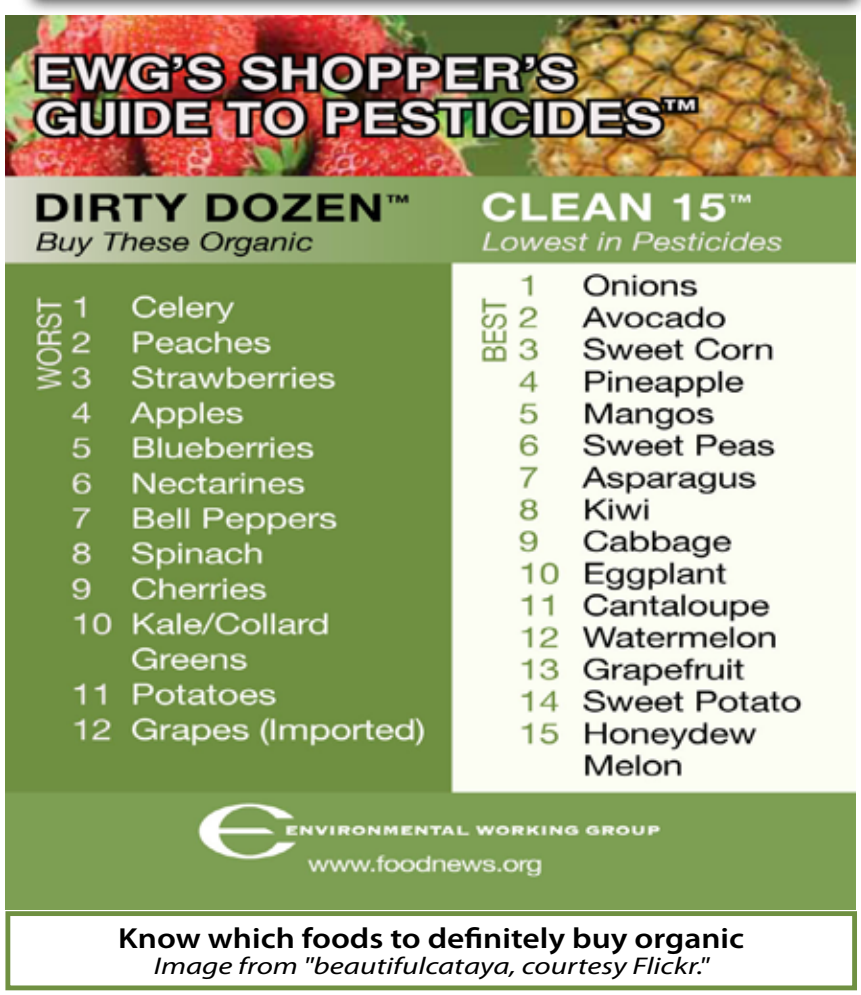
You will face several design considerations in planning your own system. With masonry construction, an inside coating will be necessary to avoid absorption into the walls. Both vaults should be sized to suit usage & built off the basement floor in case of flooding. Urine can be captured for disposal, redirected into the greywater, or collected for use as a fertilizer. Each vault should have an inlet vent. Exhaust venting should be designed to insure maintaining negative pressure inside the vault. A solar panel could power exhaust fan or auxiliary heat source. A "dry flush" material should be used *("one scoop per poop")* to cover the fresh contents & also act as a bulking agent to prevent compaction. The removal port should also allow for periodic inspection or raking the pile flat.

These are the main design aspects to consider. Building your own system can add to the satisfaction that you're handling your own wastes sustainably, conserving water, protecting the environment, & completing the cycle of adding nutrients back to the soil to return as healthy food for the table. ♻

ALPACAS: eco-friendly, socially conscious, environmentally sound

Alpacas truly tread gently on the earth… they are eco-friendly, socially conscious, and environmentally sound. They have soft padded toes that leave the terrain undamaged. They nibble only the tops of plants and grasses, resulting in minimal disturbance of vegetation. Alpacas process hay and grass very efficiently and require much less hay than other farm animals – a square bale of hay will feed at least seven alpacas for one day. Alpacas produce a wonderful organic fertilizer rich in nitrogen and potassium that is prized by gardeners for their fruits and vegetables. "Tidy" by nature, the herd consolidates its manure in one or two spots in the pasture making it easy to collect and compost. And best of all, alpacas produce an abundance of luxurious fleece once described by the ancient Peruvians as "the fiber grown closest to heaven." Soft as cashmere, stronger and warmer than wool, it is used to create comfy sweaters, hats, scarves, mittens, and socks that can effectively tame our cold New England winters. Although alpacas come in 22 natural colors with many variations and blends, they are all truly "green" – these ancient and wonderful animals offer us bright promise for our future! *More information on raising alpacas and working with their fiber can be found at HYPERLINK "http://www.CedarBrookAlpacas.com"* www.CedarBrookAlpacas.com.

Submitted by Kathleen Van Gelder, Cedar Brook Alpacas, Irasburg Vermont. ♻



Know which foods to definitely buy organic
Image from "beautifulcataya, courtesy Flickr."

EarthTalk® From the Editors of E/The Environmental Magazine

Dear EarthTalk: I've noticed that wildflower blooms in the mountains have been coming earlier and earlier in recent years. Is this a sign of global warming? And what does this mean for the long term survival of these hardy yet rare plants? -- Ashley J., via e-mail

As always, it's hard to pin specific year-to-year weather-variations and related phenomena—including altered blooming schedules for wildflowers—on global warming. But longer term analysis of seasonal flowering patterns and other natural events do indicate that global warming may be playing a role in how early wildflowers begin popping up in the high country.

University of Maryland ecologist David Inouye has been studying wildflowers in the Rocky Mountains near Crested Butte, Colorado for four decades, and has noticed that blooms have indeed begun earlier over the last decade. Aspen sunflowers, among other charismatic high country wildflowers, used to first bloom in mid-May, but are now doing so in mid-April, a full month earlier. Inouye thinks that smaller snow packs in the mountains are melting earlier due to global warming, in turn triggering early blooms.

Smaller snow packs not only mean fewer flowers (since they have less water to use in photosynthesis); they can also stress wildflower populations not accustomed to exposure to late-spring frost. According to Inouye's research, between 1992 and 1998 such frosts killed about a third of the Aspen sunflower buds in some 30 different study plots; but more recently, from 1999 through 2006, the typical mortality rate doubled, with three-quarters of all buds killed by frost in an average year thanks to earlier blooming.

Inouye's worrisome conclusions are backed up by experiments conducted by fellow researcher John Harte, who over a 15 year period used overhead heaters in nearby wildflower study plots to accelerate snow melt. The results were the same: Wildflowers bloomed early and not as vigorously.

Several studies in Europe have shown that some species of wildflowers there may be able to migrate north and to higher elevations as the climate warms, but Inouye fears his beloved Aspen sunflowers and many other American wildflowers may be lost forever as they are not able to migrate as quickly as needed in order to survive widespread surface temperature increases and escape extinction.

Harte is also gloomy about the prospects for Colorado's mountain wildflowers. He predicts that the wildflower fields he and Inouye have been studying will give way to sagebrush desert within the next 50 years, whether or not the governments of the world can get a grip on greenhouse gas emissions.

As a hedge against such dire predictions, the nonprofit Center for Plant Conservation is spearheading seed collection efforts on thousands of rare wildflower species across the U.S. for inclusion in the Colorado-based National Center for Genetic Resources Preservation, a repository for both common and rare "prized" American plant seeds. The "banked" seeds, useful if not solely for preserving the genetic makeup of species that may go extinct in the wild, can also be used for future restoration projects on otherwise compromised landscapes.

CONTACTS: David W. Inouye, HYPERLINK "http://chemlife.umd.edu/facultyresearch/facultydirectory/davidwinouye" http://chemlife.umd.edu/facultyresearch/facultydirectory/davidwinouye; Center for Plant Conservation, HYPERLINK "http://www.centerforplantconservation.org" www.centerforplantconservation.org; National Center for Genetic Resources Preservation, www.ars.usda.gov/main/site_main.htm?modecode=54-02-05-00 HYPERLINK "http://www.ars.usda.gov/main/site_main.htm?modecode=54-02-05-00".

Send Questions to: earthtalk@emagazine.com.
E The Environmental Magazine is a nonprofit publication. ♻

Compost Nearly Anything

Composting is basically just turning unwanted organic material into rich humus, for use in the garden. It reduces our 'waste' that goes to the landfill. *How can it be called 'waste' when it turns into rich soil, giving life back to the earth?*

Many items you might not have considered adding to your own compost pile - are indeed compostable!

Dryer Lint - If you must dry your clothes in an electric clothes dryer instead of using a clothesline, at least compost the lint.

Hair and Fur - Human and animal fur add nitrogen and other beneficial nutrients to compost.

Ashes - Wood ashes help to retain moisture and add potassium.

Cotton, Wool & Silk Clothing/Fabric - Natural fibers decompose, esp. if shreded.

Vacuum Cleaner Bags - Full paper vacuum cleaner bags are compostable.

Nail Clippings - from pedicures, manicures - even pet and livestock nails or hooves.

Rope and String made out of natural fibers like cotton, hemp, jute, and manila ropes.

Leather Goods - Clothing and gloves will slowly decompose in the compost pile.

Skunky Beer, Wine, and Corks

Pet Food Leftovers - chewed up rawhide...

Spoiled Milk and Dairy Products - *meat should not be composted for vegetable garden use, but is ok for flowers that you don't eat.*

Non-toxic White Glue, Masking Tape, Post-It-Notes,Teabags, Coffee Grounds & filters, Cotton/Cardboard Feminine Hygiene Products - *as gross as it may sound;* Cotton Balls, Q-Tips; Seaweed/Kelp washed up on the shores; Eggshells add calcium to the soil. Bread, grains, pasta, rice, cereal, crackers, pizza crusts…Holiday Decor, such as pumpkins, wreaths, pine boughs, latex balloons, dead flower bouquets or dried arrangements. *I prefer to just give live plants or perennials.*

As you can see, the list is nearly endless. If it will rot, it is probably better to compost it than send it to the trash. Reduce trash and give back to the earth! Do be careful not to put toxic materials in, negating the benefits you otherwise may benefit from. ***Happy Composting!*** ♻

SUSTAINABLE GARDENING

Green Gardening

by Joann Matuzas

Some of us eat to live while others live to eat. If you fall into the latter category, you are probably bemoaning the passing of summer with its bounty of locally grown produce. No need, with a little planning you can be eating fresh food year round.

Several vegetables including kale, Brussels sprouts, leeks, turnips and rutabagas improve in flavor if they are harvested after a couple of light frosts. Carrots, parsnips and kale can actually be mulched and overwintered for harvest in early spring. There is also still time for a final planting of most greens, lettuce and radishes.

Gardeners can extend the growing season for other crops by protecting them with low tunnels, hoop houses, greenhouses, cold frames and Agribon, a spunbonded polypropylene fabric that acts like an insulation blanket.

• Low tunnels are a mini and much less expensive version of the popular hoop house. They are built by bending electrical conduit or PVC pipes over a garden bed and covering them with Agribon and as the days get colder putting on a layer of greenhouse plastic. This allows the gardener to grow later in the fall and get a jump on the season in the spring. The Hoopbender makes the construction of low tunnels fun and easy.

• Cold frames can be purchased at garden supply stores or easily made by constructing a wood frame over the soil to support a removable translucent top that can be as simple as an old window. The cold frame acts as a mini greenhouse .

• Hoophouses, also called high tunnels, are erected in the field. They are unheated and have roll up sides for ventilation during the summer.

• Heated greenhouses are the ultimate season extender but costs are often prohibitive for the home gardener.

"The Winter Harvest" by Eliot Coleman is a great resource for gardeners who want to explore and learn more about year round vegetable growing.

Root cellars are another way to keep vegetables alive through the winter.

Root cellars can be as simple as a cold, dark corner in the basement or a permanent structure with temperature and humidity control. The basic idea is to keep plants alive by slowing down their metabolism. Vegetables that do well in root cellars include onions, shallots , garlic, potatoes, cabbage, Brussels sprouts, squash, pumpkins and leeks. "Root Cellaring" by Mike and Nancy Bubel outlines the ideal conditions for storing vegetables after the harvest.

Freezing, canning, pickling and preserving are other options. What could be easier than filling a plastic bag with clean, fresh tomatoes and putting them in the freezer for use in sauces or soups during the winter? Refrigerator pickles and dilly beans are also quick, easy and delicious.

If you don't have a garden, you still have options. The "eat locally grown" movement means more farmers are raising crops to meet the demand. The number of farmers' markets in the U.S. has been estimated at more than 5,200 and growing. A recent trend is winter markets where farmers sell seasonal vegetables all year. Supporting local farmers who usually travel no more than 50 miles to market is important as we move toward a more sustainable world. It has been estimated by the Leopold Center for Sustainable Agriculture that fruits and vegetables sold in U.S. supermarkets are shipped an average of 1,500 miles often from other countries. ♻

Eating Local at YESTERMORROW

by Kate Stephenson

At the Yestermorrow Design/Build School in Waitsfield, VT, the curriculum stresses the concept of sustainability with regard to land use and how we build on the land, and through food they "walk the talk" of sustainability by purchasing local, organic, and nutritious ingredients to serve to students and staff. At Yestermorrow eating is a great enabler of community - around the table is where ideas and values are shared, where friendships blossom, and where participants fully integrate their experiences.

In 2007 the school introduced a comprehensive meal program and created an extensive school garden to grow produce for the kitchen. In addition to the food grown and raised on campus, they partner with a variety of local farms and producers to source food. In 2009 Yestermorrow interns built a mobile chicken coop to house a dozen layer hens which lay eggs for use in the kitchen. A full time Kitchen/ Garden Intern is responsible for planning the garden, planting and harvesting produce, cooking (along with the other kitchen staff) and caring for the chickens.

Yestermorrow's 38-acre campus has been developed over the past 10 years as a demonstration site for various building technologies, innovative designs, and Permaculture principles. One unique feature is the Edible Forest Garden where perennial crops are grown, including fruit and nut trees, berries, asparagus and rhubarb. Cold frames are used to extend the growing season into the late fall, and produce is preserved and frozen for use throughout the winter. Other wild foods, including more mushrooms, ramps and fiddlehead ferns are foraged in the woods around campus. All food waste produced on campus is composted to be returned to the gardens to build nutrients in the soil.

And they are now powered by Solar!! This is a fine example of a sustainable school! ♻