

# WEC CO-OP CURRENTS

## October is National Co-op Month Food Co-ops Are Prospering By 'Going Local'

**N**owhere is it written that businesses must be small, locally controlled, and community focused to be cooperatives. Some nationally known, high-profile companies are, in fact, co-ops, though their business model is vastly different from Washington Electric's (their "members" tend not to be individuals, but stores or franchises that conduct their retail operations along traditional, for-profit lines).

Yet the cooperative model, when it features user or consumer ownership, direct elections for boards of directors, and the nonprofit framework which emphasizes service over revenues, can be an almost uniquely "local" institution. When its members are interested, active, and involved, a co-op not only provides the goods and services those members want; it can also be an effective instrument for regional or community development.

Washington Electric Co-op, for example, adopted a policy several years ago to purchase and/or generate, to the greatest extent practical, the electric power its members need from affordable local and renewable resources. That policy has been successful. More than half of Washington Electric's power now comes from sources inside Vermont –

and that means that a great proportion of WEC's money stays in the state and provides jobs and economic development in Vermont.

Food co-ops in the central Vermont area have always done this. But as their popularity has increased in recent years, so has their economic leverage and influence. The 600-member Plainfield Co-op, the 1,000-member Buffalo Mountain Co-op in Hardwick, and the 4,800-member Hunger Mountain Co-op in Montpelier help sustain hundreds of individual growers of farm produce, fruits, dairy, and other high-quality local foods, and hundreds more vendors, distributors, and other businesses that exist to set Vermont tables with locally produced food. And because Vermont-grown lettuce and peppers and onions and bread and cheese and eggs sell briskly, entrepreneurs test their wings making yogurt and beer and coffee and cereal and cleaning products, and bring them to the co-ops for marketing.

And the circle grows wider. In Hardwick, Buffalo Mountain Manager Annie Gaillard explains, the brand new Vermont Soy Company is using the food co-op as a test market for its tofu product.

*continued on page 4*



October is National Co-op Month. In Vermont, food co-ops help support the agrarian economy, while also providing nutritious, wonderful food for our tables.

## Bucking The Trend A Plainfield Solar Hot Water System That Eschews Anti-Freeze

**O**ne winter down, and Bob Atchinson, a Washington Electric Co-op member, likes his "drain back" solar domestic hot water system just fine.

What's not to like? He's had to do only minor tinkering since he and his accomplice, Jarrod Moninger Galvin, mounted the solar collectors on his Plainfield rooftop last fall and connected them, through insulated pipes, to the tanks and equipment in the basement. The results weren't long in coming: the system relegated his original hot

water – heated by the home's basement boiler – to a backup function in the winter and nearly an afterthought once warm weather came. Bob figures the components (two solar panels; a 160-gallon tank filled with 55 feet of coiled copper tubing, like intestines; a small, adjacent drain-back tank and monitoring system that controls the circulation to and from the rooftop collectors; plus assorted gauges, pipes and other parts) totaled around \$5,000 – not bad for a system that significantly

*continued on page 6*

### Inside

**WEC to submit revised rate design for PSB review.** The board and staff have completed a Cost-of-Service Study and a proposal for changes in WEC's rate structure based on that study. Co-op President Bernstein explains the process and its implications for members on page 3.

**The end of Edison's bulb?** A new era of mandatory energy efficiency may cause the incandescent light bulb to modernize – if possible – or go dark. Page 8

**What's worse, turbine blades or cats?** In response to a Co-op member's concern about wind power and bird fatalities, information and websites are



Two new linemen-in-training have joined the Co-op's staff. Meet Kyle Sands and Donnie Singleton on page 7.

provided in the *Letters to the Editor* section. Page 2.

**In celebration of October (which is Co-op Month),** remind yourself about the Seven Cooperative Principles. You can read them on page 3.

### Washington Electric Cooperative

East Montpelier, VT 05651

## Members Write

**Co-op Currents welcomes letters to the editor that address any aspect of the Co-op's policies and operations, or any matters related to electricity. Readers can write to Co-op Currents, P.O. Box 8, East Montpelier, VT 05651. Letters to the editor will not be published in the Annual Meeting (April) issue.**

### Feds Step In On Wind

Editor, *Co-op Currents*:

Re your September *Co-op Currents* (specifically, the article, "PSB Approves Sheffield Wind Project").

Not so fast! I previously wrote Mr. Patt regarding my take on the wind electric-generation project, focusing primarily on my concerns that studies around the issues of wildlife and avian displacement had been inadequate. Mr. Patt disputed this, citing other states and other state studies.

While it is rare to find cause to applaud our federal government, I do so today for their stepping in and pulling up the reins on the Vermont Public Service Board's regrettable approval of the wind electric-generation project. And what did the feds give as the reason? That's right, Mr. Patt – the failure of Vermont to adequately study the issues of wildlife and avian displacement.

Sincerely,

Rachel A. Hexter  
Greensboro Bend

### General Manager replies:

While it is a bit frustrating that after a very thorough review of wildlife impacts and extensive review by Vermont's Agency of Natural Resources and the Public Service Board, a federal agency has now asked for further information on this subject, the developer, UPC, is confident that their concerns will be addressed. Rather than debate this at length (I am not an expert on bird and bat migratory patterns), I would simply refer readers who want to know more about this to these sources:

- UPC conducted voluminous wildlife impact studies that were thoroughly reviewed during the approval process. All of these documents are available for public review at: [www.sheffieldwind.com](http://www.sheffieldwind.com).
- The Public Service Board's findings, discussion, and conditions imposed on UPC regarding wildlife and other environmental issues is available at: <http://www.state.vt.us/psb/document/7156upc/7156finalorder.pdf>

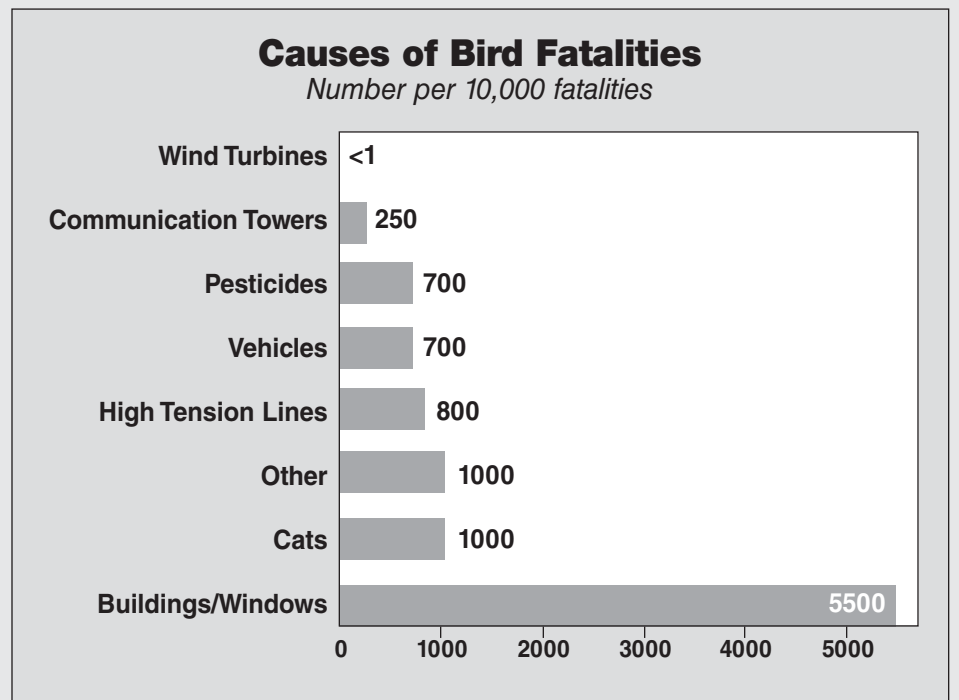
There are now numerous large wind farms (most are larger than the Sheffield project) operating successfully all over the country and the rest of the world. High bird kills have been an issue in a

tiny number of cases, including a very early facility in California that offered raptors perches on erector-set type towers. Modern "monotowers" do not offer perching spots. There have been unexpectedly high bat kills at a site in West Virginia and one in Pennsylvania, but it has not been reported as an issue almost anywhere else.

It is time to put this issue in perspective. It is expected that a bird will, on rare occasions, hit a turbine blade and die. If we do not build wind projects, what is the impact on birds from where we get electricity from now or will otherwise in the future? The other alternatives, whether it's fossil fuels or massive new

dam construction in Quebec, are worse for the birds.

And lastly, humans cause a lot of bird fatalities each year, but it's not from wind turbine blades. If WEC members really want to look at this in depth, I suggest a study titled *Avian Collisions with Wind Turbines: A Summary of Existing Studies and Comparisons to Other Sources of Avian Collision Mortality in the United States*. It's available at: [http://www.nationalwind.org/publications/wildlife/avian\\_collisions.pdf](http://www.nationalwind.org/publications/wildlife/avian_collisions.pdf). Or perhaps this graph from that study will put this issue in perspective more briefly:



## Co-op Currents

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WEC is part of the alliance working to advance and support the principles of cooperatives in Vermont.  
[www.vermontcooperatives.coop](http://www.vermontcooperatives.coop)

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The Board of Directors' regularly scheduled meetings are on the last Wednesday of each month, in the evening. Members are welcome to attend. Members who wish to discuss a matter with the Board should contact the president through WEC's office. Meeting dates and times are subject to change. For information about times and/or agenda, or to receive a copy of the minutes of past meetings, contact Administrative Assistant Deborah Brown, 802-223-5245.

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## President's Report

# WEC To Submit New Rate-Design Proposal To PSB

By Barry Bernstein

Before the end of the year, your Co-op will be filing its first Cost-of-Service Study (COS) and rate design in more than a decade. This filing is a result of the commitment the Co-op made to the Vermont Public Service Board (PSB) in 2005 to submit a new COS and rate design after our Coventry landfill project was up and running.

As implied by its name, a Cost-of-Service Study determines how much it costs the Co-op to provide power and service to different membership (or customer) classes, such as residential, commercial, and large industrial customers; the COS also breaks down costs within those classes, such as between residential members with high electricity usage and those with low usage.

Rate designs utilize this information to attempt to assign fair and accurate charges to customers for their power. Rate design proposals must not result in an overall increase in revenues

to the coop, and they must be based on actual costs to the company. Rate designs also set the monthly customer charge and the costs to members for various blocks of power that they receive. Together, these components determine the size of individual bills for various usage levels.

### PSB Consideration

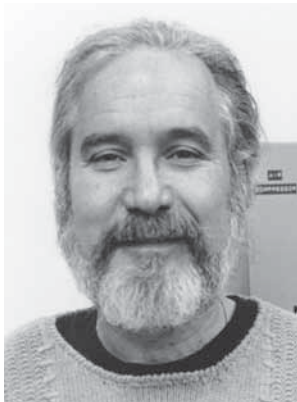
For the 98 percent of WEC's members who are in the residential class, the new rate design to be submitted for PSB consideration will have a lower customer charge and a three-tier, inclining block of rates, replacing the present two-tier inclining block structure.

The first and lowest-cost block, 75 kilowatt-hours (kWh), will be federally financed power from NYPA (the New York Power Authority). This represents a reduction from our present 150 kWh-per-member block of power – the result of less power coming to Vermont from this source. The charge for this block, which is received only by our residential members, will be approximately 7 cents/kWh.

The second block, consisting of 300 kWh, will be supplied from a number of baseload power supply sources including WEC's Coventry plant, and will be sold to our members at the intermediate rate of approximately 11 cents/kWh. The third – or "tail" – block will be priced at 17 cents. (At present, WEC's tail block – applied to all usage above 150 kWh – is sold at about 16 cents.)

The Board's Members and Markets

Committee, chaired by Vice President Roger Fox, spent nearly two years working with Co-op staff and our consultant, Stan Faryniarz of La Capra Associates, on the rate design. The committee explored various scenarios and their potential impacts upon the members who make up the different rate classes. The policy decisions that go into forming a rate design were discussed thoroughly by committee members and the entire Board of Directors.



The final rate design, as submitted to the PSB, was approved by your WEC Board of Directors.

It represents our attempt to achieve a number of goals, while not increasing the overall revenue of the Co-op. The first goal was to fairly allocate actual costs incurred among various classes of

customers. The second goal was to provide a rate structure for our residential members that recognizes two critical factors: the increasing cost of new power sources that are coming online, as a result of rapidly changing global

conditions; and the need to guarantee that our members will receive enough power in the two lower-tier blocks, at stable rates, to meet the basic functional needs of their homes.

While the new rate design will lower bills for about 95 percent of our residential members, there will be some who will see an increase, between 1 percent and 7 percent, for comparable usage. The two groups that will be impacted include members, like myself, who use between 100 and 200 kWh a month, and those who use more than 1,300 kWh a month. I know that even though we have not had any overall rate increase since January 2000, and do not expect to have any additional rate increases for at least the next few years, there will be a small number of members (about 5 percent) who will see their bills go up as a result of the change in the structure of our rates.

I want all our members to know that your Board of Directors gave serious consideration to the various options presented. Further, we are committed to working with our membership to help every interested household and business maximize the efficient use of electricity so as to minimize any impact on your individual bills that will result from this new rate design, if it is approved by the PSB.

While WEC may be the first utility to propose a three-tier rate structure, I am sure we will not be the last, given the changing economic and environmental landscape of the world we live in.

### 'The Pledge' is coming

In the near future, your Co-op will introduce a pilot demonstration project of a new, voluntary program in which we hope, eventually, to enlist a large portion of our membership. Based on the results of that pilot, we hope, within a year, to introduce a full-fledged program in which we will ask households and businesses all across our system to commit to working together to make more efficient use of power and to reduce our Co-op's power consumption, both in terms of total kilowatt-hours used and in the total cost of each participant's electric bill.

WEC stepped forward in the early 1990s to invest in energy efficiency in our members' homes and businesses. In that effort, we became a leader in the state – the electric utility that had the greatest impact in helping its members lower their electric bills while also improving the comfort of their homes. We stepped forward again in 2005 to build the Coventry, Vermont, landfill gas-to-electric generating plant, which has enabled us to provide more than 50 percent of our members' power from an economically

(and environmentally) favorable source. We stepped up yet again, these past two years, to participate in the UPC Sheffield Wind project, which in August became the first new wind-power project approved by the Vermont Public Service Board.

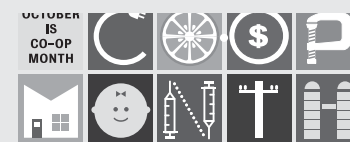
And we are stepping forward again now, to submit a three-tier, inclining block rate design for consideration by the PSB that is intended to more accurately reflect what it costs to serve different kinds of members based on their class and the amount of electricity they use.

We hope you will continue to give us your support. I ask you to remember how far we have come in the past 20 years working together, and to view changes in the context of a 20-year period in which WEC's leadership has demonstrated its commitment to sharing the cost burdens of our electric utility equitably among our members, while working diligently to reduce those costs.

Please feel free to call me or any member of your Board of Directors to discuss the rate design and any other issues on your mind.



## Co-op Principles



**1. Voluntary and Open Membership** — Cooperatives are voluntary organizations, open to all persons able to use their services and willing to accept the responsibilities of membership, without gender, social, racial, political or religious discrimination.

**2. Democratic Member Control** — Cooperatives are democratic organizations controlled by their members, who actively participate in setting their policies and making decisions. Men and women serving as elected representatives are accountable to the membership. In primary cooperatives, members have equal voting rights (one member, one vote) and cooperatives at other levels are organized in a democratic manner.

**3. Member Economic Participation** — Members contribute equitably to, and democratically control, the capital of their cooperative. At least part of that capital is usually the common property of the cooperative. They usually receive limited compensation, if any, on capital subscribed as a condition of membership. Members allocate surpluses for any or all of the following purposes: developing the cooperative, possibly by setting up reserves, part of which at least would be indivisible; benefiting members in proportion to their transactions with the cooperative; and supporting other activities approved by the membership.

**4. Autonomy and Independence** — Cooperatives are autonomous, self-help organizations controlled by their members. If they enter into agreements with other organizations, including governments, or raise capital from external sources, they do so on terms that ensure democratic control by their members and maintain their cooperative autonomy.

**5. Education, Training and Information** — Cooperatives provide education and training for their members, elected representatives, managers and employees so they can contribute effectively to the development of their cooperatives. They inform the general public — particularly young people and opinion leaders — about the nature and benefits of cooperation.

**6. Cooperation among Cooperatives** — Cooperatives serve their members most effectively and strengthen the cooperative movement by working together through local, national, regional and international structures.

**7. Concern for Community** — While focusing on member needs, cooperatives work for the sustainable development of their communities through policies accepted by their members.

## Food Coops

continued from page 1

"They're seeing how it goes with our members, which will help them refine their process until they're ready to release it to more co-ops," says Gaillard (who reports that the tofu is going over well with Buffalo Mountain shoppers). Increased popularity of soy products, such as tofu and the company's four flavors of soy milk, has peaked interest within the agriculture community in sowing more Vermont fields in soybeans. A local company, High Mowing Organic Seeds of Wolcott, markets soybean varieties (complete with recipes on its website).

"It's fun watching the interconnect-edness of all this," says Gaillard. "There's a wonderful, ripple effect happening in the local area."

October is National Co-op Month, an observance of the cooperative economic model which Washington Electric marks in these pages every year. So in celebration of co-ops that, like WEC, promote the use of local resources to make Vermont (and Vermonters) more self-sufficient, Co-op Currents profiles these three food co-ops, which have played an important role in the life of their members and their communities for decades, and are, if anything, gaining in their influence.

### Plainfield Co-op

You're not going to stumble across the Plainfield Co-op, which occupies a small retail space tucked slightly off the village's Main Street near the volunteer fire house. There's a lovely sign outside, but basically you have to know where it is to get there.

Local growers do. Although it is the smallest of the three area food cooperatives, Chuck Alaimo, one of a trio of store managers who cooperatively run the Plainfield Co-op, says there is no problem finding local producers wanting space on the co-op's shelves. That means that the members and customers who trade at the Plainfield Co-op are putting money directly into the pockets of their neighbors in this rural community.

The co-op is small by choice (although, Alaimo says, some members would prefer a larger space and better visibility – changes the Plainfield Co-op is contemplating). This was the original Hunger Mountain Co-op, which grew and prospered and moved to Montpelier. Some of the Plainfield members wanted to keep their food co-op local, so they broke away from Hunger Mountain and re-established their own cooperative, known for a while as the Winooski Valley Cooperative, but then, as of 2004, as the Plainfield Co-op. Alaimo says members also live in Marshfield, East Montpelier, Cabot, and Calais.

"We carry as much local produce as possible," he says. Ironically, though, the 600-member co-op also suffers for its members' affinity for locally grown food. "We live in a rural area, so during the time of year that we have our greatest selection our members are growing much of their own food," Alaimo says. Potential sales are sometimes lost to people's own gardens.

Another problem is that local food



Annie Gaillard of Buffalo Mountain Co-op in Hardwick sees a renaissance going on in her community, with new Vermont-based companies supporting and expanding the horizons of local agriculture.

products (people active in the movement generally define "local" as food from within a 100-mile radius) usually cost more than products imported from 2,000 miles away – preposterous, but true.

"[Products from] small-scale operations are generally going to end up being more expensive," says Alaimo, "unless you're talking about the bigger local operations, like Cabot, which actually are national.

We're selling [a local brand of hot sauce] that tends to be much more expensive than Annie's, which used to be local. It's an issue that we struggle with."

And despite the resurgence of interest in locally grown foods, people's expectations have expanded.

"Right now we have a full line of apples

from Champlain Orchards, as much as we can stuff in here," says Alaimo. "But people want, and have come to demand, mangos, papayas, and bananas. You're never going to grow those in Vermont."

Winter, of course, is a difficult season for providing Vermont produce other than root vegetables, but local meats – beef, pork, and chicken – remain available. In fact, providing fresh, local meats, rather than frozen imported meats, is one of the factors, Alaimo believes, that have spurred the co-op's growth.

"We ended 2004 with less than \$400,000 in sales," says Alaimo, "but it's probably going to be \$700,000 or more this year."

Sales, he says, were up 18 percent just in the past year, a relative prosperity that is reflected in upgraded refrigeration units and other improvements. In addition to fresh, local meats, Alaimo attributes the growth to effective management, increased involvement of members, and expanded selections. Jenni Jenkins, another of the trio of store managers (the third is Nancy Ellen), agrees that

the Plainfield Co-op has merged from a period of financial and managerial difficulty and found its identity again.

"We're now financially solid, we follow the Co-op Principles, and we're trying to provide for the community at large," says Jenkins. "We're focused very much on supporting our local [food] producers. That's important to all of us who work here, and to the membership."

### Hunger Mountain Co-op

"We are fundamentally a natural foods store," says Kari Bradley, general manager of the 4,800-member Hunger Mountain Co-op in Montpelier, which also has a large customer base of non-members. "When we did a planning process this year and asked in a survey what parts of the co-op's mission were most important to people, providing

natural and organic foods was the highest-ranked, but 'local' came in a close second.

"There's a lot more interest in local foods and local food systems in the last few years," Bradley explains. "We work with more than 200 Vermont-based vendors, which is a real difference from conventional supermarkets, who prefer to work with as few vendors as possible."

As a well-established market with a dedicated clientele, Hunger Mountain is an attractive venue for regional growers and producers. Innovators with a new product line or a different idea seek out the co-op, and Bradley says that Hunger Mountain makes a strong effort to support them.

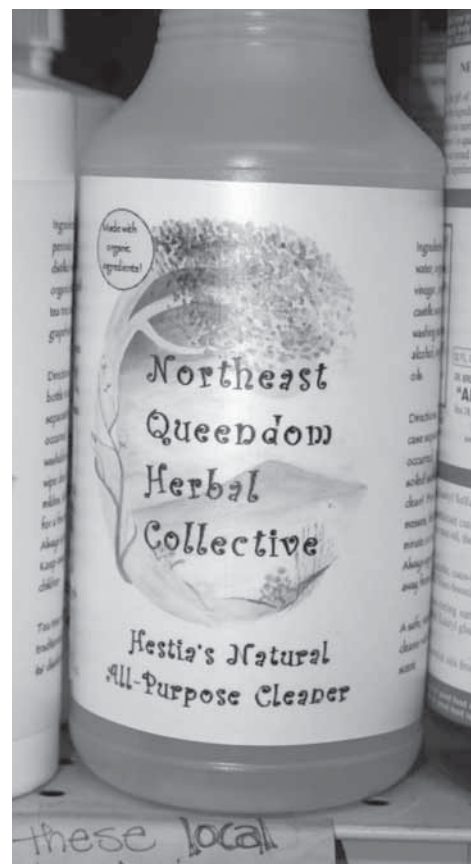
"Vendors will come with an idea, and sometimes with a sample. We'll work with them on developing their product or on their business plan, pointing out what they need to do to be successful. We've got buyers who have been in the business for ten or twenty years, and have that experience. As long as [the vendors or producers] meet our standards as being natural with no artificial ingredients we'll do what we can to get them into the store, to feature them on the shelves, so hopefully they get a foothold in the market."

As Vermont consumers are increasingly coming to favor local food products, Bradley observes an economic shift.

"In the last few years we've seen local, organic produce become competitive," he says. "It used to be that the economies of scale for California growers, or wherever, allowed their costs to be lower. But with costs of transport and with the growth of the local produce market, we're seeing the farmers here develop their own economies of scale.

"And," he adds, "there's a big difference in terms of food quality."

Bradley cites the example of Witchcraft garlic, a local company that is constructing a storage facility to provide



A staple on the shelves of the Buffalo Mountain Co-op.

its product year-round. “Meanwhile, the global market for garlic is going to China. So this is very encouraging from a local perspective.”

Besides produce, Hunger Mountain does a brisk business with a range of local products: breads and baked goods (“We live in a wonderful part of the world for local breads; we’re able to provide exclusively local breads, except for specialty items like pita”); dairy (“Fluid milk and cheeses are a big local category for us; very high-quality cheeses are put out in Vermont”); beer, coffee, meats, poultry, and Seventh Generation cleaning and paper products.

“Last year,” says Bradley, “we paid out \$4.2 million to 400 Vermont-based producers and services, which is just about half of our cost in goods.”

Those numbers presumably will rise further once Hunger Mountain completes a 7,000-square-foot expansion. The nine-month construction project will extend the building out from its sides, leaving the parking lot intact, and will incorporate “green” energy features like skylights and more-efficient refrigeration systems.

“Our support for local [foods and products] comes from a number of concerns,” the manager summarizes. “There’s the economic motivation of keeping dollars in our community. And there’s also a re-emphasis now on fresh, high-quality foods that you’re more likely to get from a local craftsman than on the national market. So ‘local’ plays well here at the co-op, for both of those reasons.”

### Buffalo Mountain Co-op

The emphasis has always been on ‘local’ at the 1,000-member Buffalo Mountain Co-op in Hardwick, since its founding 32 years ago. But in recent years, ‘local’ has gotten more diverse, more interesting, and more compelling, as the co-op finds itself in a community that is enjoying a sort of renaissance.

“Over in the industrial park we’ve now got the Vermont Milk Company and the Vermont Soy Company,” says Buffalo Mountain’s Annie Gaillard. “The Vermont Milk Company is buying from local dairy farms and making cheeses and ice cream.” (Gaillard says the company, which began production this year, still lacks some of the equipment necessary to produce fluid milk. But it produces cheddar curds that she describes as “really yummy,” and mozzarella in partnership with Maplebrook Farm, a Vermont company which supplies the recipe.)

The Vermont Soy Company, spreading



Kari Bradley, general manager at Montpelier's Hunger Mountain Co-op, poses among the fresh fruits and produce that are a major attraction for the region's largest food cooperative.

the gospel of soybeans and tofu, hopes to expand the horizons of Vermont farmers. The company is linked to Vermont Natural Coatings, which makes a whey-based urethane product for woodworking – “And they’re getting the whey from the Vermont Milk Company,” says Gaillard enthusiastically, “because they’re making cheese!”

Such synchronicity!

“This is really exciting,” she says, “because we are SO on the radar. It’s really revitalizing the community and helping out a lot of small family farmers that have been struggling. The Hardwick Diner is now serving locally raised meat! How great is that?”

Buffalo Mountain Co-op, too, sells local beef and pork, “and local eggs, usually,” says Gaillard. It stocks Misty Knoll chicken from over in the Champlain Valley (still within the definitive 100-mile radius), and provides a retail outlet for the Northeast Queendom Collective, which makes cleaning and personal-

care products. “We also have a fellow in Craftsbury raising local mushrooms.”

Buffalo Mountain does some \$1.4 million in sales, and stocks its shelves with pet food, CDs, and a variety of household and family products. Yet Gaillard sees niches that still remain to be filled by local providers. There is a paucity of Vermont products on the grocery side

of the store, and Gaillard would like to see a revival of the local canning industry.

With all the interest in local products and services, and conservation motives that at least partly underlie the movement,


Gaillard sees a connection with energy issues.

“Environmental issues have always been a concern of our membership,” says Gaillard, who volunteered at Buffalo Mountain Co-op from the very beginning and has been a co-op employee for 22 years. “People would accuse us of being Chicken Littles, but now with global

warming the sky IS falling.”

So, she says, the Hardwick food cooperative is looking for a role it can fill. The store sits in what Gaillard aptly describes as a “little shade pocket” on Main Street, where the sun doesn’t peek through the window until late afternoon. So ... perhaps solar panels on the roof? Perhaps not only setting that example, but vending solar panels for other local consumers?

“There’s interest along those lines,” she says. “There is a definite concern that our members have about local energy consumption. Let’s get beyond just operating the store.”

It’s the kind of energy (human, that is) that spurs people to imagine what they can do to invest their time and dollars at home, where it can do the most good and where the rewards are tangible. It’s also the kind of energy that Vermont’s original food cooperators displayed a generation ago, when they founded the co-ops that have grown to mean so much to their communities. 

*As the popularity of food co-ops has increased in recent years, so has their economic leverage and influence.*



The sun-dappled sign for the Plainfield Co-op (left) points the way to this hidden community treasure. At right, clerk Chris Jackson and Jenni Jenkins, one of a trio of managers, are busy behind the counter at this active and growing cooperative.



## Solar Hot Water System

continued from page 1

reduces Bob and Carolyn's fuel bill.

As an inveterate tinkerer – which is a characteristic fully on display in Bob's basement, a veritable jungle of "parts" seemingly of every device known to man – he clearly enjoys the technical aspects of the system. In fact, he pretty much designed it, after doing considerable reading and with coaching from his "mentor," Ed Butler of Sunrise Solar Services, Inc., in Randolph.

And here's the kicker: One of his favorite aspects of the drain-back system is that it uses water for a heating medium, rather than propylene glycol (also known as anti-freeze).

Some people might think you'd have to be nuts to install a water-based system in Vermont. Wouldn't the water freeze, expand, and crack the pipes and panels, when exposed to the cold weather and wind up on a roof? Aren't they better designed for Florida?

Well, here's why it works in Vermont. When there is not enough heat in the collectors to warm the water, it simply drains back down into the safety of the house.

Drain-back systems are "closed" systems that don't allow air inside the pipes (consequently, there's no rust). Winter or summer, the solar-heated water descends through Bob's house from the rooftop collectors to the big tank in the basement; it enters a little below its midsection, then loops down and around through the coiled tubing, heating water within the tank (which comes from the family's well).

And that – not the water in the closed

system, which continually re-circulates – is the family's hot water.

A wire connected to the solar array tells the thermostat on the small drain-back tank how warm the collectors are; the thermostat also reads the temperature of the available, cooled water within the closed system, and when there's at least an 8-degree differential it kicks into gear, pumping the cooled water back from the tank to the rooftop to be warmed.

When there is no solar advantage – at night, or on cold, overcast winter days – the system is idle, so there's no danger of freezing the water.

However, Bob has been surprised to learn how much solar advantage he can glean in the winter. The two solar panels are erected at a 60-degree angle on a roof with direct southern exposure. In the summer, Bob explains, the sun strikes the collectors "a glancing blow," which is plenty enough heat. In winter, due to changes in the earth's rotation, it's a direct hit.

"In the dead of winter it can easily get up to 75 degrees up there," he says. "And the panels function with snow on them. They pull heat through the translucence of the snow pack."

### 'Doing better' without petroleum

There are myriad reasons why Bob, a 59-year-old employee of the Vermont Agency of Transportation, bucked the New England trend and went with a drain-back, water-based solar hot water system. He recounts them, standing beside the equipment in his basement.

"For one thing, I do it for the reason anybody else would – for the earth," he says.

"Also a drain-back system is easier to



Bob Atchinson, with the tanks and apparatus that control his solar hot water system in Plainfield.

understand, and you don't have to bleed the system when you're making repairs. With a glycol system, you do. And guess where you have to bleed it?" His eyes glance upward, as if through the floors above him to the solar equipment on the roof. "At the highest point. I've had my days working as a chimney sweep. Everything can be done to service this system right down here."

But Bob sees still more advantages to a water-based system.

"Water has the best heat-transfer properties of any liquid," he says. "And water is cheaper [than glycol]. Water is not a petroleum product. I think we know where our soldiers are, and I think we can do better."

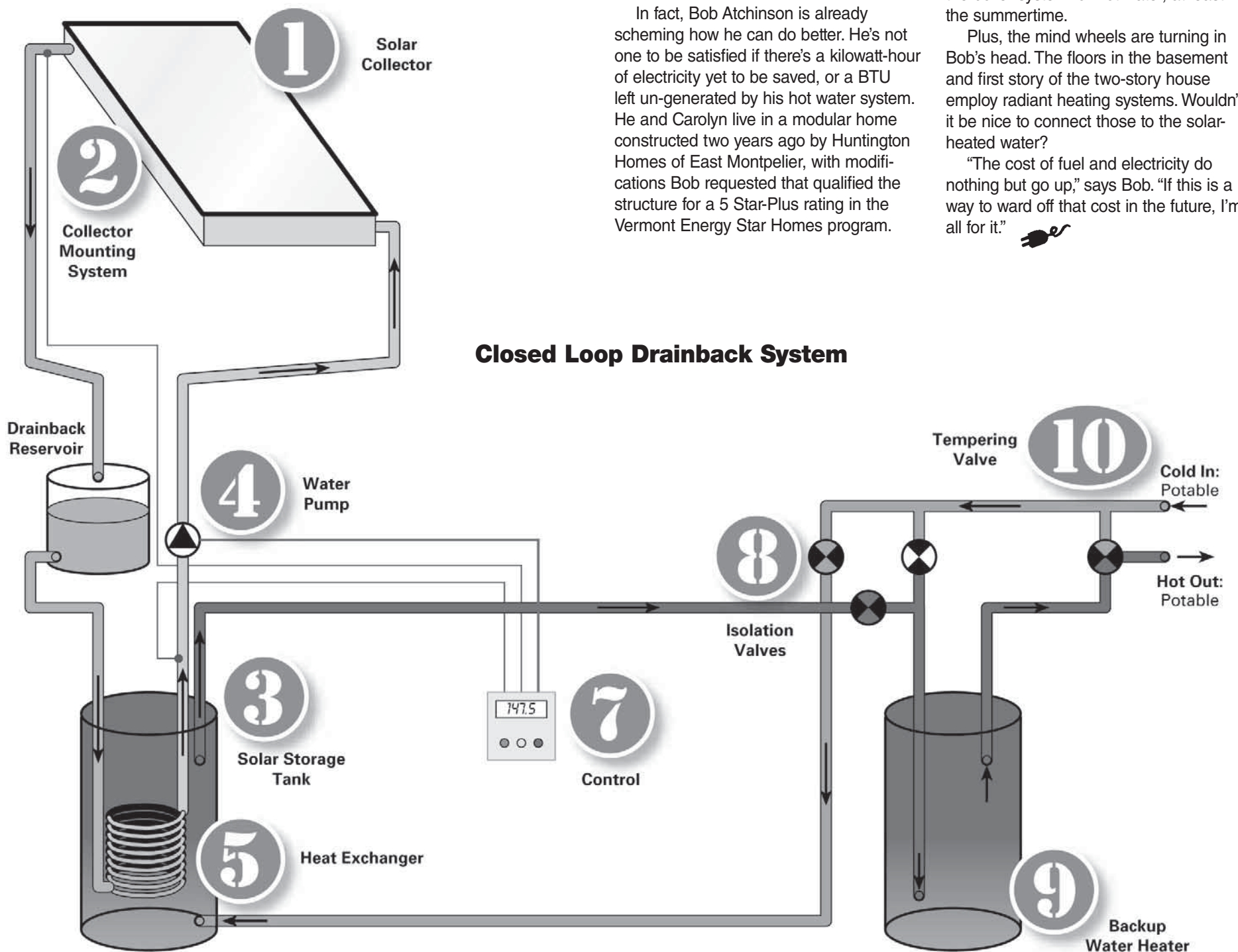
In fact, Bob Atchinson is already scheming how he can do better. He's not one to be satisfied if there's a kilowatt-hour of electricity yet to be saved, or a BTU left un-generated by his hot water system. He and Carolyn live in a modular home constructed two years ago by Huntington Homes of East Montpelier, with modifications Bob requested that qualified the structure for a 5 Star-Plus rating in the Vermont Energy Star Homes program.

That rating provided them an incentive-award return on part of their construction costs, saves on their operating costs every day, and attests to a very high level efficiency and conservation. They consume a mere 5 to 6 kWh per day, compared to the average WEC residential use of around 18 kWh a day. (Although Bob remarks, "I'd like to see it lower.")

So as the first anniversary of his domestic hot water system approaches – on November 5, which, Bob notes, is Guy Fawkes Day, the anniversary of Britain's failed but famous 1605 "Gunpowder Plot" – he's thinking of adding a third solar collector when spring comes. His goal would be to virtually eliminate any use of the boiler system for hot water, at least in the summertime.

Plus, the mind wheels are turning in Bob's head. The floors in the basement and first story of the two-story house employ radiant heating systems. Wouldn't it be nice to connect those to the solar-heated water?

"The cost of fuel and electricity do nothing but go up," says Bob. "If this is a way to ward off that cost in the future, I'm all for it."



Closed Loop Drainback System

# Sands and Singleton Join WEC's Line Crew

Washington Electric Cooperative has added two new line workers to its Operations Department, in hopes that they will have long and satisfying careers ahead of them.

Donnie Singleton, 31, of East Calais, and Kyle Sands, 32, of Montpelier, joined the Co-op's staff on October 1. Though already on the job, they will begin their formal training program in December. It takes five years of study and on-the-job training for an Apprentice Lineman to graduate to First Class Line Worker.

People interested in electric utility operations work, be they linemen or engineers, usually explain that they enjoy working outdoors, and Donnie and Kyle are no exceptions. Donnie, a 1993 graduate of U-32 High School, was employed for the past 13 years at National Life Insurance Company in Montpelier, doing grounds keeping,

general maintenance, welding and vehicle maintenance. He says he has been interested in working for the Co-op for some time, and has been looking for an opportunity to join the crew.

"I've heard nothing but good about Washington Electric for years," he says. "I like going around to different places every day, I like being outdoors, and I've just heard that this is a good place to work."

While learning the ropes at the Co-op, Donnie is also engaged in an even bigger job – building his own house, on Singleton Road in East Calais. He has finished the foundation and framing, and has been "doing more painting than I like to do," he says. House construction is hardly a one-man job; when he needs help he's able to find it, but, Donnie says, "What I can do, I do."

And, as on Washington Electric's line crew, what he can't do now he will learn to do.

## New everything

There have been all kinds of changes for Kyle Sands in the past two months. Kyle and his wife Zea's first child, Olivia, was born just two months ago; then, a few weeks ago, Kyle started a new job with Washington Electric Cooperative.

Kyle attended both Montpelier High School and Rice Memorial, graduating from the latter in 1993. He went to work in construction following high school, but has also worked at trail grooming and ski patrolling at the Sugarbush ski area. In the early years after school, Kyle sometimes spent his summers working in Corolla, on North Carolina's Outer Banks, both in construction and ocean rescue. More recently he has worked on construction crews framing new houses in the expanding areas of Waitsfield and Stowe.

But Kyle is a dad now, and a steady job with a solid company has its appeal.


And, Kyle says, "I've always thought that line work for an electric utility looked interesting, so I'm going to try it."

Says Dan Weston, WEC's director of operations and engineering, "They come to us with great mechanical aptitude, an attitude built around hard work, and an understanding of Vermont's weather. We'll take it from here. We'll train them to

be linemen. We are glad to have Kyle and Donnie on board."

Donnie Singleton and Kyle Sands rolled back to the Co-op warehouse in WEC's utility trucks on a recent workday afternoon, posed for photos for Co-op Currents, and said things were going well so far and that they enjoyed their new co-workers.

That's good, because on some cold, stormy nights in the winter ahead of us,

while WEC members are safe inside their homes, Donnie and Kyle will be out in the dark working as a team with those men, depending on each other to solve problems, get the work done well and efficiently – and not least of all, to keep each other safe. 



Kyle Sands



Donnie Singleton

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# Light At The End Of The Tunnel

*New Era of Laws and Technology Could Change Our Lighting Future*

**F**ar be it from *Co-op Currents* to predict the demise of the incandescent light bulb. But as the world confronts global climate change, and as homeowners and businesses come to grips with the fact that electricity is never going to be cheap anymore and that energy conservation is a moral obligation we have to each other, the “traditional” light bulb may be in peril. Its rival, the compact fluorescent light bulb (or CFL), is looking better all the time. And there may be further competition in the wings.

Big changes sometimes are brought about by legislation, and therein may lie the fate of Thomas Edison’s 125-year-old filament bulb. Proposals have begun to surface on the federal and state levels in the U.S., as well as internationally, that would either ban incandescent bulbs or force them to become more efficient.

State legislators in California, New Jersey, and Connecticut have proposed such measures, and a bill has also been introduced in the U.S. House of Representatives. Last February, Australia announced it would phase out bulbs that do not meet efficiency standards, and comparable legislation has been mentioned in the United Kingdom. Cuba began phasing out incandescent bulbs two years ago amidst concern about the island’s limited electrical capacity, and

Venezuela’s government has announced that it will distribute millions of energy-saving bulbs to the country’s citizens.

In the U.S., however, an even better indication that today’s incandescent bulb could be on its last legs is that the industry itself is showing signs of turning its back on the old standby. According to a report from CNSNews.com (Cybercast News Service) earlier this year, “Philips Lighting, the world’s largest producers of light bulbs, has joined with environmental groups to encourage legislation banning incandescent bulbs.”

Why would a company seek to ban one of its own products? Conjecture in the CNS story was that the profit motive, rather than environmentalism, was at work. Philips also produces energy-efficient bulbs that cost more than its, or anyone’s, standard incandescent. The news service quoted a Philips spokesman as saying, “If we stopped [producing the incandescent bulbs] . . . somebody else would just jump into the breach and fill that gap. Given the choice of a 25-cent incandescent [compared] to a \$2 or \$3 or \$5 product... Consumers have made



that choice already over the years. They choose the more inefficient type, so here we need to lead them a little by the hand and take those inefficient types off the market.”

Having government “disappear” them would conveniently steer the buying public toward Philips’ product. Philips, however, rebutted those

who were skeptical of its motives. The company spokesman said that while energy-efficient bulbs might cost more, they also last longer, attracting fewer sales.

But there may be another wrinkle to this corporate gamesmanship. General Electric, a Philips competitor, is working to develop a more energy-efficient incandescent bulb. Not all of the legislation being talked about would ban incandescents per se; an alternative approach would be to set mandatory standards of efficiency and let industry and the marketplace determine how those standards are met.

So could Philips be trying to head GE off at the pass, by persuading lawmakers to go in the direction of banning incandescents?

The California bill – called the “How Many Legislators Does It Take To Change A Lightbulb Act” – was introduced last winter by State Assemblyman Lloyd Levine. It would ban incandescent bulbs by 2012.

The Connecticut bill, also introduced last winter, was simply called “An Act Concerning Inefficient Incandescent Lamps.” It would authorize the state Commissioner of Environmental Protection to create a list of inefficient incandescent lamps and place them on a “do not sell” list, giving retailers a year to sell existing stock. Democratic State Rep. Elissa T. Wright, one of the four authors of the bill, said, “In the face of rising energy costs and power-supply issues, replacing a standard light bulb with a more efficient compact fluorescent (CFL) or next-generation light emitting diode (LED) is one of the easiest things consumers can do to cut electricity costs, energy usage, and greenhouse gas emissions from power plants. If everyone in Connecticut were to replace just one standard light bulb . . . the amount of energy used in lighting in Connecticut would be reduced by the equivalent of 250,000 homes.”

Meanwhile, in the U.S. House of Representatives, Rep. Jane Harmon (D-California) attacked the problem by proposing mandatory efficiency standards that all bulbs would have to meet by a date certain. Quoting again from CNSNews.com, “Harmon’s bill would require all bulbs to produce 60 lumens-per-watt (a measurement of the bulb’s lighting output) by January 2012; 90 lumens-per-watt by January 2016; and 120 lumens-per-watt by January 2020.”

The standard incandescent bulb emits 12 to 15 lumens-per-watt. A GE press release last winter said the company

was developing a bulb that would burn at 30 lumens-per-watt – double the current efficiency, but only half the efficiency prescribed by Harmon’s House bill. GE indicated these bulbs might hit the market by 2010.

## Bird in hand

If incandescent bulbs could be designed to burn less electricity, would there still be reasons to prefer CFLs? Actually, the field could tilt toward incandescents – if (a big if) their energy efficiency was considerable improved.

Michael Russom, retail efficient products manager for Efficiency Vermont (EVT), said that several considerations would come into play.

“CFLs lose efficacy in the cold,” Russom pointed out, “whereas the incandescents we know now do not.

“CFLs have mercury,” he added. (The EPA has estimated that about 4 percent of the mercury entering landfills is attributable to fluorescent bulbs. Some states, however, prohibit the landfill disposal of CFLs, and Vermont is one. See “Safe and Legal Disposal of CFLs” for advice on disposing of or exchanging CFLs.) Incandescent bulbs, on the other hand, are comparatively benign, consisting of a vacuum in a glass envelope, with a tungsten filament and a metallic electrical contact (brass or brass alloy) in the base.


Advantage: incandescents.

“But the other questions are cost and life,” said Russom. “We don’t know how much GE’s new product would cost and how long they are going to last. Are they going to have the one-year lifetime of today’s [incandescents] in normal use? The CFL’s typical life is seven years, in a proper application.”

How these factors would balance out remains to be seen. But here are some facts about CFLs, gathered primarily from the Internet site Fast Company, that argue persuasively for WEC members to convert their lighting to compact fluorescents. A \$3 “swirl” (the corkscrew-looking compact fluorescent bulb that fits in standard light sockets) pays for itself, in electricity savings, in five months – but could last another 90 or even 125 months. If every American household (Fast Company says there are 110 million of them) replaced just one – ONE – 60-watt incandescent bulb with a CFL, it would save enough electricity to provide power for all the homes in Delaware and Rhode Island.

“In terms of oil not burned, or greenhouse gases not exhausted into the atmosphere,” Fast Company says, “one bulb is equivalent to taking 1.3 million cars off the roads.”

CFLs do cost more, but that difference can be reduced by using the coupons Efficiency Vermont distributes conveniently statewide. And we need to be careful how we handle them, and how we get rid of them after they have burned out.

But these really aren’t significant challenges. And until, or unless, the lighting industry provides us with vastly more efficient incandescent bulbs, one might argue that we owe it to ourselves and each other to make the switch. 

## Safe and Legal Disposal of CFLs

**C**ompact fluorescent lights (CFLs) save users serious money on their electric bills, and could significantly reduce America’s energy consumption, pollution, and greenhouse gas emissions if more people used them. Wouldn’t it be perfect if they contained absolutely no mercury?

But they do – in “trace” amounts, so that means they must not be thrown in your household trash when they burn out – which can take seven to 10 years. Fortunately, disposing of them correctly, safely, and legally is not such a big deal. Efficiency Vermont (EVT) and the state’s solid waste management districts have instructions on their websites to guide people through the necessary, but not particularly onerous, tasks.

EVT keeps things in perspective by pointing out the following about mercury. “By using CFLs you actually reduce mercury pollution, by lowering the demand for electricity from power plants that emit mercury. A fossil fuel-fired power plant typically will emit 10 mg of mercury to produce the electricity to light an incandescent bulb, but only 2.4 mg to light a CFL for the same amount of time.”

The difference, of course, is that the mercury-emitting power plant is somewhere “over there,” and the compact fluorescent bulb is in your home. However, a CFL contains about one-fifth the amount of mercury contained in your watch battery, and unless you break the bulb you won’t be exposed.

So what if you do break the bulb? EVT’s website provides instructions for how you should clean up the casing and powdery residue. When handled properly a broken CFL is not a threat so much as a nuisance. The instructions are easy to follow. Whether you’re disposing of a container of CFL pieces, or an intact CFL bulb, Vermont law prohibits these products from going into the state’s landfills. As Vermonters, we all live within solid waste management districts, and those districts provide instructions for the safe and legal disposal of compact fluorescent bulbs. The districts serving WEC’s territory are the Central Vermont Solid Waste Management District, the Lamoille Solid Waste District, the Mad River Solid Waste Alliance, and the Northeast Kingdom Waste Management District. Find their websites on the Internet, or call them (they are listed in the phone book) for advice.

The most convenient way to dispose of burned-out CFLs is by taking them back to the hardware store where you bought them – you’ll be shopping there to replace them, anyway – if (a big if) the store is a participating ACE or True Value Hardware store. Participating stores provide free recycling. If you shop at an ACE or True Value, ask the staff if they participate

“Vermonters should appreciate that these stores are providing that service,” says WEC General Manager Avram Patt. “It makes the process incredibly easy and convenient. We can thank them by doing business with them. And for other stores, it could be an encouragement to them to provide the same kind of service.”

## MARKETPLACE

**For Sale:** Gould shallow-well water pump, complete with approximately 50 feet of PVC piping, foot valve, and fittings. Asking \$150. Telephone: 802-836-2776.