



CO-OP LITE



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Member Newsletter

The REDONA Project

By Dave Hallquist, CEO

Vermont Electric Cooperative, Sealander Waterworks from Washington, D.C., and ENERKEM from Sherbrooke, Quebec, have formed a partnership that will develop, test, and market a turnkey one megawatt gasifier – generator – heat recovery unit that would be used for distributed on-site generation combined with district heating and cooling. The research work will be fully funded from Canadian and American grants and no costs will be incurred by VEC's members. The project is called Renewable Energy Development of North America (REDONA) and this new venture will be operated separate and independent from VEC.

Sealander Waterworks acquired the Union Butterfield complex that straddles the border between Derby Line, Vermont, and Stanstead, Quebec. Sealander Waterworks is a company that is owned by Evans Sealander, a real-estate investor whose family is in the global fruit and vegetable business. Sealander has a goal to develop a renewable energy research facility. Sealander recognized the importance of the Union-Butterfield location because it is one of the few places in North America that straddles the United States and Canadian border. The facility is located in the Northeast and has easy access to Montreal and the US Interstate highway system.

ENERKEM is a company that was founded by Esteban Chornet, a long-time professor at Sherbrooke University. ENERKEM Technologies Inc. focuses on bringing technologies to market which produce energy and fuels from biomass (forest and agricultural residues) as well as from waste products such as municipal solid wastes, non-recyclable plastics and residual streams from oil fields and refineries. Converting these "low grade feedstocks" into usable energy (gas, electricity, steam or liquid fuels) creates a source of added value and becomes a significant

technical and economic breakthrough from a commercial and environmental point of view. Chornet was born in Spain and his family owned a lumber mill that ran on a gasifier. Chornet has worked on gasification his entire adult life.

The cost of electricity has increased 123 percent over the past few years. What is driving this increase is the rising cost of fuel. The Northeast power supply market is highly dependent on natu-



ral gas, whose market price tracks closely to the price of oil. Even though short-term oil prices have come down somewhat from their high in 2006, investors, energy providers, and researchers agree that the long-term outlook for oil is bleak. India and China, with their combined population of over two billion people, have a growth in Gross Domestic Product (GDP) of greater than ten percent. This places a huge demand on available energy resources. In fact, China has purchased most of the rights to the Alberta Tar Sands, one of North America's greatest oil reserves.

Vermont imports 65 percent of its electricity. VEC currently purchases all of its electricity. About 38 percent of this electricity comes from Hydro-Quebec, and 15 percent comes from Vermont Yankee. The Hydro-Quebec contract starts expiring in 2012. Vermont Yankee is scheduled for shutdown in 2014 although an extension has been requested. While Hydro-Quebec will consider a long-term contract with Vermont, it will likely be at market prices. These factors suggest that unless Vermont develops its own generation, it will be at the mercy of the markets. These markets are expected to continue to significantly rise in price which will directly impact electricity rates as nearly three-fourths of our cost of service is power supply and transmission.

The cost of generation is driven by two primary factors; the cost of fuel and the cost of construction. The idea behind the REDONA project is to develop a standardized generator that can be produced in volume. Most generation projects built today are custom projects; the generator, the facility, and the permitting are different for each. Since REDONA will produce the same unit each time, replacement parts will all be standard, engineering is the same, and site development and permitting will be uniform. This should drive the cost of implementing the generation project down to at least one-third of the cost of a custom project. Permitting should be straightforward because each site footprint is the same.

The cost of fuel will be driven down by the process of gasification. ENERKEM Technologies' gasifiers allow the use of multiple fuels, and REDONA will introduce additional fuels and processes for generating energy. Gasification also is about twice as efficient in energy conversion than traditional burning.

Gasification occurs when a feedstock (wood, straw, municipal solid waste, sewage) is placed into a high temperature (1440 degrees Fahrenheit), oxygen starved chamber. Instead of burning, the feedstock simply breaks down to a simple gas (CH₄), which, in the REDONA project, is then passed along to another chamber where it is cleaned up to be used to run an engine to produce electricity. The REDONA gasifier is emissions-free and carbon-neutral. Gasification has been around for at least 200 years. During World War II there were over a million gasifiers world-wide. Gasification fell out of use in the United States during the 1950's, when oil became a less expensive resource for generating energy.

Gasification has the potential to help North America produce its own renewable fuels in a way that maximizes the energy potential of energy crops (carbohydrates). Gasification is significantly more efficient than bio-fuel and

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ethanol production in converting a crop to energy in stationary applications. Gasification technology has developed to the point that it is now commercially feasible to produce turnkey units that can be distributed throughout North America.

Any carbohydrate can be run through a gasifier to produce energy. Initially the project will start with wood as a fuel source to develop a fuel standard. The feedstock will be compressed and turned into pellets to create a uniform fuel mixture with standard heat (BTU) content. Once the standards are developed, other carbohydrates can be introduced to develop a recipe. These fuels can include such raw materials as soy, switch grass, corn stalks, and sewage sludge. Pellets also have the advantage of high levels of volumetric efficiency and do not decompose easily.

The energy research facility plans to install three, one megawatt gasifiers at the site. These gasifiers will produce heat to be used by Tivoly (located in the Union Butterfield complex) in their manufacturing processes as well as district heating and cooling for the energy research facility, and electricity to be supplied to Vermont Electric Cooperative as power supply for our members. Revenues from the sale of the energy will be used to standardize the processes for production units. It is envisioned that once refined, a fourth unit will be installed by Vermont Electric Cooperative for commercial generation at a facility such as



Smugglers Notch Resort. This would be a commercial reference site with high financial, environmental and customer standards.

The energy research facility will also perform a region-wide analysis of fuel sources. The northern forests and farms in Maine, New Hampshire, Vermont, New York and Quebec will be evaluated in terms of their capability to produce fuel using sustainable practices. Standards and certification processes will be

developed and used as part of the fuel purchasing process. Developing the infrastructure from the forest and the farm to the generator will be a key part of this project. Loggers and farmers could share the costs of common equipment, such as chippers, harvesters, and pelletizers, through a cooperative model.

VEC has high hopes for the REDONA project. Vermont does not have many options for generation. The transportation costs to move fuels are expensive. The costs to construct transmission facilities are rising at rates much higher than inflation, and Vermonters do not want to see their landscape cut up by transmission corridors. Transmission only enables electricity to be brought in from other areas. It does not drive down the cost. The answer is to develop alternative fuels from local and renewable resources. We believe REDONA will have the technology to enable this development. ☼

☎ For more information regarding the **REDONA** Project please call 802-730-1155.

CVCLT Green Mountain Loan Fund

The NeighborWorks® Homeownership Center at the Central Vermont Community Land Trust (CVCLT), an affordable housing nonprofit organization located in Barre, wants to make members of the Vermont Electric Cooperative (VEC) aware of the **Green Mountain Loan Fund (GMLF)**, an affordable home repair loan program which began in May, 2006. The GMLF allows low- and moderate-income homeowners throughout Lamoille, Washington and Orange Counties to perform critical health and safety upgrades to their homes, including weatherization, lead abatement, and access modification.

CVCLT staff works closely with interested borrowers to determine program eligibility, establish a scope of work for their

repair project, obtain bids from contractors and monitor construction, while also providing affordable loans to pay for the work. In Lamoille County, CVCLT works in partnership with two local housing organizations, Lamoille Housing Partnership and Champlain Housing Trust. This particular rehabilitation program applies only to the Lamoille County members of Vermont Electric Cooperative; members in other areas of the Co-Op territory should contact their local community land trust organization for details on the availability of similar programs.

If you have questions about the **Green Mountain Loan Fund**, or would like to receive more information, please contact Garrath Gorton at (802) 476-4493 Ext. 215.

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“Ask Rachael”

Q. Our last electricity bill was five times higher than normal. We haven't bought anything new that uses electricity. We've always had an electric water heater and electric appliances. What could be going on?

A. Did you have visitors? Additional showers and loads of laundry increase hot water use. No visitors? Then see if your water heater has a malfunctioning heating element or control or has a leak. Also, check any pumps. Pumps are used for swimming pools, private water systems and some sewer systems. A faulty pump, control, pressure tank, or a water leak in the system could cause the pump to run more than it needs to. If it's still a mystery, give Efficiency Vermont a call at 1-888-921-5990 for more help.

Rachael is a business development specialist at Efficiency Vermont. To find more energy saving tips or to submit a new question about energy use in your home or business, visit www.efficiencyvermont.com/askrachael or call, toll-free: 1-888-921-5990 to speak with a customer service representative.

