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## Vermont jumpstarts 'green fuel' use

By Candace Page  
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In Winooski, entrepreneur Scott Gordon turns vats of used restaurant grease into fuel for customers' backhoes, bulldozers and furnaces, at the rate of 200 gallons a week.

In Williston, householders Jim and Lucy McCullough heat their 13-room, 1796 brick home with a mix of soybean oil and petroleum.

Alburlg farmer Roger Rainville planted rapeseed, the source of canola oil, as part of a study to determine if Vermont farmers can grow their own tractor fuel.

Next month, Norman Prive, owner of Lamoille Valley Transportation in Morrisville, will switch his fleet of 14 buses to a mixture of cleaner-burning vegetable oil and diesel fuel.

"I have 12 grandkids growing up in this world. It would be nice when they are my age if the environment is still livable," Prive said.

Prive, Gordon and their fellows are part of a small explosion of interest in Vermont in burning biofuels, commonly referred to as biodiesel. The vegetable-based oils can run diesel engines and home furnaces either in their pure form or mixed with fuel refined from petroleum.

Choose the reason -- rising oil prices, federal tax incentives and grants, personal commitment to environmental protection -- but the sale of biodiesel blends in the state has climbed from 9,000 gallons in 2003 to a projected 1 million gallons this year.

That's still a tiny slice of the 280 million gallons of diesel-type fuels burned each year in Vermont. Substantial obstacles stand in the way of continued growth, including the higher price of biodiesel and its tendency to congeal in cold temperatures among.

Nevertheless, enthusiasts see a bright future as petroleum costs rise. Fuel made from soy, rapeseed and mustard is a renewable, U.S.-grown resource that produces less pollution and reduces dependence on foreignoil, said Netaka White, executive director of the Vermont Biofuels Association.

Most exciting, he said, is the prospect of producing some of the fuel burned in the state from crops

grown on underused Vermont farmland.

"The idea is Vermont could produce 5 percent of its fuel, or 14 million gallons, by 2020," he said. That would require about 140,000 acres of farmland, about a third as much land as farmers now devote to hay and silage, he said.

"We want to do the whole thing on the farm, so the farm could have its own system," said Rainville, the Alburg farmer. "We think this is cost-effective when regular fuel goes up to \$2.50 or \$3 a gallon. There's a need; there's no question about that."

Part of a \$496,000 federal grant will jump-start on-farm experiments this year in which farmers grow oilseeds, refine them into fuel, then burn the fuel in their farm equipment.

A cleaner ride

Vegetable oils and animal fats can be turned into fuel by a refining process that strips out glycerin. The resulting fuel is essentially indistinguishable from diesel and No. 2 home heating oil, but produces less air pollution when it is burned.

Pure biodiesel cuts carbon monoxide and particulate emissions in half, for example. Only one pollutant -- nitrogen oxide -- increases slightly.

Engines and furnaces don't have to be altered to burn the biofuel.

"We've never had a problem," said Mike Altman, who manages the fleet of eight campus shuttle buses at the University of Vermont. "If you were driving the bus, you wouldn't know the difference." The buses have burned B20 -- a mixture of 80 percent regular diesel, 20 percent biodiesel -- since September.

At Smugglers' Notch ski resort in Jeffersonville, B20 biodiesel runs the company's service vehicles, snowblowers, lawnmowers and the like. Soon, with the help of a subsidy from a federal grant, the fuel will power the snowmaking system.

Operations Manager Tom McGrail particularly likes using the fuel to reduce the pollution breathed by children who ride a haywagon pulled by a tractor to their ski-school lessons.

Like UVM, Smugglers' uses biodiesel as part of a broader effort to operate in an environmentally friendly way.

That's Prive's motivation, too. He is converting his Lamoille Valley fleet -- nine motor coaches and six school buses -- to biodiesel as a personal contribution to improving the planet, he said.

"We know about the pollution that hasn't been controlled. It's time we all do our share, even if it isn't a big thing," he said.

Burning biodiesel can be a marketing tool as well. At UVM, the fuel is part of the school's image-building as a leading "environmental university." At Lamoille Valley Transportation, charter coordinator Paul Provost looks for a boost in business.

"We have some groups that want to go with an environmentally friendly company when they

charter a bus," he said. UVM's Tourism Data Center has proposed creating a "green coach" certification program companies that burn alternative fuels in their buses.

### Supply troubles

Prive's coaches are running this month on standard fuel. His fuel distributor has not worked out supply problems. That's one challenge to increasing biodiesel use.

Another is the nature of the fuel itself. Biodiesel thickens and eventually coagulates like molasses when the temperature drops. Although most diesel equipment and home furnaces can run on B100 -- pure biodiesel -- that's difficult-to-impossible during Vermont winters.

That's one reason Paul Ralston of Vermont Coffee Roasters in Bristol commissioned a custom-built roaster that will burn pure biodiesel. His investment encouraged a local fuel dealer to install a B100 storage tank indoors, he said, where the fuel can be kept warm.

"The whole idea is that this is the future," Ralston said. "We need to solve the infrastructure parts so it is easier for the next guy who wants to use the fuel."

The strategy of the Vermont Biofuels Association and the state Sustainable Jobs Fund has been to help institutions with fleets of vehicles make a commitment to biodiesel, through grants that help cut the cost of the more-expensive biodiesel. That creates a market for dealers like Champlain Oil in Burlington and Patterson Fuels in Richmond.

Once the dealers have a supply of the fuel, they can make it available to retail pumps, as Patterson Fuels does at service stations in Richmond and Charlotte. The two outlets are selling about 800 gallons a week of biodiesel, Patterson Fuels co-owner Jason Harvey said.

Light demand -- though the two Chittenden County outlets sell biodiesel for the same price as regular diesel -- may discourage expansion.

Champlain Oil had a biodiesel pump at a gas station on Shelburne Road for a time, but took it out when it did little business, said President Tony Cairns.

Biodiesel home heating fuel remains more expensive -- about 13-cents a gallon more last week. McCullough, a state representative and operator of Catamount Outdoor Family Center recreation area, said he is willing to swallow the extra cost, though his drafty, 212-year-old home swallows 3,500 gallons of fuel a year.

"The major reason is we feel it protects the environment by lessening the amount of fossil fuels that get burned," he said. "We are facing a planet with major problems."

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