

**Car fueled by leftover
vegetable oil takes a load
off the environment**

By Suzanne Hurt

Grease Lightening

If you spotted Paul Rempen Jr. tooling his Mercedes-Benz around Elk Grove, you might think the car was just another gas-guzzling dinosaur. But underneath the sedan's pale yellow exterior, there's a revolution going on.

Rempen converted the 1982 Mercedes-Benz 300D Turbo Diesel into a dual-fuel vehicle that can run on vegetable oil in addition to standard diesel. Rempen says alternative-fuel vehicles like his, which uses leftover vegetable oil from restaurants, could help break the addiction to fossil fuels.

"We take it for free and recycle it to fuel our cars, and it's cleaner for the environment. It reduces our dependency on Middle Eastern oil. What could be better?" says Rempen, a 46-year-old ranch caretaker. "It's really a win-win situation for everybody except for big oil."

Biofuel — fuel made from recently derived plant material — is being pursued by Americans tired of the pollution and high cost of fossil fuel gasoline. The fuel can only be used in diesel engines.

Paul Rempen Jr. collects used oil from local restaurants to fuel his yellow 1982 Mercedes-Benz. He says the car's exhaust gives his girlfriend the munchies.



Photos: Bill Mahon

If the buzz on the blogosphere is any indication, the number of people using bio-fuel, also known as veggie fuel, is growing. Rempen took on the project last fall after his dad, Paul Rempen Sr., and friends meeting for their weekly lunch wondered whether it would really work. Now Rempen Jr. is so into his "veggie car," he's developing a business to help other people make the transition.

Veggie fuel is related to biodiesel, but they're not the same thing. Biodiesel is made by running vegetable oil or animal fats through a chemical process that separates glycerin from the oil and creates methyl esters, which are then labeled biodiesel.

The fuel Rempen uses requires a simpler, chemical-free process; he takes waste vegetable oil, or WVO, from a restaurant, filters it twice, and heats it to remove water.

And yes, the exhaust does smell like French fries. Or Chinese food. Or whatever was cooked in the oil. But only when the car stops. Rempen says he likes it. "My girlfriend, it makes her hungry all the time. She gets the munchies."

Both biodiesel and WVO fuel can be homebrewed using non-hydrogenated oil made from soy, canola, peanuts, corn and rapeseed. Rempen's worked out agreements with restaurant owners to cart away used

cooking oil for free, an arrangement that saves the restaurateurs money. Otherwise, they pay to have the grease removed by rendering companies that reuse it to make animal feed and other products.

"Some of what we're eating is recycled grease that ends up in feed and then it gets back into our food chain," Rempen says. He adds that vegetable oil from Asian restaurants is better for fuel than leftover French fry oil because it's changed more often and is therefore cleaner.

But if the whole collection and filtration process sounds too complicated, Rempen says there's another option that's still



Rempen built his own low-tech filter system, shown here, using old blue jeans and a 55-gallon drum.

cheaper than petroleum: straight vegetable oil, or SVO, right from the store. “When I run low on WVO sources, I run up to Costco. Right in the parking lot I pour it into the tank,” he says. “People look at me like, what are you doing?”

However, SVO/WVO fuel isn’t technically legal in the United States yet. That’s why Rempen uses a dual fuel tank system, with diesel as the primary fuel and WVO for demonstration purposes only. “The law hasn’t caught up to us,” he says. “Nobody really knows what to do.”

He questions why SVO/WVO isn’t a legal fuel and adds, “The problem is politicians say we need alternative fuels so we can get away from our addiction to oil. But there are obstacles to doing it.”

Biodiesel meets industry specifications as a legal fuel registered with the U.S. Environmental Protection Agency, according to the National Biodiesel Board, a trade association created in 1992 by soybean commodity groups now partnering with feedstock-processor organizations, biodiesel suppliers, fuel marketers and distributors, and technology providers.

SVO/WVO is said to burn cleaner than biodiesel, and its production doesn’t require harmful chemicals like lye, Rempen says. Another difference between SVO/WVO and biodiesel is that using the former requires minor modifications to the fuel system, while biodiesel requires none.

Older diesel engines, including those on Mercedes-Benzes, take the conversion well, says Rempen, who worked as an auto technician for 20 years. He bought a conversion kit for about \$850, and in two days converted his Mercedes into what some people call a grease car. He added a second fuel tank in the trunk, ran fuel lines to

the engine, installed a heated fuel filter and mounted two switches on the dashboard. He says he could now convert a car in a day. Labor to install the kit would cost another \$800, says Rempen.

Now he's developing a business for other interested drivers. He's working on producing a simpler-to-install, less-expensive conversion kit for warmer climates like California, as well as clear, easy-to-follow instructions. He also expects to offer installations and classes on collecting and filtering oil. He'd like to share what he's learned from the mistakes he's made with his first converted car.

Rempen says converting a car or truck and collecting and filtering vegetable oil

Older diesel engines, like the one in Rempen's Mercedes, are easy to convert into dual-fuel vehicles that can run on diesel and biofuel.



are safe. "It's very simple. There are a lot of people out there who are saying it's dangerous. It's not true."

Drivers can buy ready-to-use filtration systems for approximately \$800, Rempen says. He built his own low-tech filter system in the garage for \$200. His system uses old blue jeans to filter oil into a 55-gallon drum. To separate water from the oil, Rempen then

heats the oil in the drum using a water-heater element available at any hardware store for about \$15. When water collects at the bottom of the drum, he opens a valve and drains the water off until oil starts to drain. Then, to remove any remaining debris, he pumps the oil through a whole-house water filter — the kind used under a kitchen sink and available for \$30 to \$75.

Rempen estimates it would take half a day to collect and filter enough oil for a month of driving. He says vegetable oil-fueled vehicles are right for anyone willing to spend the time to collect and filter vegetable oil.

"The problem with the American people is that we're lazy, and we just want to pull up to a pump and just pump oil," he says. "It's like fast food. We don't want to cook food; we just want to pull up and get food right away."

Through Internet research, Rempen discovered just how big this alternative fuel source is becoming. "It's huge," he says. "There's a whole world out there." However, he adds that veggie fuel alone can't solve the problems associated with fossil fuels because there aren't enough diesel-engine cars or WVO.

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— Paul Rempen Jr., biofuel pioneer

Rempen plans to ask the Elk Grove School District to consider running buses on either SVO or WVO. He won a grant from San Jose's Huguenin Rallapalli Foundation, led by philanthropist Kris Rallapalli, to create a proposal and a conversion kit for one bus. Rempen would make the conversion for free.

His experience has been so good, he's about to convert another Mercedes. That means he has a tasty little car for sale to the right owner. "In these times, with our dependency on oil and the pollution, it's an alternative we all need to look at," he says. "You see on the news every day people saying, 'We need alternatives, we need alternatives,' and I have one here that's ready to go." □

Paul Rempen Jr. can be reached at pauljr@cwnet.com. Another Sacramento convert who started a veggie-fuel business is John Lucas. His company, Fattywagons (fattywagons.com), sells hard-to-find components for conversions.