

BATHTUB BIODIESEL

Team of OSU students brews up a batch.

BY MELISSA BEARNS

Deep in the bowels of OSU's chemistry building under the glare of fluorescent lights, the reactor motor hummed softly from inside its veil of clear plastic, wood and metal. Big blue water cooler bottles filled with a sludgy looking black liquid surrounded the machine.

Brothers Kevin and Pat Marnell, Nick Winlund and Ryan Hodges stood back surveying their work. They didn't seem to care much about the environmental implications of what they're doing: creating a renewable fuel source that might eventually free us from our reliance on foreign oil. Sure, that's an added bonus. They all say part of their interest in the project is that it's environmentally friendly. But most of them are chemistry students, and as Hodges put it, "I'm really just interested in the process of turning grease into fuel."

Along with about 30 other OSU students, they're part of the OSU Biodiesel Initiative. The group received a \$10,000 grant from the EPA, and soon they'll head to Washington, D.C., to compete with other university students for an additional \$75,000.

Funding for the project comes from the grant and the OSU Chemistry Department.

Local businesses and community members have donated many of the supplies, including the oil and grease. In earlier experiments, the chemists used grease from local restaurants, including the Burger King on campus.

"Check this out," Pat Marnell said, walking around to the back of the reactor and pointing to a 55-gallon metal drum filled with canola oil. On the top, written in black marker, is the address to the OSU Biodiesel Initiative. "Somebody addressed a steel drum and mailed it to us!" David Hackleman, who teaches chemical engineering at OSU and is also the faculty advisor for the OSU Biodiesel Initiative, later explained that a local farmer who wanted to support the project sent four full drums, or 220 gallons of canola oil to the biodiesel team.

For months the project had been on hold. Manufacturing biodiesel creates fumes that are dangerous to breathe in high concentrations. So the last step was building a fume hood, a structure that surrounds the reactor with thick, flexible plastic walls. A hole in the top connected to duct work allows the fumes to escape.

Outside the fumes react with the humidity in the air and break down into tiny

droplets of alcohol and lye. This small-scale operation creates little waste. "Compared to a petroleum refinery, the biodiesel process is incredibly benign," Hackleman said. Another byproduct of the process is glycerin. "That's a pretty valuable product," Pat Marnell said. "We want this whole process to be 100 percent sustainable, so we're looking for ways to sell or use [the glycerin]."

The students recently finished constructing the fume hood. Over spring break, the Biodiesel Initiative production team brewed up their very first batch of fuel. Starting with 25 gallons of oil, the team produced about 18 gallons of biodiesel. When they perfect the process, Kevin Marnell said, they expect a one to one ratio: One gallon of oil will produce one gallon of biodiesel.

To make it, they mix lye with methanol to make sodium methoxide, then mix that with the oil and let it simmer. If they heated it, speeding up the chemical process, it would take about an hour. "But it took us about three days, because we have to work [at jobs and school]," Kevin Marnell said.

Once this reactor is up and running smoothly, the

next step is to build a bigger reactor capable of producing about a tanker truck full of biodiesel a week, about 4,000 gallons. Ultimately, the team hopes to set up a distribution station and start selling the fuel.

"This is an alternative fuel that can be recycled yearly," Kevin Marnell said. "It's a way out of the petroleum cycle." **EW**



Members of the OSU Biodiesel Initiative's production team stand behind their biodiesel reactor.

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