

First portable biodiesel production system fit for a pickup truck

By [Rebekah Frank](#), Reporter | Sunday, October 25, 2009 8:09 PM

St. Thomas students and their professor have designed the first portable biodiesel production system, which can fit in the back of a pickup truck.



Generation One, a biodiesel production system, can fit in the back of a pickup truck and could possibly fuel St. Thomas' shuttle buses.

“Other companies were trying to get this done and we got it done in a year before they did,” said graduate student John Gorman, who worked on the system last year. “Before they got funding, we finished the project.”

The system will mainly be used for humanitarian purposes, junior Kelsey Hofmeister said.

“Our main goals are to help farmers and bring it to poor countries,” Hofmeister said.

The system converts plant and animal oils as well as alcohol into biodiesel. It also converts much better than previous systems, said Greg Mowry, engineering professor.

“No one has ever successfully made a portable biodiesel system of a 4,000 to 7,000-gallon-a-year volume before,” he said. “Something with this capacity addresses farms, humanitarian applications, and is sufficient for significantly impacting home use, as well as university bus use.”

Mowry and most St. Thomas students involved in the project said they hope the portable biodiesel system may be used in the future to power St. Thomas shuttles by using alcohol and left-over oils or fat from the cafeteria.

The system would also be good for educational purposes, Hofmeister said.

“I feel it is important for students to learn and understand the process of biodiesel production because energy consumption is such a huge deal,” she said. “You can’t just grow fossil fuels.”

How it started

Mowry became involved in biofuel research and development after doing power systems work for a hospital in Tanzania three or four years ago. A non-government organization requested a sustainable power system be developed for the hospital because the price of diesel fuel was expensive.

While working on a project that explored ways of making traditional biodiesel processes more efficient, Mowry heard about the Mcgyan process.

Unlike other traditional biodiesel processes, the Mcgyan process does not require any additional chemicals or water and does not produce waste, Gorman said.

It is also cheaper because it can use any type of fat and alcohol, Hofmeister said.

When Mowry heard about the new process, he contacted the Mcgyan inventors and the board of directors for SarTec Corporation, which owns the intellectual property for the process.

Mowry said he discussed the uses for the Mcgyan process in developing countries, such as Tanzania, with the board of directors. Afterward, he obtained an exclusive license to develop the process for humanitarian application.

“I was able to develop a senior design project at St. Thomas that ultimately led to the Generation One biodiesel system,” Mowry said. “Generation One succeeded gloriously.”

Mowry and six engineering students began to work on Generation One, the first portable biodiesel system, in September 2008.

“This [biodiesel] process is very clean, very fast and scalable,” Gorman said. “We used the same [Mcgyan] process and scaled it down to fit in the back of a pick-up truck. This was the most complex project the engineering department has handled in a short amount of time. It combined aspects of chemistry, engineering and electrical.”

Since May 2009, Mowry has been working on Generation Two, a more economical, efficient and robust version of Generation One.

“The Generation Two design doesn’t only satisfy the needs for a developing country application, but that same design can address farm applications, university applications and home applications,” Mowry said.

Due to financing difficulties, however, Generation Two has yet to be built.

Financing difficulties

“My back is really sore from people patting me on the back and telling me I’m doing a great job and a service for humanity,” Mowry said. “But when the day is over, no one wants to invest anything in it.”

The portable biodiesel system has been featured on television twice and shown throughout Minnesota and Iowa in several U.S. Department of Agriculture events.

“[Generation Two] is well received but hasn’t been financed yet,” Mowry said.

It cost about \$50,000 to build Generation One. The project received funding and support from a variety of organizations, including the U.S. Department of Energy, Mowry said.

Mowry estimates Generation Two will cost \$50,000 to \$70,000 and he has already put about \$8,000 of his own money into the project.

“Anything less than \$50,000 just doesn’t get you seriously started,” he said. “At some point when you don’t receive the funds, you have to move on. But I’m not even thinking about giving up yet.”

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