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UW team gears up for a fuel-cell future

Matt Stevens will one day drive on Canada's highways in a car that will emit virtually nothing except water and heat. It will be a hydrogen fuel-cell car.

There are prototypes of such cars now, but the technology is expensive and the cars have limited power. They also can't travel far before needing to be refuelled. So the technology is not ready for the masses.

But Stevens, a 24-year-old chemical engineering master's student at the University of Waterloo, believes his generation will one day be driving hydrogen fuel-cell cars.

"I have no doubt about it," Stevens said yesterday. "I will be driving a fuel-cell car and I think it will happen sooner than later."

Stevens has reason to be confident. He's part of a UW team that will help to make it happen. UW is the only Canadian school to be chosen for a North American clean-air car competition, the contest sponsors announced in Toronto yesterday.

Engineering students from 17 post-secondary schools are in the competition.

Over the next three years, students in the Challenge X competition sponsored by General Motors and the U.S. Department of Energy will develop clean-energy cars that are practical and economical.

Some teams will work with ethanol. Some will try bio-diesel. Some will work on electric cars that are hybrids using a battery with some alternative fuel.

But the Waterloo team will work on a hydrogen fuel-cell vehicle. And they want it to have the same range and power of today's cars.

General Motors of Canada, Hydrogenics Corp. and Natural Resources Canada are all supporting the team's efforts.

During the first year of the competition, the core UW team, with about 60 to 100 students, will create models and write reports about what they plan to do.

At the end of the first year, the students will receive a new 2005 Chevrolet Equinox subcompact utility vehicle. Then they'll strip out its engine and guts. They will rebuild the car's internal organs -- such as the power train and drive shaft -- making it into a vehicle that will be fuelled primarily by a hydrogen fuel-cell stack.

Hydrogenics Corp., based in Mississauga, will work with the students in providing the fuel-cell technology.

About $1.1 million worth of materials and expertise are being put into the project over three years by the sponsors. General Motors will even let the students in on its vehicle-development process so they can learn about car- building in the real world.

"The students will actually get to see what happens in industry and that is something they don't often get a chance to do," said UW mechanical engineering professor Roydon Fraser, who is supervising the students.

The two main challenges will be getting power and range out of the hydrogen fuel-cell vehicle, Fraser said.

"If we hit the 200-mile (320-kilometre) range with it, we will definitely be setting a record. But that is going to be very hard," he said.

Vehicles will be judged on how well they run and whether they have the power to be commercially viable. But judges will also score the vehicles on how much air pollution is generated in producing the alternative fuel in the first place.

That's the challenge with hydrogen. Unfortunately, natural gas -- a fossil fuel -- is currently the most cost-efficient way of making the hydrogen. So the UW team will need a cleaner way of refuelling their hydrogen vehicle. One possibility is to make the hydrogen from ethanol, which comes from renewable crops such as corn.

There will be $50,000 in prizes given to winners in each of the three years of the competition.

The UW students vowed to put Canada on the map with the hydrogen fuel-cell technology.

"Waterloo is not in this competition to do well. We are in this competition to win," Stevens said as his teammates cheered.