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Next 'hydrogen highway' outpost: Humboldt State

University becomes northernmost fueling site, but distance between stations limits use to local cars only

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Humboldt State University will be the northernmost outpost of California's "hydrogen highway" when it gets its hydrogen fueling station operating within the next several days.

The university's fueling station, however, will be only of use for locally owned cars.

Arcata is too far away from the next-closest hydrogen station, which is in the Bay Area, for a hydrogen-fueled car to make the trip without running out of fuel somewhere in the redwoods.

"That's why we are calling it an outpost," said Peter Lehman, director of the university's Schatz Energy Research Center, which is building the hydrogen station.

The lone customer at first will be a Toyota Prius hybrid that was converted at a cost of \$45,000 to run its engine on hydrogen. The conversion and vehicle lease are being paid for by the state Air Resources Board.

It also will be the personal car of university President Rollin Richmond, a proponent of new technology. The vehicle also will be shared with officials at Eureka's Caltrans office, which contributed funds to the refueling station.

"We do have a serious energy problem in this country, and I think the increase in gas prices had drawn attention to the need for alternative energy," Richmond said. "Hydrogen and fuel cells are a good candidate for that. This is a way to bring to it to the attention of our students and the community. It is a source of energy that is clean." The Schatz Energy Research Center has been involved in research focusing on fuel cells and has also been involved in a proposal by Shell Oil Co. to put dozens of wind-powered generators on a nearby ridge.

The Toyota arrived at the university on the back of a truck Wednesday.

"It is the beginning of a fleet of vehicles, and I hope it is the beginning of a whole new infrastructure," Lehman said.

The hydrogen highway is a program started by Gov. Arnold Schwarzenegger in 2006 to create an infrastructure for cars that run on hydrogen fuel or have fuel cells that use hydrogen.

"The idea was to create an infrastructure for refueling and for the public to embrace hydrogen fuel cells," said Dmitri Stanich, a spokesman for the California Air Resources Board. "We are trying to lay the groundwork to invite the major energy manufacturers to see this as a viable option."

The state is investing \$17 million in promoting oil companies to create hydrogen fueling stations. Currently there are 25 stations, the majority in Los Angeles, the Bay Area and Sacramento.

The 26th station is opening Thursday at a gas station in Los Angeles, and the Humboldt station will be 27th. At least seven more are on the drawing board.

"The question about fuel cell technology and hydrogen technology was which would come first: Would the vehicles come first or the hydrogen stations?" said Roy Kim, a spokesman for the Fuel Cell Partnership, which has a Sacramento facility where seven major automakers are testing fuel cell vehicles.

Currently, there are not enough hydrogen stations between the major cities for fuelcell cars, which have a range of about 300 miles.

Humboldt State's hydrogen-fueled Prius has a range of 100 miles, so even if a station is built in Redding, 135 miles away, it is not close enough.

Kim said urban areas are the focus because it is there that fuel-cell cars can make the most impact by replacing gasoline and diesel cars, buses and trucks.

There are now about 200 fuel-cell cars and buses in California.

A fuel cell is a sandwich of materials in an enclosed case that produces direct current electricity in a chemical reaction between hydrogen and oxygen.

"It's a super-low-emission vehicle. There is no carbon in the exhaust at all," Lehman said.

The only byproduct from the fuel cell, which is small enough to fit under the rear seat of a car, is heat and water.

The drawback is the high cost of a fuel cell and the electric power needed to remove hydrogen from water for the fuel.

Lehman said the Humboldt plant now uses electricity from the grid to electrolyze water to remove hydrogen, but in the future it will use solar or wind power.

Hydrogen fuel itself is safer than gasoline because it rises and diffuses into the air quickly if there is a leak, Lehman said.

"Hydrogen is a link, an important link, between renewable energy and transportation fuel," Lehman said.

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