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The first element

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When junk rots, it gives off gas. When acres of stuff decomposes, it gives off lots of gas.

Humboldt State University's Schatz Energy Research Center wants to take that gas -- half of it is methane, a potent greenhouse gas -- and make it into electricity, heat and hydrogen fuel. What started as an Evolution Energy Systems student project earned accolades from the National Hydrogen Association, and has won face time with Chevron executives. Chevron's paying for a feasibility study.

The Cummings Road Landfill outside Eureka is the source of the gas. It's closed, and when it's capped, it will produce even more landfill gas, which has to be burned if not used.

The waste is really a renewable resource, said center Director Peter Lehman. That resource could support a hydrogen power park, a progressive idea that proponents say would put Humboldt County on the nouveau energy map.

"You would have people from around the world coming here to see how it works," Lehman said.

The methane from the landfill would be captured and cleaned of contaminants like sulfur compounds and halides, then piped to a Eureka facility. There it would be used to power a molten carbonate fuel cell, which could run a generator.

Excess hydrogen would be captured, purified, compressed and sold as a fuel for vehicles. Lehman estimates that on 100 standard cubic feet of landfill gas per minute, 200 kilowatts of electricity, 100 kilograms per day of compressed hydrogen and 75 therms of heat per day could be produced.

Based on a recent study, there appears to be enough gas to run such an operation for at least 20 years.

If it's built, it will be expensive, perhaps \$6 million to \$10 million. But Lehman said the goal

isn't to produce cheap power, but to pave the way for better hydrogen technology. There are fewer than 50 hydrogen fueling stations in the United States.

Patrick Serfass with the National Hydrogen Association said Humboldt County could prove that it's not only large cities that can use such technologies. A power park like the one the center is proposing would allow a transition to hydrogen fuel availability by starting small.

"You have to ramp these things up," Serfass said. "You can't just have it all in one day."

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