

Traveling Exhibit Promotes Independent Inventions

Inventors are tackling problems in energy, medicine, and construction -- and fueling interest in science and engineering.

By Kevin Bullis



Hugh McLaughlin, a semi-finalist in the independent inventors contest, standing next to an exhibit of his work: a technology for harvesting energy from waste products. (Photo by Kevin Bullis.)

The [National Inventors Hall of Fame Foundation](#) and [The History Channel](#) are co-sponsoring a contest this month to award a \$25,000 grant to an independent inventor. In a traveling exhibit, they're also showcasing the 25 semi-finalists.

[For images of 14 independent inventions and the traveling show, [click here.](#)]

One of the inventors, Hugh McLaughlin, has developed a recycling technique that uses waste products as fuel, which could make ethanol production more efficient, he says. "A corn-to-ethanol plant currently produces a million gallons a day of this [waste by-product], and there's really no profitable outlet for it," he says. "This is going to allow them to harvest that million gallons a day and recycle it effectively."

His process uses activated carbon -- the same material found in gas masks and home water purifiers -- to promote the oxidation of materials that, at normal burning temperatures, undergo reactions that prevent them from combusting well, McLaughlin says.

Chemists have long known that activated carbon adsorbs organic molecules. It also has a very high surface area -- around one million square meters in a two-liter container of activated carbon. McLaughlin found that oxygen will react with organic molecules on this surface at certain temperatures, creating what he refers to as "a flame one molecule high," but spread out over a square kilometer.

To optimize the burning process, McLaughlin made a rotating cylinder to turn over chunks of the activated carbon in the presence of organic material, while air is pumped in through the center. One possible organic fuel, mayonnaise-textured "stillage," a by-product produced during the conversion of corn to ethanol, heats up in the container and infiltrates the pores of the carbon to make the oxidation possible. So far, he has

produced a device using a canister not much bigger than a kitchen wastebasket, but he's developing one that will hold 900 kilograms of activated carbon. An industrial scale system could be the size of a propane tank on a tractor-trailer that will use 20 million kilograms of carbon a year, he says.





"Most of the applications in industry are going to take this waste stream, harvest the energy out of it, and use that heat right back in the production facility to cut down on the outside resources they have to consume," McLaughlin says. The process could heat the facility, or create steam to generate electricity. "What's then produced is a fertilizer that they could recycle back into the fields," he says.

Like many of the other semi-finalists, McLaughlin hopes the contest will help him bridge the gap between early prototypes and wide-scale industry adoption of the technology. Right now, he says, the attitude in industry is "Show me that it works, and if it does, I'll buy the next one. There really isn't a good mechanism to cultivate some of these industrial ideas."

McLaughlin's invention -- along with the other 24 finalists' prototypes, including a remote-controlled system for [reining in a horse](#), a [robotic system](#) for fast house construction, and a "[wearable motherboard](#)" for monitoring the health of soldiers -- are on display now at the Museum of Science in Boston.

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