

Inventors say Hydra offers clean water, hope for villages

July 5 2010, By Sandy Bauers

The hose took brownish water from the scummy Schuylkill River in Philadelphia to a strange apparatus on the bank -- a trailer with a solar panel, a hydrogen tank, and other odd parts with flashing digital readouts.

From another hose came clear water. David Squires picked it up and drank.

"Hey, save some for me," Mike Strizki called out.

Any other takers? No. But dozens of onlookers Tuesday were curious enough to learn more about the machine.

Unveiled weeks ago, the Hydra uses solar power to make clean water from contaminated, removing viruses and bacteria, its inventors say. But it will not remove [heavy metals](#), pesticides or medicines.

In one day, it can produce 20,000 gallons, or four gallons apiece for 5,000 people.

It also uses the excess power -- 70 to 80 percent is excess on a sunny day -- to charge onboard batteries and separate [hydrogen](#) from water.

At night, the hydrogen is run through a fuel cell and turned back into electricity. Or it can be used as cooking fuel on a special stove.

By the way, the machine also turns out medical-grade oxygen, the other by-product of separating the water into its elemental components.

"No waste," Strizki boasted.

Squires, Strizki, and a third partner, Brad Carlson -- who formed a Hopewell, N.J., company called The Essential Element to develop their idea -- envision the Hydra being used in disaster areas and villages in developing nations.

But big hurdles remain.

Squires and Carlson are the owners of Oil Free Now, which installs geothermal heating and cooling systems.

Strizki, an alternative-energy inventor, powers his New Jersey home completely with solar and hydrogen.

The team financed the project, although Carlson would not say how much the trio invested. They are seeking backers to manufacture the machines, expected to cost \$99,000.

They also lack independent verification that their machine works as promised. But Carlson said the components aren't unique. The [water purification](#) membranes, for instance, are certified by the National Sanitation Foundation, he said.

Projects like theirs are getting increased attention, not only because developed nations are taking greater interest in providing for developing ones, but also because scientists say climate change could exacerbate water supply and water-quality problems worldwide.

Entrepreneur Dean Kamen, who invented the Segway personal

transporter, also devised a machine he calls the "Slingshot," which purifies water but needs fuel to run.

A group at the University of Pennsylvania is working on ways to harvest off-peak power from cell phone towers -- common even in [developing nations](#) -- and use it to provide water purification and refrigeration for medicines.

A report this year by the United Nations and the World Health Organization found that 900 million people lack good access to [clean water](#), causing widespread disease.

"For us, diarrhea is bad take-out," said John Sauer, spokesman for the nonprofit Water Advocates. But it kills 1.5 million children under age 5 every year.

The Hydra may be an intriguing newcomer, he said, but what about when the purified water leaves the machine?

A villager -- usually a woman -- will put it in a container of dubious cleanliness and carry it home. Then maybe she'll pour it into a glass, also possibly dirty, and pass it to a child with unwashed hands.

At that point, "you've got contaminated water again," Sauer said. "So much of this is not an engineering issue. It's an educational issue."

He also wonders about sustainability. The Hydra developers say it can fit into a standard shipping container and, at 3,000 pounds, arrive by helicopter or even be parachuted from a supply plane.

"But can the community afford it? Can they repair it if it breaks down?" Sauer said.

Carlson said the Hydra's components are plug-and-play, easily replaceable. The machine also has onboard telemetry that, if triggered by one of several sensors, sends an immediate e-mail via satellite to as many as 10 people, alerting them to the problem.

Pennsylvania State University professor Bruce Logan, director of the Hydrogen Energy Center and the Engineering Energy and Environmental Institute, termed the Hydra a "nice piece of engineering" but not a game-changer, based on looking at the company website.

"We can do all these things separately," he said. "They've just done them together."

But to Peter Wermsdorfer, who works for a Scranton company that provides energy-management services to towns and saw the Hydra on Tuesday, that's the beauty of it.

"Those guys have integrated everything that everybody in the [water](#) business has talked about for the last 20 years," he said, "and they've put it all on one unit."

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