Fuel Cell future is here

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Jadoo fuel cell assembly

By 2010 Americans will require 10 kilowatts-hours of "personal power," compared to the 10 watt-hours averaged in 1980 (Motorola estimates). But while the power of computer chips has doubled every couple years, battery power has advanced little in that time. Now a small US company leading the way in Fuel Cell production may be providing some answers. With only 32 employees, Jadoo Power is responsible for 11% of all shipments of Fuel Cells, according to the company. That it has real live Fuel Cells on sale now is impressive in an industry which is more mouth than trousers. We bring you an exclusive interview further down.

Fuel cells generate electricity through a chemical reaction involving hydrogen - a component of water, and abundant and nonpolluting. Much of the recent publicity over fuel cells has been lavished on big ideas like hydrogen-powered vehicles or electrical generating plants. Jadoo (the name means "miracle" in Hindi) has different aspirations.

It wants to be the power source for such devices as TV cameras, satellite telephones, surveillance cameras and other products that need to be portable but have hefty power requirements.

The market for smaller fuel cell devices is getting lots of attention from technology companies but hasn't resulted in many products yet, said Dan Benjamin, an analyst with ABI Research in Oyster Bay, N.Y.

Jadoo says its fuel cells are environmentally friendly, have less weight than normal batteries, no memory loss and a longer run time.

We spoke to Jack Peterson- VP Sales for Jadoo Power. The first thing we raised was Jadoo's competitors: "There are probably 2700 companies working on (the fuel cell area) but only 7-10 with product and only 4-5 in any volume," he told us, " and none of them

really have the power output we have — 100 Watts for under $1000 dollars – but there's a lot of promises.

Jadoo, based in Folsom, CA, will stretch in the power range from 20W to 3KW. Its Fuel cell sits in a 4x6x4 inch cube, to protect the active hydrogen element. The other ingredients are a Hydrogen refill canister – a patented shape two inches in diameter and five inches tall; a patented refill station. The final requirement is access to standard sized tanks of hydrogen to be found in places like your local welding shops, and in the future in garages nationally.

"We are positioning the fuel cells to a variety of markets – the biggest markets we are planning to attack is what we call First Responder – everything from law enforcement to medical," said Peterson. "The broadcast market was our initial launch" (news and documentary cameras have to stay running as long as possible in the field). "Next is portable office – off-grid critical data collection – notebook usage, satellite uplink – anything in the office – and the final market is hobbyists and innovators

"We look at the world of power an devices differently – its not what you use; its how you use your device. For example a first responder who has a 2-band radio walkie–talkie – the power source on the device, the battery, is perfectly fine, - the breakdown happens when that battery is drained and you need to put it into a charger and there is no plug to put the charger into.

In the broadcast world we have strong reasons to replace your primary battery with a fuel cell: there's infinite run time — if you pick up a battery after a day or a week its drained - but a fuel cell is just like your gas tank. If you leave your car for a day or a week or a month it's the same tank of gas when you start it.

"We look at how those markets are using the applications- we home in on power modules by size of battery. We put out 12 volts nominal DC – and sell the accessories that allow you to connect a cigarette lighter to our fuel cells and step you up and zap out about 85 watts.

Off-Grid.net is lining itself up to become the first UK and European distributor. But there's a mountain to climb first: "Our international strategy is primarily US and Canada - but the issues are to do with the transportation of hydrogen – there's a snake's den of rules and regulations. In the US we are the only company with an air cargo exemption to ship the canisters by air cargo – from the DoT - so in every market we have to work with the local regulations.
If you are filling hydrogen canisters there may be local or countrywide fire codes that have to be met to use the product.

"In some places the raw hydrogen is not necessarily delivered to residences. So we look at what provisions need to be made. The canisters do contain a material called a metal hydride — it's a pyrophoric material – which we hold in a patented canister. But it could be against the rules.

One Sacramento company, Altergy Systems, is working on smaller fuel cell devices, but has nothing for sale yet.

MTI MicroFuel Cells, a firm in New York state, is the only company other than Jadoo to have small fuel cells on the market, said Glenn Eisman, a fuel cell consultant and director of the Center for Fuel Cell and Hydrogen Research at Rensselaer Polytechnic Institute in Troy, N.Y.

MTI is working on methanol-based fuel cells, rather than hydrogen. Methanol is considered more promising for small devices like laptop computers.

Eisman, who has consulted for Jadoo, said smaller devices like Jadoo's are promising because many of the technical challenges are already solved. For instance, hydrogen is readily available from industrial gas suppliers, so organizations like TV stations can always have several bottles on hand. One bottle has enough hydrogen to power a camera for a year.

Andrew Burke, a researcher and fuel cell expert at the Institute of Transportation Studies at the University of California, Davis, points out that hydrogen is more expensive than electricity for recharging a device - about 15 cents per fill-up, compared with 2 cents for recharging a battery.