

Xtreme Power: Super Dry Battery

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The Texas-based company has revived a battery technology it says can last 20 years, discharge like a capacitor, and keep working after being shot up with a machine gun.

It's a dry-cell battery made of solid materials, able to discharge and recharge at almost perfect efficiency over the course of decades, stay working after being shot full of holes, and come to market at a price other battery makers can only dream of.

Xtreme Power says its PowerCell battery is ready to disrupt the industry with this set of capabilities – and after working quietly on the technology for some time, it's primed to bring it to mass-production scale.

The Kyle, Texas-based startup is already making its batteries in three smaller-scale manufacturing facilities, Carlos Coe, CEO and founder, said in an interview last month. It's also testing them with Hawaii Electric Power, in a project meant to stabilize the intermittent power coming from wind turbines, and has had one 500-kilowatt battery powering a remote observatory in Antarctica since 2006, he said.

Now it's seeking to raise up to \$475 million to contribute to a factory at a closed Ford Motor Co. plant in Wixom, Mich. capable of turning out about 2,000 megawatts of batteries per year, Coe said see [Green Light](#) post).

That plant, meant to be built in partnership with Santa Barbara, Calif.-based solar panel maker Clairvoyant Energy, could also see the two companies integrate their solar power and battery systems, Coe said.

"We would represent the power electronics portion of the equipment they'll be producing in the future," he said. "The new approach would be integrating our approach with large-scale solar."

While he said it was too early to say if this meant solar-plus-battery systems rolling off the factory floor, "it's a fair thing to say we're working toward that direction," not just with Clairvoyant but also with other solar panel manufacturers he declined to name.

As for in-the-field proof of concept, Xtreme is testing its PowerCell batteries in applications from pickup truck-sized replacements for diesel generators to megawatt-sized units in the Hawaii wind power project, Tom Cain, partner with Xtreme investor Sail Ventures, said at the GreenBeat conference in San Mateo, Calif. last week.

Cain described PowerCell as a fiberglass battery designed back in the 1990s in an effort by Corning, British Aerospace and Ford Aerospace. The battery was spun out into a company

planning to develop it for California's erstwhile zero-emission vehicle market – a plan that collapsed, along with General Motors plans for its EV1 electric car, when the state backed off its ZEV timeline, Cain said.

Xtreme Power, founded in 2004, bought the technology, and has since raised about \$20 million from investors including Sail Ventures and the Texas Emerging Technology Fund, the **Austin Business Journal** reported in June. That explains why the PowerCell technology hasn't gotten much attention before now, Cain said - but he's not afraid to attract attention now.

"This battery is unlike anything the world has ever seen," he said. That includes cost – about one-tenth the cost of comparable sized lithium-ion systems, he said.

If the technology can live up to its promises, "Xtreme Power has the potential to introduce a disruptive technology to the current energy storage landscape," Sam Jaffe, senior research analyst at IDC company Energy Insights, said in a Friday email.

Beyond the combination of high-power output, high-energy density, long cycle-life and high efficiency, "We've heard that they can sell their battery systems for \$500/kWh [kilowatt-hour] and still make a profit," Jaffe wrote.

That price would be well under the kilowatt hour prices that are typically quoted for other battery systems, which are meant for large-scale energy storage applications. And it could approach the price points for mass energy storage systems like pumped hydro and compressed air energy storage (see **Top Ten Smart Grid: Energy Storage** and **Grid Energy Storage: Big Market, Tough to Tackle**).

Xtreme Power itself hasn't given price figures for its PowerCell. It also says that its battery shouldn't be called a lead-acid battery.

Still, most observers, including Jaffe and Dan Rastler, energy storage program manager for the Electric Power Research Institute, place Xtreme Power in a class of so-called "advanced lead acid" battery systems seeking to make key improvements to age-old lead-acid chemistries (see **Green Light** post).

"This is one of several lead-acid battery technologies we've been following," Rastler said Friday. Lead-acid batteries can offer the advantages of working with cheap, safe and easy to recycle materials, he noted.

Beyond Xtreme Power, EPRI is interested in learning more about technology from Australia's **Ecoult** and the **Australian Commonwealth Scientific and Research Organization (CSIRO)**, advanced lead-acid batteries from Japan's **Hitachi** and **GS Yuasa Group**, and systems being developed by large-scale battery manufacturers East Penn and Exide, which are teaming up with startups providing new technologies, Rastler said.