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Xtreme Power to Sell Battery Factory, Focus on Software

10-year warranties for grid batteries are hard for startups—but software makes sense.

JEFF ST. JOHN: APRIL 5, 2013

Xtreme Power, the Lyle, Texas-based startup with a decades-old advanced lead-acid battery technology and about 77 megawatts of grid-scale storage deployed around the world, is getting out of the battery-making business to focus on a less capital-intensive field -- building and managing the software platforms that integrate these expensive batteries into the grid.

Xtreme CEO Alan Gotcher told me this week that Xtreme plans to sell the Oklahoma-based factory where it makes its solid-state, advanced lead-acid PowerCell batteries, and has a signed letter of intent from a buyer with experience in the battery business.

After a temporary shutdown, that buyer intends to restart the plant to help Xtreme fill its ongoing orders for its PowerCell batteries, he said. At that point, the new owner will become another customer to the startup's new line of business, its Xtreme Active Control Technology (XACT) software platform.

Over the past year, Xtreme has signed up two other deep-pocketed battery makers to use its grid-integration software and services expertise -- General Electric for its sodium-metal Durathon batteries, and Samsung SDI for its grid-scale lithium-ion batteries. Xtreme is

also working with a fourth, unnamed maker of lithium-titanate batteries, and expects to announce that relationship in the coming months, Gotcher said.

Xtreme has installed about 77 megawatts of its PowerCell and BMS arrays at fourteen sites around the globe, including the largest battery-based grid storage project in the United States, a 36-megawatt, 24-megawatt-hour system for Duke Energy's Notrees wind farm in Texas. The company has about 30 megawatts of new business so far this year, which includes a mix of its own battery chemistry and those of its new partners GE and Samsung, Gotcher said.

In other words, Xtreme isn't abandoning its own battery chemistry, he said. It's simply letting go of the most capital-intensive part of its business, which is building, selling and financially backing the batteries themselves, he said.

"It takes a lot of capital to run a battery factory," Gotcher said. "In selling it to a third party, they'll make the investment in the factory, and it reduces the capital appetite for Xtreme Power." While he wouldn't say how much money Xtreme was being paid for the factory, he insisted that the sale was in no way meant to plug financial holes in the startup.

"Frankly, it really helps us a lot," he added. "It reduces our need for capital, and from our point of view, it means our cash flow will turn positive, probably a year or so earlier," he said. Xtreme, which has raised about $55.7 million since it was founded in 2004, now expects to reach profitability in late 2013 or early 2014, he added.

The Challenges of the Big Battery Business

Xtreme has certainly made its mark in the battery business. Its installed base puts it in the big leagues of a still-tiny market for grid-scale energy storage players, such as AES Energy Storage, which has installed more than 100 megawatts around the globe, or BYD, which last year built the world's largest installation, a 36 megawatt-hour grid-scale lithium-ion battery array in China.

At the same time, Xtreme faces huge competitors, including General Electric, Johnson Controls, Saft, LG, Panasonic, NGK, Samsung and the bankrupt (and now Chinese-owned) A123, all trying to bring

brand-new, relatively untested energy storage technologies to a field that's never used them before.

While Xtreme does have lots of installations, most of them have been done as pilot projects, or with third-party financial backing, such as the Department of Energy's smart grid stimulus grant program. That has buffered the company from bearing the full financial burden of guaranteeing its batteries that one might expect would come with a non-subsidized, commercial-scale project.

As for Xtreme's PowerCell battery chemistry, which is based on technology developed by Tracor and Ford Aerospace in the 1990s, it promises to match lithium-ion's energy density and other technical strengths, while overcoming some of its key challenges. Those include lithium-ion chemistries' thermal management challenges (that is, keeping them from catching on fire). Xtreme says its solid material-based batteries can be shot full of holes without catching fire.

At the same time, a fire that destroyed Xtreme's 10-megawatt battery on Hawaii's Oahu Island last year has put those claims under scrutiny. Gotcher told me this week that investigators have ruled out 30 of the 32 possibilities they started out with, leaving only two hypotheses, including the possibility that "foreign material" was somehow set on fire within the building. In fact, a security video recording of the event shows that the fire actually started on the concrete floor of one of the aisles running in between the battery arrays, indicating that it did not start in the batteries themselves, or in the inverters that connect the batteries to the grid, as was the case in a previous, smaller fire at the facility, he said.

Turning to BMS as the High-Value Solution

All of these factors played a part in Xtreme's decision to sell its plant, Gotcher said. In particular, it's difficult for a startup to tackle the capital costs of offering warranties on batteries themselves, since they're both the most expensive part of the energy storage system, and the most untested.

Xtreme's BMS, on the other hand, is backed up by the company's relationships with companies like GE, Samsung and -- if all goes according to plan -- the future manufacturer of Xtreme's Oklahoma advanced lead-acid battery chemistry, he said.

"We've asked companies like Samsung if they would backstop -- that is, stand behind the Xtreme Power warranty -- and the answer is yes," he said. In other words, while Xtreme takes on the warranty for its control system and integration work, its battery-making partners take on the heavy-duty warranties for their megawatts of energy storage chemistries.

Xtreme's strategy appears to make sense, given the dynamics of the grid storage business, according to David Groarke, smart grid senior analyst for GTM Research. "A clear competitive advantage for smaller firms in this industry will be to be hardware-agnostic, and to be able to supply seamless turnkey solutions to utilities and customers while battery technology continually innovates on the backend without disruption to service," he said.

Software also doesn't require the same R&D dollars that batteries will continue to need as new chemistries and component advances challenge previous generations of technology, he noted. But beyond that, there's the cold, hard fact that the best batteries in the world are little more than dumb on-off devices with little use for utilities, unless someone builds the hardware-software interconnections necessary to integrate them into the grid.

Xtreme isn't the only player building BMS functionality into grid storage, of course. A123 does grid-scale battery software for its deployments. Startups like Greensmith are building BMS technologies using a variety of batteries for utility purposes, and so are grid giants such as ABB and S&C Electric, to name a few contenders.

Getting all these batteries, inverters, grid and building-side power interconnections and other devices to work together is a complicated task in itself. For example, Xtreme installs high-speed communications modules inside inverters from vendors like Eaton, Dynapower and Parker-Hannifin, Gotcher said, both to control the draw and output from the batteries and to provide reactive power and " full four-quadrant" grid-smoothing capabilities from the inverters themselves, Gotcher noted.

At the same time, getting the power controls right is only half the challenge. The other half is in getting that resource to pay its way on a grid with a bewildering and still-unformed set of regulations and economic use cases for battery-backed grid storage. So far, grid batteries have been limited to specific use cases where they're less

expensive than the alternative, such as backing up a power corridor that would otherwise need new power lines or other infrastructure investment.

But wind and solar power could create a whole new demand for energy storage, because of their intermittent nature. While batteries are too expensive today for bulk energy storage, like storing gigawatts' worth of wind power generated at night for use during peak daytime hours, they can smooth and balance the output from wind farms and solar panels on a shorter-term basis, whether in warehouse-sized, multi-megawatt arrays or in kilowatt-scale neighborhood or "community energy storage" setups.

"As increased sophistication of the value chain in storage is becoming more clear, we will see quicker commercialization possibilities as costs are rationalized" on these fronts, Groarke noted. Studies on the various technical and economic use cases for grid-scale batteries abound, and we're also seeing some early moves by regulators to start demanding it on the grid. But batteries are still expensive, and their use on the grid is still in its infancy. It will be interesting to see how Xtreme and other BMS vendors strive to drive down those costs with software and integration expertise, even as they bow out of the game of making the big batteries themselves.

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