



Powin battery energy storage systems

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Grid-scale energy storage has quickly grown from a fledgling industry to an essential part of an increasingly renewables-powered grid. Through the first three quarters of 2023, 13.5 GWh of storage was installed, more than the 12 GWh installed in all of 2022.

One of the major U.S. companies operating in this space and riding this growth trajectory is Powin, provider of lithium-ferro-phosphate grid-scale battery services. The company's sales have exploded from \$200 million in 2021 to \$2.2 billion in 2022.

Powin has deployed over 3,200 MWh of battery systems worldwide, with another 11,900 MWh under construction as of Q4 2023. It typically installs batteries of two- to four hours of duration that provide grid arbitrage services, peak demand shaving, and storage-as-transmission services.

The company has had a busy past two years, including acquiring power electronics company EKS and then selling majority stake to Hitachi Energy, securing a massive project with Akaysha Energy, which is owned by major investment group Blackrock.

In 2023, Carroll said the company moved its focus toward building and delivering on the booked orders it received in 2022. It is ramping up manufacturing and has active sites in China and Mexico and is ramping up operations at a Vietnam plant. The company also set up contract manufacturing operations in the United States in Utah.

"Once of the exciting things that has happened in 2023 is the confirmation on the data analytics and how we are using software to predict battery performance better," said Carroll. "We doubled down on the investment in the lab, we doubled down on tracking performance at the cell level."

Carroll said there are three aspects that make their battery service different. First, the company made the investment in advanced sensors to track battery cell temperature, voltage, performance. This helps ensure optimal operations and helps Powin set a performance guarantee for its products. Second, the extra visibility into the cell level offers millions of datapoints that are used to drive Powin's battery operation software and allows the company to develop predictive analytics for grid operations.

"The EKS acquisition will give us direct access to an industry-leading team, their power conversion technology, advanced controls, and decade's worth of experience; enabling Powin to offer a fully wrapped solution to further enhance the customer experience," said Powin strategic advisor and board member Geoff Brown.

When asked about the Inflation Reduction Act's impact on Powin's business, Carroll noted the legislation has

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driven demand for U.S.-based products and support teams. Today, he is seeing customers willing to ink deals with Powin that are two or three percentage points more expensive than foreign competitors. Powin has a dedicated staff of over 80 U.S.-based people in its project success team and other 60 U.S. employees in its services department, and customers have been willing to pay to have local expertise.

As it relates to supply, grid scale batteries have had to compete with the EV industry for lithium carbonate, the essential material in conventional storage. Grid-scale storage only represents about 3% to 5% of overall demand, placing it at the mercy of EV battery demand when it comes to supply.

However, Carroll said conditions have improved. Shipping and logistics costs have come down from their extreme Covid-era highs. The global supply of lithium carbonate is ramping up considerably, and recent unexpected dips in EV demand have offered buying opportunities. Now, grid-scale storage is increasingly being viewed as an essential service, and Carroll said it has grown enough to carve out its own steady supply.

Lithium-ion batteries continue to be the most bankable solution for grid-scale storage, but Carroll recognized that alternatives could still emerge over time. Sodium, vanadium, and other long-duration energy storage chemistries may emerge. Carroll said Powin is flexible and able to change with emergent technologies. By leveraging its partnerships, focusing on software and analytics, and investing in teams of U.S.-based experts, the company is poised to adapt to an ever-evolving industry.

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Web: <https://sumthingtasty.co.za/contact-us/>

Email: energystorage2000@gmail.com

WhatsApp: 8613816583346

