

Lithium-Ion Faces Competition For Investment In Solar Energy Storage

BY MARA LEMOS STEIN

GOVERNMENT

11/4/2009 – Solar energy developers are starting to invest in energy storage to integrate with photovoltaic power systems, with lithium-ion technology emerging as a strong but not the sole contender for the application.

Lithium-ion battery systems offer long duration, are relatively lightweight and small, and with the growing investment in manufacturing for use in the electric vehicle, they offer the potential to complement applications in transportation, researchers and technology developers said. But the verdict isn't out yet if lithium-ion is the most cost-efficient way of storing power from solar systems.

"We've been trying to understand the stationary markets for lithium-ion that could be used for utility applications and that could complement the wave [of research and development] that's going on for transportation," said Dan Rastler, who heads the energy storage program at the Electric Power Research Institute Inc., or EPRI, in an interview with Clean Technology Insight.

EPRI, an industry group whose membership includes 90% of the electricity generators and distributors in the U.S., is studying a host of technologies for the utilities that include integrating renewable energy, Rastler said. When it comes to lithium-ion, it hopes to find applications with a large market size and the highest value to drive production of batteries and reduce costs, he said.

Lithium-ion technology, which revolutionized consumer electronics products over the past decade, holds the most promise for the electrification of transportation, technology developers and researchers say. But lithium-ion battery systems have had very limited applications so far in utility scale storage or in the integration of renewable energy into the grid, said Rastler.

Raymond Wiley, director for North American sales of solar module maker Aide Solar U.S.A. said the level of integration could change soon. Aide Solar's parent company, The Panjit Group, last week announced the acquisition of the lithium-ion technology developer and manufacturer LiFeTech, formerly LiFeBatt Production Inc., with the intention of not only expanding into the electric vehicles market but also to provide energy storage options for its solar power clients.

"You're going to need some energy storage with solar, you need to collect the energy and store it for use later," Wiley said in an interview. Taiwan's Panjit Group has businesses in semiconductors, LED lighting, photovoltaic technology and now lithium-ion batteries, so it is in a strong position to offer clients the storage for projects, he said.

"The biggest hurdle to overcome [for lithium-ion batteries] is the cost, not the technology," said Wiley.

The Panjit Group acquired LiFeTech's lithium-iron-phosphate battery technology and its manufacturing facility in Taiwan. Wiley declined to disclose the value of the investment. He said LiFeTech is working in vehicle programs with Ashwoods, in the U.K., which is developing hybrid-electric vans; with Italy's Adiva, which makes electric motorcycles; with Germany's Bosch, which is developing electric vehicle technologies; and Aston Martin, which is using LiFeTech's batteries in racing cars.

The company is working on a strategy to expand its battery business into renewable energy, but Wiley said that already last week, during the Solar Power International 2009 show in Anaheim, Calif., Aide Solar was able to discuss a specific deal with a company that would like to integrate storage for portable solar applications and LED lighting.

In large-scale solar arrays, storage can tackle the issue of clouds, which when they cover a large installation can cause "serious voltage swings," said EPRI's Rastler. "Lithium-ion could be a solution, but there could be others. We're looking for what's the most effective technology out there," he said.

In distributed photovoltaic applications, such as parking garages with solar panels, a storage unit could be needed to charge electric vehicles faster, said Rastler. And then there's the issue of peak power, which would mean storing power produced during the hours of most light to deliver it to customers when consumption peaks, usually between 4 p.m. and 8 p.m.

Some of these issues, such as the cloud coverage, could be tackled with technologies that don't require long-term storage, said Rastler, so lithium-ion isn't the obvious choice all the time. "Flywheels can do very efficient cycling...it could be a shock

absorber," he said. "There are also ultracapacitors as well as flow batteries -- their advantage is they can deliver a lot more energy, and the dollar-per-kilowatt-hour is lower than a lithium-ion system."

Another research effort looking at alternatives for energy storage for solar energy systems is France's oil company Total S.A. On Tuesday, Total announced it will invest \$4 million over five years in a research project with the Massachusetts Institute of Technology's Energy Initiative to develop a low-cost, long-life battery to enable the storage of solar power.

MIT researchers weren't immediately available for comment.

Total's solar investments include Photovoltech, a maker of crystalline silicon photovoltaic cells; Tenesol, a designer, manufacturer and operation of PV systems; and start-up Konarka Technologies, a thin-film solar developer.

<http://www.panjit.com>

<http://www.epri.com>

<http://www.total.com>

<http://www.aidesolar.com>