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How energy storage can change the power dynamic

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The construction site for Tesla Motors' lithium-ion battery manufacturing plant in Nevada -the Gigafactory -is a mile long and can be seen from space. From this vantage point it is clear that the electric vehicle innovator is taking an expansive view of energy storage - which includes not just transportation but stationary applications as well.

"There is a lot of opportunity out there," Greg Callman, who manages market entry and business development within Tesla's stationary energy storage division, said Tuesday during a panel on grid-scale storage at the GreenBiz Group's VERGE conference in San Francisco.

But just how expansive is the market for energy storage?

"For years people have been calling it a ‘zero-billion dollar market,'" joked Callman. "Everybody knows it's in the billions."

While estimates vary wildly-apparently from zero- to triple-digit billions over the next decade-Tesla was among a host of battery storage companies represented at VERGE that detailed how stationary storage markets are coming into view. This includes both grid-scale storage for wholesale power markets and distributed energy storage for retail markets.

A growing number of companies are offering services to these markets, such as reducing peak power prices, providing backup and emergency power, and stabilizing rising volumes of variable wind and solar resources.

Tesla's stationary energy storage program leverages advanced technology from the company's vehicle program to create a non-containerized product for larger applications that "looks a lot like a 500 kV transformer" and ranges in capacity from "a couple hundred kilowatts to the megawatt scale," Callman explained.

"Tesla is looking at both sides of the meter," he said, noting that the company is working with SolarCity on solar-plus-storage leases for distributed energy markets, which could include residential, commercial and industrial customers.

Pairing solar and storage

New Jersey-based Solar Grid Storage, as its name implies, also is combining solar power with storage, relying on lithium-ion batteries and power inverters packaged inside shipping containers with a capacity of 150 kilowatts to 10 megawatts.

Tom Leyden, the company's chief executive, who was a veteran in the solar photovoltaic industry before founding Solar Grid Storage, says the nascent battery storage industry is learning from the market expansion of the PV industry, which over the past decade has radically reduced its prices and expanded its market exponentially.

"There is a desire to have storage, but how do you make the numbers work? That's what Solar Grid Storage is focused on," Leyden said Tuesday in a separate panel discussion at VERGE. Just as he did when he worked for solar industry pioneer PowerLight - which was later acquired by SunPower - Leyden is creating detailed value propositions to facilities owners and other potential investors who may think energy storage is too expensive based solely on capital costs.

"How do you build the pro forma to give investors 10- to 15-percent [returns]? That's what we see they need in order to make these investments. So that's the trick right now," said Leyden. "You will see the cost of storage coming down. You will see different ways to monetize PV plus storage. And you will see a lot more adoption of storage in the next five to ten years."

According to Bill Watkins, CEO of Imergy Power Systems, which specializes in a vanadium-based battery technology, the big energy storage markets currently are outside of the United States.

"Microgrids and energy storage is happening faster outside of America than it is here because half the world still gets its electricity from diesel for the most part and they have poor grids," he said at VERGE on Tuesday.

The company, which yesterday announced a manufacturing agreement with leading contract manufacturer Foxsemicon to produce its batteries, is active in markets such as Russia and India.

"If you can get your levelized energy cost under 30 cents per kilowatt hour, you are in the game. If you can get under 20 cents per kilowatt hour you've got a home run. In many places around the world that works," he said. While storage is gaining traction in the U.S., in states such as New York, California and Hawaii, there is still a ways to go in most other states.

‘Phenomenal opportunity' and fundamental challenge

"There is phenomenal opportunity in California within the next 10 years," said Watkins. Within that timeframe, the Imergy chief executive anticipates Californians will have access to affordable, renewably powered microgrids.

"It will change radically how we use energy in California."

Watkins believes this will undermine utilities, even if some of them are engaging in microgrids.

But if the coming of age of battery-based energy storage represents a fundamental challenge for utilities, it will not be easy for energy storage companies either, said an industry participant during a workshop on Monday.

"Right now in the investing world, the hottest technology in terms of new investment is batteries," said the participant, who spoke under the meeting's Chatham House Rule of anonymity.

"We are funding more and more new battery startups. Everybody thinks they can solve the problem of creating low-cost batteries. The reality is at some point it will get scaled by the Chinese, Koreans, Japanese or maybe even by Tesla's Gigafactory. Costs will get driven down very low. There will be massive carnage among the companies. Ultimately we will benefit. But that's a tricky place for opportunities."