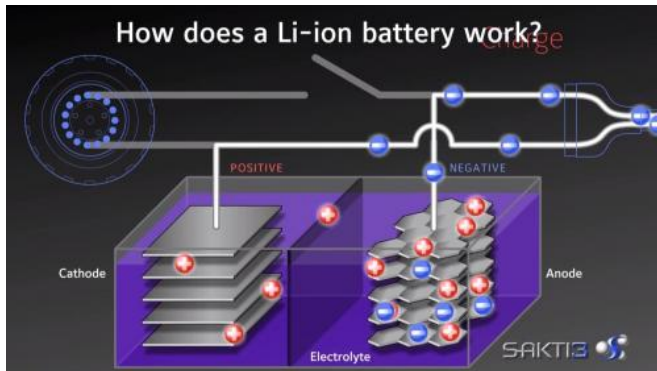


Dyson likes what he sees in solid-state battery company

17 March 2015, by Nancy Owano



Michigan-based Sakti3, a spinout of the University of Michigan, is set on commercializing a breakthrough solid-state battery technology that would deliver high performance. The company working on their early prototypes started on simple equipment, with the self-challenge to produce "great battery cells on equipment that was not overly specialized." They worked to make sure that everything they did could be scaled.

The founding team created laboratories, published over 80 papers on [battery](#) technology and demonstrated their early prototypes. Today, they said, the production methods they use show very high [energy density](#) battery cells. They aim to build batteries for all kinds of applications. The latest news about them came this month from Samuel Gibbs, *The Guardian*. He said Dyson is investing \$15 million in the battery technology; one day we could be looking at double smartphone battery life and electric cars driving over 600 miles per charge.

Car and Driver said the company draws "closer to producing a different variety of lithium-ion battery that promises to be more powerful, lighter, and less

expensive than today's lithium-ion cell." The article said they sought "to develop a plan to produce their new lithium-ion battery not from a spec sheet, but from an easily scalable manufacturing process." Alexander Stoklosa said they were not married to any single assembly process or internal constituent materials, keeping their minds open to come up with the most realistic "[alchemy](#) of manufacturability and battery performance."

He quoted Sakti3 CEO, Dr. Ann Marie Sastry, who recalled how they "cycled through a number of choices computationally to come up with a combination that would theoretically offer high energy density and also be manufacturable on a scalable platform."

In August last year, CEO Sastry told Seth Fletcher in *Scientific American* that the company's prototype solid-state lithium [battery cells](#) reached a record energy [density](#) of 1,143 Watt-hours per liter— "more than double the energy density of today's best lithium-ion batteries." Fletcher wrote about their technology path. He said the vacuum deposition process that Sakti3 uses to manufacture its cells is different from the process used by most battery makers. *The Guardian* report said that Sakti3's solid-state technology uses solid lithium electrodes, not a liquid mix of chemicals, which doubles the amount of energy that can be stored in a battery.

In the August piece in *Scientific American*, Fletcher discussed their work. "Sometime in 2006, Sastry and her colleagues began doing complex mathematical optimization schemes trying to figure out which of the many competing variables that go into an electric car battery—energy, power, mass, volume, cost, safety—could give. Their calculations told them to get rid of the liquid electrolyte found in conventional lithium-ion batteries, along with all of the extra packaging that a liquid electrolyte entails."

Carly Page in *The Inquirer* said, "Sakti3's solid-state technology switches out reactive liquid

compounds for solid lithium electrodes, storing 1,000 watt hours per cubic liter - compared to the 620 cubic liters stored by [lithium-ion batteries](#). What's more, Sakti3's batteries are expected to be affordable to mass produce and safer than sometimes-combustible liquid-based batteries, with flammable liquid electrolyte [removed](#)."

To be sure, key industry sectors would feel the rewards of better battery technology including manufacturers of smartphones, cars and home energy systems.

Implications for business are not trivial. Cliff Kuang in *Wired* commented that "changes to core technologies such as batteries have the potential to reset entire [industries](#), giving newcomers the chance to upend leaders, in a way that's almost impossible when an industry is on the cycle of incremental improvements."

"Sakti3 has achieved leaps in performance, which current [battery technology](#) simply can't," said company founder James Dyson according to *The Guardian*. "It's these fundamental technologies – batteries, motors – that allow machines to [work](#) properly."

Kevin Bullis remarked in *MIT Technology Review*: "Success isn't a sure thing. Making a few prototypes might not translate to high yields in a factory, where [conditions](#) and raw materials can vary. But the partnership with Dyson, which has manufacturing experience and relatively deep pockets, could make the transition easier for Sakti3."

More information: sakti3.com/

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