

A black powder for electric cars

BY ROLAND LINDNER, NEW YORK - UPDATED JULY 29, 2019 - 08:10



Batteries are the most valuable part of an electric car – and one of the major weak points. One of the first Tesla employees has founded a new company that seeks to change that – and it is making German car manufacturers sit up and listen.

Located in Silicon Valley, California, Stanford University runs a well-established program that involves students developing and racing solar-powered cars. Gene Berdichevsky, studying mechanical engineering at the time, built such a vehicle as part of a team on the program in the early 2000s, and for him the project sparked a lifelong fascination: “I fell in love with energy,” he says today. What interested him most was the aspect of efficiency – for example, questioning how energy consumption can be kept as low as possible.

At 35, he now works at Sila Nanotechnologies, a battery engineering specialist based near San Francisco that promises to revolutionize [batteries](#), whether in cars or electronic devices such as smartphones. Thanks to a material developed by Sila, batteries are set to become more powerful, cheaper, and more reliable too.

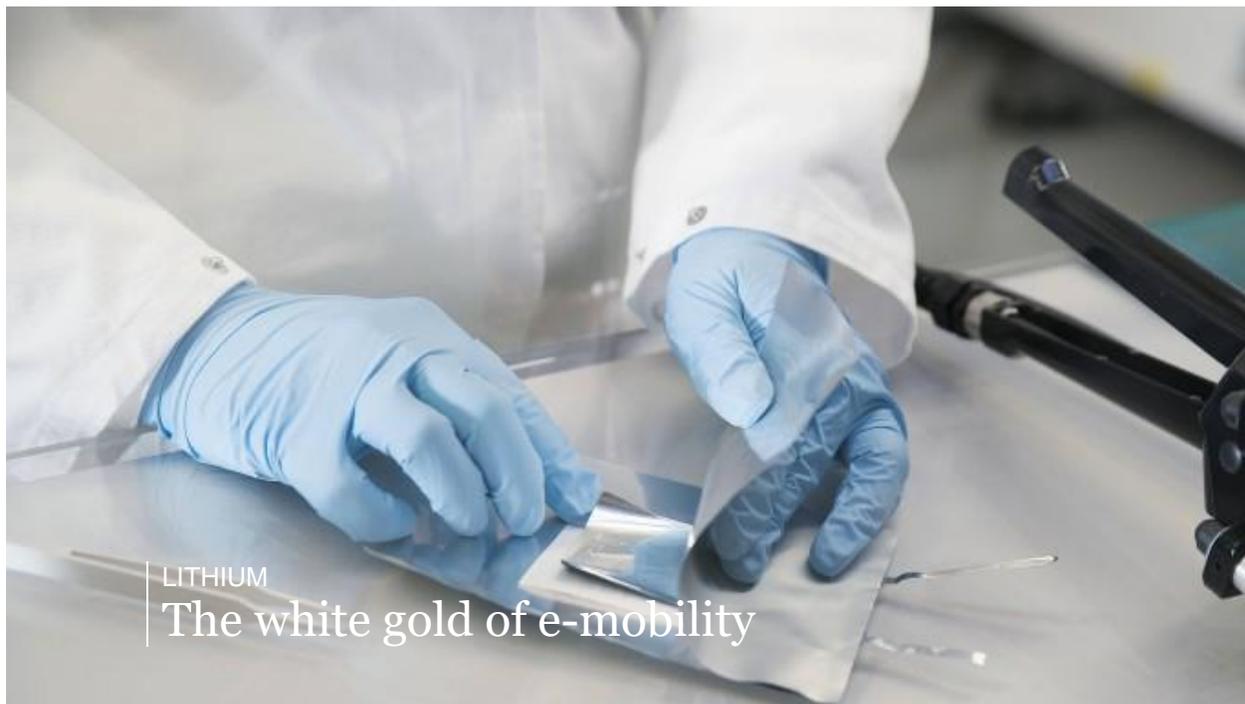
This prospect is encountering a great deal of interest from the automotive industry: A few months ago, Stuttgart-based Daimler Group brought on board a group of investors that gave Sila \$170 million, taking a seat on the company’s Administrative Board in the process. Sila also has an alliance with [BMW](#). Berdichevsky hopes that the two German automotive manufacturers will be among the first companies in their industry to use the new battery technology, as soon as it is ready for market. He is confident that they see

significant potential in going into partnership with him: “That money from Daimler certainly didn’t come out of their marketing budget.”

Tesla employee number 7

During his studies Berdichevsky already had ambitions to establish a company, and even wrote a business plan for it. In 2004 he dropped out of his studies – though first he took a detour via electric car manufacturer Tesla, becoming the company’s seventh employee. [Elon Musk](#) was not yet CEO at that time, but an investor and “very active member of the Administrative Board”. Berdichevsky would see him from time to time.

He was involved in the development of the battery system for Tesla’s first product, the roadster sports car; but after four years at the company he was ready for something new, and looking to work for himself. To prepare for this, he returned to [Stanford](#) and studied materials sciences, and this time he completed his degree.



Video: 2019 DW.COM,
Deutsche Welle, Image: obs

He wanted to know more about how battery capacity could be increased – a question that he had been considering while working at Tesla. He came to realize that the materials used must be one of the key considerations here, and Sila now engages with that very issue. He founded the company in 2011, together with Alex Jacobs (a former Tesla colleague) and Gleb Yushin (a professor in materials sciences at the Georgia Institute of Technology in Atlanta).

In terms of developing traditional lithium-ion batteries such as those used in [electric cars](#) as well as devices such as smartphones, Berdichevsky observes that very little notable progress remains to be made, estimating that their capacity may increase by one or two percent every few years.

Berdichevsky tells us that the Sila technology has demonstrated a 20% leap in energy density and, as such, capacity – and he asserts that there is even potential for a 40% increase. Such an improvement would enable the range of electric cars to be increased, for example, or batteries to be made smaller and therefore also cheaper.

This is an enticing prospect for the industry, as batteries are considered the most expensive part of electric cars. For example, Berdichevsky estimates that even the batteries for the smallest and cheapest Tesla vehicle – Model 3 – can today cost more than \$10,000 per vehicle.

Unbelievable things in the nano sector

The approach that enabled the leap in performance proclaimed by Sila involves replacing the currently established graphite in the anodes of lithium-ion batteries with silicon, which is widely available. However, according to Berdichevsky's description, intervening in the battery chemistry in this way is a tricky matter and has proven to be a process that takes years: Changes may have a positive impact on one parameter, but a negative impact on another.

Following many tens of thousands of tests, the company reports that it has now reached a solution in which it has confidence. Of course the material discovered presents none of the work behind it to the naked eye: "It looks like a black powder, but there are many unbelievable things happening at the nano scale."

It is reported that there is a pilot production run manufacturing it, and from there it is being sent to partners such as [Daimler](#) and BMW. Which means that Sila is now achieving its first modest sales. However, actual business operations will begin when mass production starts.

More than 100 patents

Berdichevsky hopes that time will come next year, though not yet for the automotive industry; it will initially be intended for small electronic devices such as digital watches and fitness trackers. He is aiming for use in electric cars by the middle of the next decade, and believes that this will constitute a larger business segment for Sila in the long run than consumer electronics.

As Berdichevsky points out, Sila has more than 100 patents on its technologies. Although there are competing attempts to improve battery technology, for example in the form of solid-state batteries, Berdichevsky believes that he has the advantage;

partly because – unlike some other approaches – Sila’s technology can be seamlessly integrated into existing production processes. The Sila CEO is certainly geared up for rapid growth. He says that the company’s workforce will grow from its current 125 to several thousand employees within the next five years.

Berdichevsky’s former employer Tesla is not yet one of Sila’s partners, although he is not ruling it out for the future. However, he is giving his current affiliates Daimler and BMW a good opportunity to establish themselves alongside Tesla in the electric car segment, and from conversations with managers there he gets the impression that they have plenty of “future-oriented momentum”. Although beyond Tesla the sold quantities of electric cars have been limited so far, he believes that the transition to electromobility will be significantly faster than is widely expected today. He also states that car manufacturers that are not prepared for this will have no chance of survival.

Source: F.A.Z.

You can acquire rights to this article [here](#).