

ENERGY & ENVIRONMENT

Lithium Producer Chases Tesla's Bold Battery Plan

By ERICA GIES MARCH 16, 2014

Last month, Tesla Motors, the maker of high-end electric cars, announced plans to open the world's largest battery plant in 2017. The goal is to overcome what it calls the biggest obstacle to meeting increased demand for its vehicles: a reliable supply of the advanced batteries that power them.

To accomplish that, Tesla will need plenty of battery-grade lithium. That's where Simbol Materials comes in.

Simbol, based in Pleasanton, Calif., is preparing to break ground on its own commercial plant in August, which would put it on track to start production around the same time Tesla's plant is scheduled to open. The Simbol plant will be the first to use a unique process to extract lithium from a novel source: the waste from geothermal power plants.

Lithium demand is rising rapidly thanks to the growing need for lithium-ion batteries in electric cars, consumer electronics and energy storage. From 2000 to 2012, total lithium consumption grew an average of 6.4 percent a year, according to the United States Geological Survey.

About 35 percent of lithium chemicals sold are used in batteries, and Tesla's plant would almost certainly increase that figure. The automaker aims to produce 30 gigawatt-hours of battery capacity a year, which is more than the total produced worldwide in 2013, according to Cosmin Laslau, a research analyst in energy storage for Lux Research.

"Supporting another lithium supplier in the market at the time when that rapid growth occurs in 2017 and beyond, with a real inflection point in 2020, couldn't have worked out better," said Josh Green, general partner with Mohr Davidow, a venture capital firm in Menlo Park, Calif., that is Simbol's largest shareholder.

Historically, lithium has been mined from hard rock or concentrated into brine via months of evaporation from salt water, then converted into usable form through a chemical process. Both forms of production are time-consuming, messy and relatively expensive.

Since 2011, Simbol's pilot plant in Calipatria, Calif., has extracted about 100 metric tons of lithium from the brine of the 49.9-megawatt Featherstone geothermal plant in the Imperial Valley of California. Brine is a mix of salt and water and can contain varying amounts of dissolved solids, including lithium. After the geothermal plant generates energy, but before it injects the waste brine back underground, Simbol uses the hot brine as feedstock for its chemical process.

"The brine comes out of the ground, electricity is produced, elements will be taken out of the stream, and the brine will go back in the ground," said Joseph Lowry, vice president for sales and marketing at Simbol.

The fact that the brine is preheated reduces costs and the energy footprint relative to conventional lithium production methods, Mr. Lowry said. Because the geothermal companies have an exemption from water laws, which allows them to pump their brine back into the ground, the process also spares Simbol potential cleanup or environmental mitigation costs. "We don't want this stuff above ground because it would be impacting water tables," said John Burba, Simbol's chief executive since April 2013. "But this goes back into the formation where it came from."

Mr. Burba is a co-inventor and lead developer for the basic lithium extraction technology that Simbol is using, which he helped develop while he was working for the chemical manufacturers Dow and FMC. Simbol now owns patents and pending applications on refinements of this filtering process.

Brian Jaskula, a lithium specialist with the United States Geological Survey in Reston, Va., said Simbol's process was a well-guarded secret, making it hard to evaluate the technical merits. "If it does what they say it does, it seems promising," Mr. Jaskula said.

What appears certain is that there are plenty of resources to be extracted. Brine from Southern California's geothermal plants is rich in lithium, and in manganese, zinc and potassium, according to a hydrologist specializing in minerals contracted by Simbol. And geothermal energy production in the region is expanding.

Mr. Jaskula is optimistic about Simbol's chances, even though several other emerging contenders hope to start producing

lithium as soon as this year and could beat Simbol on price, as the company has not yet revealed a breakdown of its production costs. That is because a stable supply, not price, is the critical factor for battery manufacturers, Mr. Jaskula said. "Lithium is only 2 to 3 percent of the battery's content as well as the price of the battery," he said. "But it's so important that the price doesn't matter as much as having a variety of sources to ensure that they do not run out."

Simbol says the plant will have the capacity to produce 15,000 metric tons of lithium annually. The permits are ready, Mr. Burba said, and Simbol has secured the water necessary to operate the plant — no small feat in dry California — from the Imperial Irrigation District, which has set aside water to attract industry.

Simbol is raising the last 10 percent of the financing necessary for plant construction, Mr. Burba said, and is working to complete plans of its engineering and selection of equipment. Simbol will initially produce lithium carbonate and lithium hydroxide, both of which are used in the lithium-ion battery sector. They will most likely be sold to lithium cathode manufacturers, who then sell to battery producers.

But Tesla's plant is on the horizon, and Mr. Burba said he hoped to have Simbol ready to supply it when the opportunity comes.

A version of this article appears in print on March 17, 2014, on page B3 of the New York edition with the headline: Lithium Producer Chases Tesla's Bold Battery Plan.