

Tesla factor: Recharging Nevada's lithium industry

Jason Hidalgo, RGJ 7:08 a.m. PDT April 6, 2014



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Drive northwest from the heart of Winnemucca and you will reach a pockmarked piece of land just 30 miles from the Nevada-Oregon border.

Take away the remnants of more than 200 exploratory drill holes and you're left with a rural landscape that looks just like any other in Humboldt County.

Beneath all that sagebrush and dry dirt, however, lies a metal that could potentially charge the Silver State in more ways than one.

It's a project that represents a \$40 million gamble so far for Western Lithium. That's how much the company has spent to prove the existence of a resource that's seeing increased demand in a technology-hungry world: lithium.

Western Lithium plans to spend even more. If it gets government approval, the company says it will invest up to \$300 million on lithium mining and plant operations.

With the advent of smartphones and other portable devices, lithium saw its value skyrocket tenfold from 2000 to 2010 before stabilizing to \$6,000 per ton in recent years, according to U.S.-based development company Lithium Exploration Group.

What's truly energizing interest in domestic lithium production, however, is the prospect of Tesla Motors' ascendance, along with a massive \$5 billion Gigafactory that is being pushed by its chief executive officer, Elon Musk.

Designed to reduce battery costs by 30 percent, the Gigafactory is Tesla's not-so-secret weapon in producing a more affordable, mass-market electric car. For industry watchers, however, the move also translates to a lot more demand for lithium.

In a note sent to shareholders in late March, Lithium Exploration Group CEO Alex Walsh said Tesla is expected to consume up to 15,000 additional tons of lithium carbonate once its Gigafactory operations are in full swing in 2017. To put the amount in perspective, total global demand for lithium carbonate in 2012 was around 160,000 tons, according to international metals and minerals research and consulting firm Roskill.

"It's just a matter of time before electric vehicles take over the market," said Dennis Bryan, senior vice president of Western Lithium. "Given the continued growth factor in lithium, we expect demand to increase substantially."

Meanwhile, the only commercially active lithium mine in the United States is in Silver Peak, Nev., according to the U.S. Geological Survey. The site is operated by Rockwood Lithium, a major producer that also has operations in Latin America.

Although the bulk of the world's lithium supply comes from countries such as Chile and Argentina, proponents of a domestic industry say Nevada is no slouch. Western Lithium claims the Humboldt County site's deposits represent the fifth-largest lithium resource in the world. The Nevada Governor's Office of Economic Development says the state's overall lithium portfolio is even bigger.

"Nevada is lithium rich — second only to the size of deposits found in Chile," said Steve Hill, executive director of the Governor's Office of Economic Development.

With Nevada also on the short list of states that could land Tesla's Gigafactory, the state could be looking at a potential lithium boom should everything fall into place. Some experts, however, express skepticism about the prospects of building a strong lithium industry in Nevada, even if a Gigafactory deal goes through.

"Yes, there's nothing else in the U.S. besides Nevada (for lithium production)," said Edward Anderson, president and CEO of international technology and consulting firm TRU Group Inc. "But a Nevada operation would be more costly to run than one in Atacama (Chile). It's a question of cost-competitiveness."

Leading the charge

First discovered in 1817, lithium is the lightest metal on the periodic table. It also has high energy density, allowing it to generate the same amount of power at a fraction of a lead-acid battery's weight.

Although prized within the battery industry, nearly a third of the world's lithium supply is used for ceramics and glass, according to the U.S. Geological Survey. Battery use is second at 22 percent.

Historically, low demand and poor economics made lithium production less attractive. This was especially true in the United States, which has to compete against lower-cost operations overseas. Even as pricing rose significantly due to increased demand, the recent recession and concerns about oversupplying caused lithium prices to stabilize in recent years.

As talk heats up about cars with electric drives, however, lithium proponents are starting to adopt a more bullish tone.

In 2010, for example, hybrid cars accounted for 274,210 of the 11.6 million vehicles sold in the United States, according to the Electric Drive Transportation Association. Pure electric cars barely registered at just 19 sales.

Fast forward to last year and hybrid sales jumped to 495,530 units, outpacing the growth of the overall auto market's 15.5 million in total sales. The biggest percentage increase, however, was posted by plug-in cars. Total sales of plug-in vehicles in 2013, including full electrics and extended-range cars, was 96,702 units.

Further fueling interest among lithium proponents is Tesla's Gigafactory, which many see as the spark to finally getting electric cars into the mainstream. Add Tesla's "vertical integration" approach to business — which emphasizes a more consolidated supply chain and sourcing as many components as possible domestically — and the prospects of local lithium production are looking up, according to CEO Walsh of Lithium Exploration Group.

"I expect that (lithium demand) will change rapidly, perhaps more rapidly than people can quantify, because the amount of lithium needed in a car battery is 100 times the amount needed for a laptop computer or tablet," Walsh said in a statement. "I believe that Tesla will begin to acquire as much lithium supply as it can get its hands on in North America to further the vertical integration of ... electrical vehicle production and insulate it from price volatility."

Recent moves by lithium mining companies in Nevada reflect the bullishness in domestic production.

Rockwood invested \$75 million in an expansion of its U.S. lithium production, including brine pond operations in its Silver Peak site in Nevada. Pure Energy Minerals, a lithium mining company with deposits near Tonopah, recently announced an agreement with South Korean multinational steel firm POSCO. CEO Kwon Oh-Joon of POSCO considers electric vehicles as a driver of future growth.

Then there's Western Lithium, which estimates production of up to 20,000 tons of lithium carbonate per year over two decades from the Humboldt County site.

"Once the lithium mine is built, we expect to employ 100 to 150 people in the mine and the plant," Bryan said. "We've got the economic incentive to say that we can produce lithium and make a profit."

Tough race

Not everyone, however, is hopping aboard the domestic lithium bus.

After seeing his fair share of lithium companies make claims about supplies in Nevada and either misleading investors or folding outright, Anderson of TRU Group is a lot more skeptical about domestic lithium prospects.

Anderson points to American Lithium as an example of a high-flying lithium company that made grand claims about a project in Nevada and then fizzled out.

"That company claimed to be the savior of American lithium supply — almost the same way that Tesla is being called the savior of the battery industry in America," Anderson said. "Now you can't even contact them anymore. I honestly don't even know what happened to them. They just vanished."

Only Western Lithium appears to be a viable project in Nevada at this point, Anderson said. At the same time, Anderson also described Western Lithium's plan to extract lithium from hectorite clay as opposed to the traditional brine ponds seen in Silver Peak and Chile as a long shot, at least from a cost-competitive standpoint.

Outside of Silver Peak, there are no other brine or salt lake opportunities in Nevada for lithium, he added.

Even Silver Peak is likely at the tail end of its days as a productive site, according to Anderson. With lithium production in the site starting in the 1960s, Silver Peak is basically running out of the material, he said.

"It was a good operation, but lithium concentrations have declined," Anderson said. "I'm actually surprised that Rockwood expanded operations because that site will be likely gone in 10 years. Silver Peak is even processing lithium brought in from Rockwood's South American operations these days."

Bryan of Western Lithium confirmed that there were about 10 companies looking at lithium in Nevada just a few years ago. That number is way down since then, he said.

"I guess they didn't find the lithium," Bryan said.

At the same time, Bryan expressed confidence in his company's ability to extract lithium from hectorite clay. The process also comes with an added benefit. Hectorite can be used as drilling mud by the oil and gas industry, including high-demand operations such as fracking, Bryan said.

Western Lithium is already in negotiations with various drilling companies and will build a hectorite processing plant in Fernley by this summer. The plant will supplement the company's portfolio while it works to get permitted for a lithium mine, which could take several years — another disadvantage for domestic operations.

With most mining facilities in Nevada on federal land, getting approval can be a drawn-out process, according to Hill of the Governor's Office of Economic Development.

"When competing with other countries for operations, factors such as the time it takes to receive permits, the regulatory environment and the overall health of the economy play big roles," Hill said. "It can take seven to 10 years to permit a facility in the U.S. — often much longer than in other parts of the world."

A local boon?

Despite its challenges, improving lithium production in Nevada is a shot worth taking, according to proponents.

For rural areas, the benefits could especially be significant, said Di An Putnam, mayor and lifelong resident of Winnemucca.

Besides bringing jobs and adding much-needed diversification amid the area's gold and silver mining operations, lithium also adds a green component to an industry that normally is not associated with environmental friendliness.

"It gives us added visibility and helps shed a positive light on our community, given the push for green energy," Putnam said. "By being associated with a product that can be used to create a clean-air atmosphere, this would hopefully be a win-win for us."

The competition for Tesla's Gigafactory is another good case for a strong lithium industry in the state, Bryan said. Even if Nevada does not succeed in getting Tesla's high-profile battery factory, it could find itself in the running for related industries as the electric car market takes off.

"Battery manufacturers still like to be close to the source," Bryan said. "The lithium battery is still one of the heavier components of an electric vehicle, so if you build it closer to the source, it's more economical because you can keep costs down."

Increased lithium demand from the Gigafactory — regardless of where it ends up — could also benefit Nevada. Still, Tesla's 2017 target means it will have to procure materials from international sources. Nevada does not have the critical mass in lithium production necessary to supply all of Tesla's needs or attract other industries, for that matter.

"The majority of lithium is still coming from overseas," Hill said. "Having lithium in the state provides benefit, but, in and of itself, not enough to cause companies to choose Nevada."

Despite his skepticism about a robust lithium industry in the United States, Anderson understands the attraction. Besides lithium, electric car batteries also need other base materials such as cobalt oxide and graphite. One of the leading suppliers of cobalt oxide is Russia, which Anderson identified as a risky nondomestic source for materials.

"One thing Tesla has to be sure about is the quality and reliability of its materials, and there's no place better than America for reliability," Anderson said. "I think China and Russia can be labeled fairly as unreliable trading partners. Perhaps one of the good things that can come out of this is that it will spur American producers into action."

WHAT IS LITHIUM?

- Lithium is an element first discovered by Swedish chemist Johann August Arfvedson in 1817. It is a silvery white metal in its pure form.

- Is the lightest and least dense metal in the periodic table but also has high energy density, making it a popular material for batteries. It can generate the

same amount of power at a fraction of a lead-acid battery's weight, for example.

- The use of lithium in batteries was first proposed in the 1970s. The first commercial battery was released in 1991.

- Lithium is not seen freely in nature. Instead it is mixed with something else. The most common sources are crystals and brine pools. Because the metal is highly reactive, it is often mixed with carbonate to form lithium carbonate.

- About 160,000 tons of lithium carbonate are produced each year.

- Rockwood's Silver Peak site in Nevada is the only commercially active lithium mining operation in the U.S. Most of the world's lithium supply comes from South America.

- About 30 percent of the world's lithium supply is used for ceramics and glass. Battery use is second at 22 percent but is considered as the leading growth opportunity for lithium.

Source: RGJ research

CARS GET MORE ELECTRIC

Traditional gasoline cars still account for the great majority of vehicles sold each year in the United States. Hybrids and electric cars, however, are showing significant progress in the last few years. Here's a snapshot of hybrid and plug-in car sales in relation to total auto sales.

2010

Hybrid: 274,210

Plug-ins: 19

All cars: 11.5 million

2011

Hybrid: 266,329

Plug-ins: 10,064

All cars: 12.7 million

2012

Hybrid: 434,645

Plug-ins: 52,835

All cars: 14.4 million

2013

Hybrid: 495,530

Plug-ins: 96,702

All cars: 15.5 million

2014 YTD*

Hybrid: 57,646

Plug-ins: 12,950

All cars: 2.2 million

<http://www.rgj.com/story/news/2014/04/06/tesla-factor-recharging-nevadas-lithium-industry/7354627/>