
Developers seek to tap hot brine beneath Texas for lithium, geothermal power

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Cattle graze on a ranch near Mt. Pleasant, Texas. T5 Smackover Partners is developing a geothermal and lithium extraction project across 10,000 acres in the region. Source: Buyenlarge/Contributor/Archive Photos via Getty Images.

A handful of developers are aiming to tap into deep-underground brine in East Texas to meet two growing needs in the energy sector: lithium and around-the-clock clean power.

The design of these projects is like that of any other geothermal power system, according to Cole Fisher, president and co-founder of T5 Smackover Partners. Hot brine is pumped to the surface, where it is converted into steam to spin an electricity-generating turbine.

The difference is that the brine is then further harvested for lithium and potentially other minerals, before being injected thousands of feet underground again.

Stakeholders see the business model as a means of mitigating the risk of geothermal energy development while meeting battery makers' demand for lithium carbonate.

"Is this a more economically feasible way to go about creating geothermal energy at scale? The answer, quite frankly, is yes," Fisher said. "The same well that you're drilling that's going to achieve geothermal energy is also bringing up with it brine that is so dense with critical minerals."

T5's flagship project lies above the Smackover Formation, a Jurassic-era limestone formation extending from East Texas to the Florida Panhandle. The company has secured 10,000 acres of leases in Franklin and Titus counties, Texas.

T5's CEO, Bruce Thompson, a serial entrepreneur in the automotive sector who has sold companies to CDK Global LLC and CarGurus Inc., initially bought part of that land to build a family ranch. Only later did Thompson discover the potential mineral value of his investment, according to Fisher.

"Some landmen knocked on the wrong guy's door," Fisher said. "They wanted to lease his mineral rights, and Bruce, being the sage entrepreneur that he is, was like, 'What's going on here? There hasn't been oil out here since the '40s.'"

Shortly thereafter, Thompson founded T5, joining forces with Fisher, who previously led low-carbon business development at GE Vernova Inc. The three-year-old venture aims to produce geothermal power for behind- and in-front-of-the-meter applications while mining lithium and potentially other minerals, including potassium and strontium.

Earlier this year, T5 secured an offtake deal with mining giant Glencore Ltd. Under the agreement, T5 will supply 5,000 metric tons/year of lithium carbonate, the total expected yield of its phase-one operations, over a five-year term. The private development company expects to start producing lithium next year, along with about 10 to 20 megawatts of geothermal power, which will mostly be used on-site, Fisher said.

Later, T5 plans to correspondingly increase its electricity and lithium output. The company expects to use some of that power for its own future projects, such as new electric-vehicle charging stations along the Interstate-30 corridor, Thompson told Platts, part of S&P Global Energy. The company also envisions supplying geothermal energy for local industrial use.

Another developer, GeoFrame Energy, and its drilling partner Halliburton Co. expect to start construction in East Texas before year-end, GeoFrame CEO and co-founder Bruce Cutright said in an interview. Production is expected to begin by early 2028. The project's first phase is targeted to yield 10,000 mt of lithium carbonate, 100% of which is already under contract to two undisclosed customers, Cutright said. The heated brine will also be used to generate about 4 to 5 MW of geothermal power to run the direct lithium extraction facility.

Eventually, GeoFrame plans to expand the project's annual output to up to 85,000 mt of lithium carbonate and up to 34 MW of geothermal power. While the project's equipment will still need much of that power, Cutright expects that about 10 MW of surplus electricity could be sold to the local grid.

Prior to founding GeoFrame, Cutright worked as a research associate at the University of Texas **Bureau of Economic Geology**, studying how the oil and gas industry's newest drilling techniques could be applied to geothermal production.

"We formed GeoFrame Energy to really transfer technology from the petroleum companies to the geothermal energy field," Cutright said.

Unlike wind or solar power, geothermal energy can be generated around the clock. Geothermal production also has long-term tax benefits, having been spared from President Donald Trump's clean energy subsidy cuts in 2025. But the core function of GeoFrame's East Texas project will be lithium production, Cutright said.

"We can sell our power at someplace around 10 cents a kilowatt hour. So, if we're selling 10 megawatts, that represents a significant income stream," Cutright said. "But it doesn't compare to the income stream that the sale of the lithium will produce."

Market competition

Neither geothermal power generation nor direct lithium extraction has ever been deployed at scale in the US Gulf Coast region. But T5 and GeoFrame are not the only companies eyeing the Smackover Formation, particularly in East Texas and Arkansas. Standard Lithium Ltd. and oil majors ExxonMobil Holdings Corp. and Chevron Corp. have also acquired leases in the region for lithium brine projects.

"What we're doing there is trying to draw on our core capabilities," Sasha Mackler, global head of strategic policy within Exxon's low-carbon division, said at the National Clean Energy Week conference in Washington, DC, on Sept. 16. "With lithium, it is our drilling capabilities and our process capabilities."

Geothermal upstarts like Sage Geosystems Inc. are also developing projects in Texas, though without the lithium component.

"Historically, geothermal has not been prevalent in the Texas electricity market because the price of bringing the heat up and creating steam and then making electricity has not been competitive with natural gas or coal or wind or solar," Barry Smitherman, chairman, president and co-founder of the Texas Geothermal Energy Alliance, said in an interview.

But advances in drilling technology are changing that market dynamic, added Smitherman, who has previously served as chairman of both the Texas Railroad Commission — which regulates oil and gas — and the Public Utility Commission of Texas.

Texas' geothermal power capacity "could be unlimited," Smitherman said. "It all depends on the market price at which these resources are being utilized."

Beyond the Gulf Coast, Controlled Thermal Resources Holdings Inc. is seeking to build a complex of geothermal power and lithium production plants near the southern shore of California's Salton Sea. An initial 49.9-MW phase of its Hell's Kitchen project was expected to enter service in 2025. But construction has been held up by lawsuits. In August, the California Court of Appeals ruled that the county did not sufficiently address environmental concerns when permitting the development.

Controlled Thermal Resources is one of several companies working on geothermal-lithium projects in the Salton Sea area.

Another company, oil producer Vulcan Energy Corp., has proposed to extract lithium from subsurface brine in Germany's Upper Rhine Valley. The project is expected to supply geothermal energy as a co-product for local heating needs.

'Maybe in five to 10 years'

Not everyone is convinced that geothermal brine projects are ready for commercial-scale lithium production. Kyle Stevenson, CEO of NEXT Lithium Corp., said conventional evaporation ponds remain the more established option for investors.

"Maybe in five or 10 years we'll have lithium being produced from geothermal brine. But right now, the smart money is going into the projects that have traditional ponds, that's proven and they know it's going to work," Stevenson told Platts.

Executives recognize that lithium demand is rising rapidly, driven in part by battery energy storage systems and data centers. This is creating opportunities for a range of production methods, including geothermal brine.

"I think demand for lithium is going to increase so much that we're going to need all the different lithium projects to be built just to meet that demand. Whether it's traditional evaporation ponds, geothermal brine or clay projects being developed in the US," Stevenson said.

Proponents of direct lithium extraction argue that the process is less damaging to the environment than conventional lithium mining.

"The extraction of lithium from brine is basically a chemical reaction. And that's about all," Cutright said. "It's a closed loop. There's no emissions. You don't have to worry about moving massive amounts of dirt."

Fisher noted that Thompson's family still lives on the land T5 is developing. "His ranch is right in the middle of it," Fisher said.

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