In The News
Texas grid panel digs into next-generation geothermal power potential

Markham Watson
859 words
22 September 2025
Platts Energy Trader
NRGTRD
ISSN: 1545-1127
English

* State is ‘dominating geothermal revolution’

* Federal bill generates momentum

Texas’ experience with oil and gas exploration has facilitated the state to become the nation’s center for next-generation geothermal power generation and storage that could meet surging data center power demand “cost effectively,” experts told Electric Reliability Council of Texas board members Sept. 22.

“Texas is really dominating this geothermal revolution right now,” said Ken Wisian, associate director of the environmental division at The University of Texas at Austin’s **Bureau of Economic Geology**. “And we have great potential like we've done many times in the past to lead an energy revolution for the whole country and world going forward.”

As a retired US Air Force major general, Wisian spoke to the ERCOT board's Technology and Security Committee about geothermal energy-related “military projects going on in Texas.”

“The Department of Defense has jumped in with both feet and is extremely enthusiastic about geothermal potential,” Wisian said. “The Air Force rates geothermal as their #1 future energy source even above small modular reactors. And then there's also civil projects going on around the state.”

No 'unicorn geology' needed

Conventional geothermal generation relies upon “unicorn geology” such as volcanic activity near water sources that can be used as propellant for turbines, and permeable rock from which the steam can flow, said Cindy Taff, CEO of Sage Geosystems, a Houston-based startup. Sage and other new geothermal companies are pursuing “next-generation geothermal,” Taff said.

“For next-generation geothermal, you're looking for heat,” Taff said. “You don't need the water, you don't need the permeability because what you're doing is creating artificial reservoirs deep in the earth, which the oil and gas industry knows how to do. You're pumping water from the surface into that reservoir to harvest the heat and then bring that heat to surface. Next-generation geothermal actually extends the US addressable geothermal resource from gigawatts to terawatts.”

If such a reservoir is established at sufficient depth to get temperatures between 300 to 350 degrees C, two wells could produce 35 MW.

“So, huge potential, a huge way to get very large-scale, reliable 24/7 baseload power,” Taff said. “Conventional geothermal has built maybe five to 20 wells a year across the US, whereas next-generation geothermal is poised to be kind of like the ‘unconventional shale revolution 2.0.’ We're going to need to drill many, many wells.”

But geothermal generation requires much less surface area than wind or solar resources, said Drew Nelson, Austin-based vice president for policy, programs and strategy at Project Innerspace, a nonprofit focused on next-generation geothermal energy.

“It's a huge opportunity and one that is ripe for picking and one that Texas yet again can lead on just as it's done with solar, just as it's done with battery storage, just as it's done with oil, just as it's done with gas,” Nelson said.

Nelson said next-generation geothermal could serve up to 4 GW of expected data center growth in the Dallas-Fort Worth, Austin and San Antonio areas of Texas.

Sage has a 3-MW, long-duration energy storage facility with the San Miguel Electric Cooperative south of San Antonio in Atascosa County, Taff said that could produce power for as long as 17 hours.

Tapping Texas' 'hot rock'

Barry Smitherman, chairman, cofounder and president of the Texas Geothermal Energy Alliance and former chairman of the Public Utility Commission of Texas, noted the state has abundant natural resources, including “hot rock.”

At extreme depths, extreme temperatures can be found “anywhere on planet Earth,” Smitherman said. “But ... there are certain areas of Texas where the hot rock is closer to the surface.”

For example, much of that near-surface hot rock is in the Eagle Ford Shale area from the state’s southern tip to San Antonio in central Texas and Corpus Christi and Houston on the Gulf Coast.

“That just happens to be where most of the load is in our state as well,” Smitherman said. “So the good news there is that we have a resource that is relatively close to load.”

Geothermal energy’s potential has surfaced as the state requires more dispatchable power and as “the shale revolution” has accompanied “advanced drilling techniques to get down to hot rock,” Smitherman said.

“It is a reliable 24/7 low-carbon resource for powering our economy,” Smitherman said.

Asked about “hurdles” in scaling up next-generation geothermal, Sage’s Taff said it depends on grid interconnection timelines, supply chains and capital.

But Smitherman cited the “flip side of the impediment coin” that Texas’ experience with drilling permits and its robust wholesale competitive market “that gives us the opportunity to put our power on the grid as the cost comes down.”

And the federal budget reconciliation bill signed into law July 4 extends geothermal resources’ tax breaks to 2030, while the shortening time lines for wind and solar to 2026, which “provided momentum for geothermal,” Taff said.

Document NRGTRD0020251006el9m0001w