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ENERGY & ENVIRONMENT

Benefits, feasibility of geothermal energy in Texas examined in new study

Geothermal, which is when heat is drawn from below the ground, requires drilling miles down into the earth. Recent advances have made geothermal energy more viable.

ARIEL WORTHY (HTTPS://WWW.HOUSTONPUBLICMEDIA.ORG/ARTICLES/AUTHOR/ARIEL-WORTHY/) | JANUARY 30, 2023, 4:52 PM

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FILE: Transitional Energy successfully produces geothermal energy at oil and gas well. A new study from several universities in Texas show the benefits of geothermal e

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A new study examined the potential of geothermal energy in Texas.

Geothermal, which is when heat is drawn from below the ground, requires drilling miles down into the earth. The heat comes largely from the core of the earth, which experts say is the same temperature as the surface of the sun.

Researchers from five Texas universities, in conjunction with the International Energy Agency and the University Lands office published the study. Ken Wisian is one of the authors of the study and researcher in the School of Geo-sciences at the University of Texas Austin. [He spoke to Craig Cohen on Houston Matters Thursday about their findings \(https://www.houstonpublicmedia.org/articles/shows/houston-matters/2023/01/26/441859/working-past-retirement-a-jan-26-2023/\).](https://www.houstonpublicmedia.org/articles/shows/houston-matters/2023/01/26/441859/working-past-retirement-a-jan-26-2023/)

“Humans have been tapping geothermal energy for thousands of years if you think of hot springs, and using it to produce electricity for about a hundred years,” Wisian said. “But up until the present day it’s been very restricted geographically. You have to go where nature concentrates the heat, like volcanoes.”

Wisian said the technology has come along to where now scientists think they can do geothermal energy anywhere. Currently the U.S. is the largest producer of geothermal energy at about 3 gigawatts, but the grid is so large, it makes up less than half of a percent of the total grid.

“The technology that is emerging now, and we’re in the prototype stage on, would allow us to drill, for instance, five kilometers – about three miles deep in Texas, and extract the heat and generate power,” he said.

Wisian said there are three advances that make geothermal energy more viable: speed and economy of drilling, conversion of heat into electricity, and the ability to decarbonize.

“There are various methods that are being explored right now to extract the heat,” he said. “Some use a greatly limited version of fracking, some drill a radiator pattern in the ground to extract the heat. So there’s a variety of methods that are at the prototype test drilling stage now.”

There are few downsides to geothermal energy, he said.

“The risk of induced seismicity is pretty low,” he said.

Induced seismicity, earthquakes caused by human activity, could be a concern, similar to fracking. But Wisian said last May a start up company that leads technology in geothermal.

“We had a seismic network arrayed round that site, and in their engineering of their simulation we saw no measurable seismicity,” he said. “So that was first test case, but we will need to continue to be open and transparent.”

So how far would we have to drill in Texas to be able to extract the same kind of geothermal energy in locations near volcanoes?

“Minimum temperature is around 300 degrees Fahrenheit, under Houston you hit that at about 4.5 to 5.5 kilometers down, about 3 miles,” he said. “But vary across the state.”

In east Texas, the coastal zone and far west Texas the areas are hotter. In Austin, it would require about 3.5 to 4 miles down.

This type energy could be responsible for about a quarter of the state's energy grid if Texas ever committed to it.

“For a good geothermal well, you could get about 3 megawatts of energy out of it,” he said. But Texas had about 15,000 wells a year during the height of boom. “The ability to scale up geothermal energy is tremendous.”

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