

XPrize competition to drive innovation for next-gen geothermal plants

Project InnerSpace and the XPrize foundation will launch a contest to remove technical bottlenecks and revitalize supply chains for geothermal's aboveground parts.



By **Maria Gallucci**
24 March 2026



An aerial view of a geothermal power plant in Redruth, England (Hugh Hastings/Getty Images)

Geothermal energy is rapidly advancing in the U.S. and globally, thanks to the arrival of next-generation technologies and skyrocketing power demand from data centers. Yet as more companies drill down deep to harness Earth's heat, the industry is poised to hit a major snag on the surface.

other components to generate and deliver electricity. But the limited supply chain and high cost of that equipment threaten to delay the industry's efforts to supply huge amounts of clean electricity around the clock, according to [Project InnerSpace](#), a geothermal research and advocacy organization.

On Tuesday, the group announced a new initiative with the nonprofit foundation [XPrize](#) to tackle that above-the-crust challenge.

XPrize will run a global competition to incentivize researchers and companies to design power-plant systems that not only require less time and money to produce than today's, but that also can be more readily installed across a wider range of geothermal projects.

Project InnerSpace will fund initial efforts to design the competition, though the full prize amount won't be announced until it officially launches this summer. The partners said they're talking with industry players at the ongoing CERAWEEK energy conference in Houston to develop key criteria for the contest.

The idea is to “unlock innovation that markets alone are too slow or too constrained to deliver,” David Babson, XPrize's executive vice president of energy, climate, and nature, said in a news release. XPrize has spearheaded nine climate-related competitions to date, including a [\\$100 million challenge](#) for carbon-removal technologies that was funded by Elon Musk's charitable foundation.

In the U.S., geothermal energy produces [just 0.4%](#) of total utility-scale electricity generation. Conventional technologies rely on naturally occurring reservoirs of hot water and steam that are found in only a handful of places, like California's [Geysers area](#) and Nevada's Great Basin.

However, recent innovations are [breathing new life](#) into the industry after decades of slow growth. [Enhanced drilling techniques](#) honed from oil and gas development, [novel closed-loop systems](#), and more [sophisticated mapping tools](#) are making it possible to access heat in deeper, hotter, and drier locations than traditional systems can go.

“The subsurface solutions that will drive scaled development of next-generation geothermal energy are well on their way,” said Jamie Beard, executive director of Project InnerSpace. “We now need to match that momentum aboveground.”

surface plants than currently exist, according to the prize announcement.

Today, the global market for organic Rankine cycle technology and other equipment that geothermal plants use is concentrated among a small set of manufacturers based in Israel, Turkey, and parts of Europe. Until very recently, those companies had little reason to scale production or revamp designs, owing to the sector's limited growth. Most geothermal equipment is highly customized, and in the U.S., it can take over 18 months to bring it stateside.



As the cost of drilling geothermal wells declines significantly, topside systems are expected to account for up to 50% of total project expenses and much of the risk of delays, Project InnerSpace wrote in a March report.

The turbomachinery supply chain will soon “be the bottleneck standing between next-generation geothermal and the gigawatt-scale deployment the world needs,” Beard said.

Supply chain constraints are hardly unique to geothermal. For fossil-gas power plants, the waitlist for new combustion turbines can stretch three to five years – and that was before the war now raging in the Middle East began disrupting global flows of critical materials.

Geothermal suppliers, for their part, aren't sitting on their hands. Turboden, an Italian turbine-maker owned by Mitsubishi Heavy Industries, said it is preparing to boost production capacity in Italy and make more parts through its U.S.-based subsidiary to

recovery. Last fall, Turboden America was picked to supply equipment for three Organic Rankine cycle units at Fervo Energy's flagship Cape Station project in Beaver County, Utah.

“The volume of this business is growing significantly,” Paolo Bertuzzi, CEO of Turboden, said of geothermal.

The U.S. pipeline of pilot-scale and commercial projects is expanding in Western states like Colorado, Nevada, Utah, and Oregon. The sector is seeing a surge of support from private investors and government agencies that view geothermal as a timely and carbon-free way of meeting the nation’s soaring electricity demand.

Most recently, Fervo said it closed \$421 million in new debt financing last week for the first phase of its 500-megawatt Utah project. The startup’s enhanced geothermal system uses fracking and horizontal drilling to create artificial reservoirs that circulate water and generate steam. Experts said the deal, led by major global banks, is a vote of confidence in the potential for enhanced systems to generate utility-scale returns.

As funders pile on, the Trump administration has protected key tax credits and accelerated permitting timelines for geothermal testing and exploration activities – in stark contrast to its efforts to block new wind and solar projects. In Congress, a bipartisan bill introduced last week would allow the Department of Energy to offer “innovative financing approaches” to advance next-generation geothermal in new states and regions.

Given the favorable conditions, an enhanced geothermal system of up to 500 megawatts in the western U.S. could enter into commercial production within roughly three to four years of active development, down from the timeline of seven to 10 years that’s frequently mentioned for conventional geothermal projects on federal land, according to recent research by the Center for Public Enterprise, a nonprofit think tank.

“That’s an incredible reduction,” said Mitchell Smith, a senior associate at the center, particularly for utilities looking to quickly bring clean power on the grid.

Still, the center’s report assumes that geothermal developers don’t encounter any “serious failure modes” when building their power projects. That can include lengthy interconnection queues as well as big delays in securing power-plant turbines – the very problem the XPrize competition aims to solve.