Geothermal Power Renaissance

By John Benson

November 2026

1. Introduction

Your author subscribes to several periodicals, IEEE Spectrum, Scientific American, and Time Magazine. The last gives me wide ranging news, plus occasionally, something that will become part of a paper regarding the Energy Industry. Most of the article below came from Time and is referenced on page 2 below.

This is about a recent development in geothermal energy, deep-geothermal. The proof-of-concept is a project named Cape Station, and it points to geothermal power's future.

If it achieves its goals, Cape Station will prove that geothermal power can be produced affordably in places once thought unthinkable. "We have a little bit of a burden to bear here;' Sarah Jewett, Fervo[1] chief operating officer, tells me from the cab of the rig.

We have pioneered and proven a new approach to next-generation geothermal, a 24/7 carbon-free energy resource crucial to solving climate change.

Demand for 24/7 carbon-free energy is soaring as its role in addressing climate change becomes more widely recognized.

Power buyers are seeking to bolster reliability, reduce costs, and meet clean energy mandates, corporations are voluntarily establishing 24/7 carbon-free electricity targets, and the federal government is mandating that federal facilities be powered by carbon free power by 2030.

Geothermal is the ideal energy source to meet that demand as well as complement variable generation sources such as solar and wind.

Geothermal is a well-established renewable energy technology that uses hot water to produce electricity.

Cold water is pumped underground, heated up by the Earth's temperature, and brought back to the surface. Modern Rankine Cycle generating technology converts the geothermal energy into electricity in a highly efficient process that emits no carbon or other harmful pollutants. Using this technology, the water is reinjected back into the ground, and no water is lost to evaporation (older geothermal systems and the deep geothermal described herein use conventional water/steam generator prime-movers).

Fervo is leading a wave of ingenuity and technological innovation that is expanding geothermal's potential, vastly increasing geothermal energy production capabilities, and broadening project viability to previously inaccessible areas of the country.

[1] Fervo Energy, https://fervoenergy.com/

2. Fervo Energy

The breeze was crisp and the temperature near freezing as I stood 30 ft. off the ground on the platform of a modified oil rig in this quiet stretch of southwestern Utah on Oct. 15. But two miles deep into the earth below, the drill attached to this giant rig pummeled rock to bring 400°F heat to the surface. Visible from the rig are three new power plants that geothermal energy company Fervo has constructed just a stone's throw away to transform the heat into electricity.[2]

Even with its enormous scale, it would be hard to overstate the importance of this site, known as Cape Station, to the future of geothermal power. If it achieves its goals, Cape Station will prove that geothermal power can be produced affordably in places once thought unthinkable. "We have a little bit of a burden to bear here;' Sarah Jewett, Fervo chief operating officer, tells me from the cab of the rig.

As rig hands maneuver giant oil-and-gas machinery that has been adapted for geothermal, it's hard not to feel as if the future of energy has arrived. Across the horizon in this stretch of the Escalante Desert, countless wind turbines rotate quickly on this blustery day. On a vast empty field, stacks of solar panels dot the landscape at regular cadence, ready to be installed. And, of course, there are the power plants, built by Fervo and designed to run on the heat coming from the geothermal wells. One began operation in September. Two are undergoing tests to start up in the coming months. By 2028, the company says, there will be 11 dotting the landscape, roughly enough to power half a million homes.

Much of the early electricity from this facility will travel west via transmission line to light up homes and businesses in California, but the ability to power homes is not what has taken Fervo's vision from a niche idea to a hot investment. The company launched in 2017 with the goal of repurposing the technology that enabled the fracking boom to generate geothermal power, which uses heat from underground to generate power. With sophisticated drilling, Fervo could drill deeper and horizontally, allowing for geothermal in places it wouldn't have worked before.

The idea came at the right time. At first, Fervo targeted companies looking for clean power, driven by a wave of electrification and climate rules. And now, it's getting a boost from AI's seemingly insatiable hunger for energy. "We think geothermal as an industry can provide hundreds of gigawatts of electricity to the United States;' says Tim Latimer, the company's CEO. "Right now, it's doing like three." The war in Iran and subsequent energy crisis around the world have only made Fervo's technology more compelling-and created a case for expansion in international markets.

Fervo, which completed its initial public offering in May, is a poster child for how the combination of AI-driven electricity demand and energy crisis security concerns have led to a clean-energy tipping point. Around the world, countries and companies are turning to technologies that were developed as climate solutions and now also offer energy security, speed, reliability, and increasingly attractive economics.

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[2] Justin Worland, "Drilling, but not for Oil, Time Magazine, November 23, 2026 Issue, Page 54. To order a back issue of Time, contact customerservice@time.com or call 800-843-8463. This original article has several really good images that are not included in the above, so if a reader is interested in the content of this article, I would suggest ordering this issue.

In March, in the wake of the attack by the U.S. and Israel on Iran, Chinese exports of solar panels soared to record levels, up 49% from the previous record, according to Ember, an energy think tank, and battery electric-vehicle sales rose 45% when you exclude the U.S. and China. In all, the International Energy Agency expects $2.2 trillion in clean-energy investment in 2026 compared with $1.2 trillion for fossil fuels. At the same time, the early-stage companies deploying clean energy tech-from nuclear to battery storage-have seen an uptick in funding as investors increasingly eye opportunities to make a big return by building a new energy system.

"Technology has developed a lot in the last decade, particularly on the electricity side: renewables, storage, EVs, etc.;' says Ernest Moniz, the founder of the Energy Futures Initiative and a former U.S. Secretary of Energy. "The situation is prime for a push on low-carbon energy."

And yet riding the coattails of the data-center build-out and the economic disruption caused by the war in Iran comes with big risks. The scale of the AI boom is enormous, but it could easily be cramped by slowing interest from Wall Street. And volatile politics have proved to be just that, uncertain and subject to sudden shifts. Even so, there's no question that this moment is an inflection point. Old assumptions about the nature of the energy system have been broken-and clean technologies are positioned for success.

The Town of Milford, Utah, is small. There's one hotel, a quiet Travelodge with 75 rooms. The population hovers around 1,400, though the lack of jobs means that young people tend to move away when it's time to find work. When I ask the mayor where I should grab lunch, he struggles a bit. There really just isn't that much around here, he tells me.

So, it came as a surprise to find myself caught in a midmorning traffic jam as I headed into town from the Cape Station site. Road improvements, in progress ahead of Fervo's rapid expansion, along with a slew of trucks carrying equipment, were slowing things down.

Milford, it turns out, is a bit of a boom town. The night before my visit to Fervo, representatives from Google had pitched residents on a new data-center complex co-located with Fervo's operations: two data-center buildings to start, growing to as many as eight. Hundreds of residents showed up, peppering the companies with questions about power and water. "People asked some really, really good questions;' Milford Mayor Nolan Davis told me from his office.

Talking with Latimer, it can sound almost as though Fervo was purpose-built for this moment. Advanced geothermal lacks the intermittency issues that have contributed to wind and solar opposition. And it relies on technology used in the oil and gas industry, which helped it gain quick acceptance telling, the more than $2 billion the company raised will help unlock a dramatic expansion. As drilling costs fall, advanced geothermal will be economically viable in more and more places in the U.S. and around the world. Markets like Japan, where Fervo has made early inroads-are particularly attractive because of the high energy-price environment caused by the Iran war. "We are getting calls all the time:' Latimer says.

Fervo has become in many ways this moment's clean energy golden child, but it's far from alone. Analysis from Dealroom, a company that tracks private-market deals, identified more than $44 billion in climate venture funding raised in the first three quarters of 2026 and projects $59 billion for the full year, up 42% from last year.

3. Major Surge in Energy Companies

The companies receiving sizable checks run the gamut. Energy-storage companies experimenting with new battery chemistries have become hot commodities. Investors have poured money into new ways of producing nuclear energy, from small modular reactors to new engineering architecture for mega-nuclear power plants. Even companies developing nuclear fusion, a technology proven technically possible but far from commercially viable, have received big checks.

Publicly traded companies that manufacture technologies to electrify the economy have seen their stocks surge too. Bloom Energy, a maker of fuel cells, has increased more than ninefold since the start of 2025. Stock in GE Vernova, a legacy maker of electrification equipment, has grown sixfold since it started trading in 2024. These aren't just numbers on a spreadsheet.

For companies making energy hardware, scaling up requires factories, specialized equipment, and years of engineering before products earn a return. Investor enthusiasm makes years of development possible. Buoyed by investors, GE Vernova, for example, has planned $11 billion in investments that includes both R&D and capital investments focused on everything from on-grid hardware to small modular nuclear reactors. Even as gas turbines remain Vernova's biggest business, the company has declined to build new turbine factories.

"The huge benefit for us, and there are many, is they expect innovation;' says GE Vernova CEO Scott Strazik of his hyperscaler customers. "They're ready to make investments on technologies that, I would say, notwithstanding this moment, would have taken longer to materialize."

On the road, across the country and around the world this year, it was hard to escape just how much the energy landscape has shifted. Immediately following the U.S. attack on Iran in February, prices for liquefied natural gas doubled across Asia. In some places, fuel simply hasn't been available at an affordable price since, leading to shuttered factories in cities and a return to burning wood for some poor families. And, while AI is the primary driver of clean-energy investment in the U.S., closing the Strait of Hormuz led to a mad dash for alternative energy sources globally.

In Singapore, three months after the U.S. war in Iran began, I met with government officials and finance leaders from across Southeast Asia. In response to the conflict, countries across the region have enacted dozens of policies designed to shift the tide, from reducing taxes on electric vehicles in Vietnam to pushing local governments to install solar panels in Malaysia. "There's an energy sovereignty and a security issue that can be addressed with the technologies we have, which is more renewables:' says Ravi Menon, Singapore's climate ambassador.

Crucially, this moment has also cast doubt on the age-old approach of throwing money at fossil-fuel subsidies to bring down costs. Sustaining such subsidies is simply unaffordable, and countries across Europe and Asia have sought to modulate or even undo them.

"In difficult moments, where energy goods raise prices, the clear preference is to dedicate public money to address the root causes and to invest in electrification and in efficiency;' says Teresa Ribera, the executive vice president of the European Commission who oversees energy policy in the E.U.

And it's not just government policy. Businesses hit by the volatility are taking the leap too, with decisions big and small. The Mahindra Group accelerated a move to convert kitchens at its resort subsidiary to electric cooking equipment as it faces down high fuel costs. Meanwhile, fuel refiners are looking to biofuels as a potential solution. "Any time the price spikes, that puts more pressure on finding a domestic energy solution," says Paul Bloom, the CEO of Gevo, a renewable-biofuels company. In September, his company signed a deal with an Indian firm to commercialize Gevo's process for turning plant-based feedstocks into a diesel alternative in that country.

The easiest way to understand the rapid change now under way across the globe is simply the speed and scale of solar-power and electric-vehicle deployments. Solar panels are arriving across Africa by the boatload, and countries on the continent are forecast to install a record 17 gigawatts of solar capacity this year, according to Ember. That's a 45% increase compared with last year, and represents about 100,000 solar panels installed every single day. Meanwhile, in India, Brazil, and Vietnam, electric-vehicle sales doubled compared with the previous year in the three months following the start of the conflict in Iran, according to the IEA.

4. Other Clean-Energy Drivers

Catching up on the news after my three-hour drive from Milford back to Salt Lake City, it was hard not to fixate on the headlines focused on the battering of AI-infrastructure stocks. Markets have grown wary of the hyperscaler plans to build $trillions in new data centers, and AI-related stocks are periodically sent into tailspins as a result. For better or worse, clean-energy stocks are now a part of that basket.

In most conversations today, talk of an AI bubble draws comparison to the dotcom boom in the early 2000s that led to a wave of bankruptcies that thinned out the ranks of early internet-companies. But mention a bubble in clean tech and another period comes to mind: the wave of bankruptcies that followed exuberant investment in climate technologies in the late 2000s and early 2010s. From 2006 to 2011, venture capital firms invested more than $25 billion into clean-energy startups, according to an analysis from MIT. More than half of that money was lost as tech breakthroughs failed to yield commercial products.

There is no question that hitching clean energy to AI today comes with risks. If and when the AI bubble pops, there will be collateral damage. Energy tech focused solely on data centers (think of components that live within the centers' walls) may be hardest hit, but the most speculative energy technologies without clear commercialization pathways may also be difficult to justify financially.

Despite all that, it's fair to say that while the AI boom may have given clean tech a lifeline, the fate of the sector doesn't depend solely on AI. Around the world, electricity demand is spiking for a variety of reasons, from economic growth in developing countries to the need for air-conditioning in areas experiencing more extreme heat. And, even as it has largely fallen off the list of priorities in Washington, the emissions that cause climate change remain a concern in most parts of the world.

Perhaps most importantly, the attack on Iran and the subsequent on-and-off-again closure of the Strait of Hormuz have made clean energy, produced locally, more valued than ever before. Back in Utah, the appeal is easy to understand. Fervo's power plants don't depend on shipments of fuel from halfway around the world. "There's just a lot about what's going on globally right now:' says Latimer, "that's driving demand for what geothermal can provide-an energy resource where the fuel is right beneath the power plant."

Clean energy helps lock in costs, avoiding volatile markets. Another country can't simply decide to cut off the supply, as with fossil fuels moved around the world by ship and pipeline. Even if the U.S. and Iran declared an end to the conflict tomorrow, leaders across businesses and governments expect volatility to remain. Clean energy will keep the lights on.

Final author's comment: Clean energy is frequently locally generated. Where I live (mainly in the Livermore Valley in the SF Bay Area) is a prime example of this. On the eastern foothills of my home-Livermore-Valley around the Altamont Pass there are row after row of wind-turbines. Drive across the Central Valley, and start up into the Sierra Nevada Mountains, and you encounter several hydroelectric-generation and water-storage reservoirs owned by Hetch Hetchy Water and Power (San Francisco Public Utilities Commission's (SFPUC) Hetch Hetchy Regional Water System and its 100% greenhouse-gas-free hydroelectric power system).

A few decades ago, I worked on the control system for the above-described Hetch Hetchy facilities when I was employed by Landis & Gyr Systems in San Jose. Hetch Hetchy has since expanded this control system to manage several other hydroelectric systems they owned in the Sierras, including one I drive by on my way from my primary residence (Livermore) to my mountain home (Arnold, CA at 4,000' altitude), Utica Ditch, outlet from Hunter Reservoir.

I believe most of the power generated by the Hetch Hetchy Hydros ends up in PG&E's transmission system, and PG&E is the electric utility for both of my homes.