

With new **geothermal** project, it's full steam ahead for 24/7 carbon-free energy

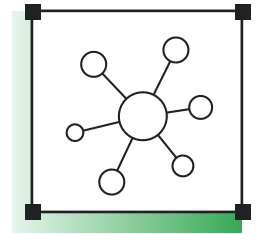
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Director of Energy

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When Google announced our plan to go beyond purchasing renewable power for 100% of our energy usage and operate on 24/7 carbon-free energy by 2030, we noted that achieving this goal will require new transaction structures, advancements in clean energy policy, and innovative new technologies. Today, we're pleased to announce that one of these new technologies—a first-of-its-kind, next-generation geothermal project—will soon begin adding carbon-free energy to the electric grid that serves our data centers and infrastructure throughout Nevada, including our Cloud region in Las Vegas.

Google and clean-energy startup Fervo have just signed the world's first corporate agreement to develop a next-generation geothermal power project, which will provide an “always-on” carbon-free resource that can reduce our hourly reliance on fossil fuels. In 2022, Fervo will begin adding “firm” geothermal energy to the state's electric grid system, where Google's commitments already include one of the world's largest corporate solar-plus-storage power purchase agreements.

Importantly, this collaboration also sets the stage for next-generation geothermal to play a role as a firm and flexible carbon-free energy source that can increasingly replace carbon-emitting fossil fuels—especially when aided by policies that expand and improve electricity markets; incentivize deployment of innovative technologies; and increase investments in clean energy research, development, and demonstration (RD&D).



Next-generation geothermal technology

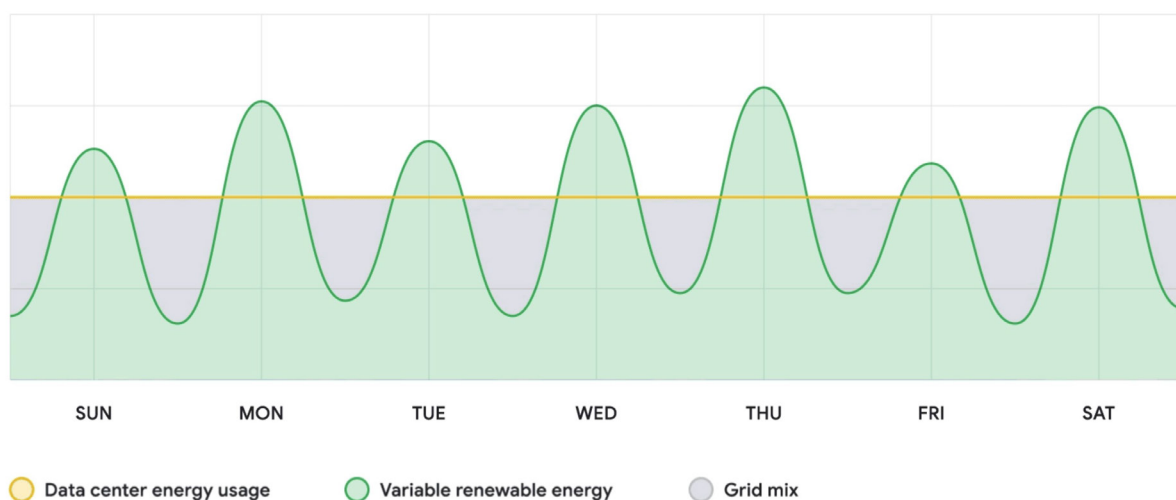
Traditional geothermal already provides carbon-free baseload energy to a number of power grids. But because of cost and location constraints, it accounts for a very small percentage of global clean energy production.

That's one reason this new approach is so exciting; by using advanced drilling, fiber-optic sensing, and analytics techniques, next-generation geothermal can unlock an entirely new class of resource. And the US Department of Energy has found that with advancements in policy, technology, and procurement, geothermal energy could provide up to 120 GW of firm, flexible generation capacity in the US by 2050.

As part of our agreement, Google is partnering with Fervo to develop AI and machine learning that could boost the productivity of next-generation geothermal and make it more effective at responding to demand, while also filling in the gaps left by variable renewable energy sources. Although this project is still in the early stages, it shows promise.

One week of renewable energy generation

Gaps in variable renewable energy are filled with carbon-emitting electricity sources.





Using fiber-optic cables inside wells, Fervo can gather real-time data on flow, temperature, and performance of the geothermal resource. This data allows Fervo to identify precisely where the best resources exist, making it possible to control flow at various depths. Coupled with the AI and machine learning development outlined above, these capabilities can increase productivity and unlock flexible geothermal power in a range of new places.

This won't be the first time that Google is applying software solutions to clean energy applications: we've just announced an update to our carbon-intelligent computing program that helps us reduce emissions associated with running applications at Google data centers. And other forms of AI and machine learning are currently being used to increase the value of wind energy.

Already this year, Google has taken significant strides toward sourcing 24/7 carbon-free energy for all our data centers, office campuses, and Cloud regions. On Earth Day, our CEO Sundar Pichai announced that for the first time, five of our global data center sites operated near or at 90% carbon-free energy in 2020.

Not only does this Fervo project bring our data centers in Nevada closer to round-the-clock clean energy, but it also acts as a proof-of-concept to show how firm clean energy sources such as next-generation geothermal could eventually help replace carbon-emitting power sources around the world.

Contact us

