

ENHANCED GEOTHERMAL SYSTEMS

# Heat Everywhere, Power Anywhere

*A short introduction to EGS — and an honest look at the fracking question*

Maxwell Wilmarth



# The Earth is a giant heat battery

*And it never runs down*



## ~9,000°F at the core

Left over from the planet's formation, plus ongoing radioactive decay in the rock.



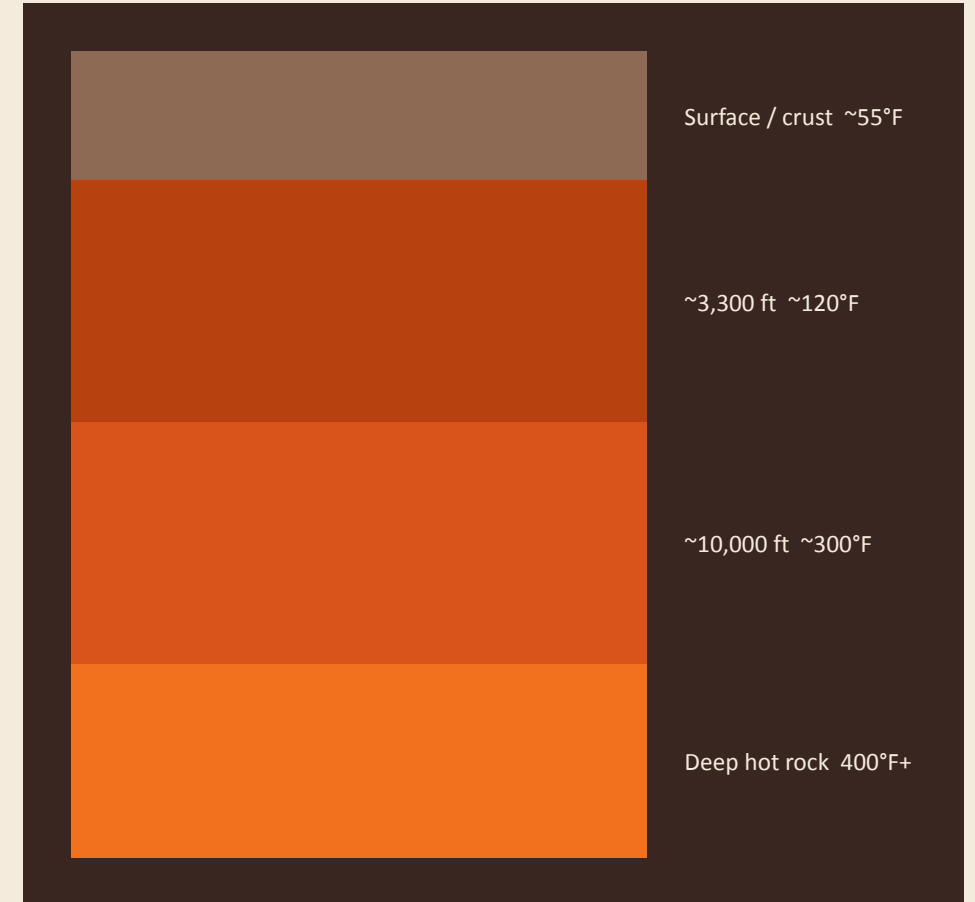
## Gets hotter with depth

Roughly 3-9°F warmer per 100 feet, almost everywhere on Earth, no matter what's on the surface.



## A constant, reliable resource

Unlike sun or wind, this heat is there 24/7 — the challenge is just reaching it.



*Illustrative, not to scale*

# Conventional geothermal needs three things

*Nature only lines all three up in a few special places*



## Heat

Hot rock, close enough to reach by drilling



## Water

Fluid already present underground to carry the heat up



## Permeability

Natural cracks and pores for that water to flow through

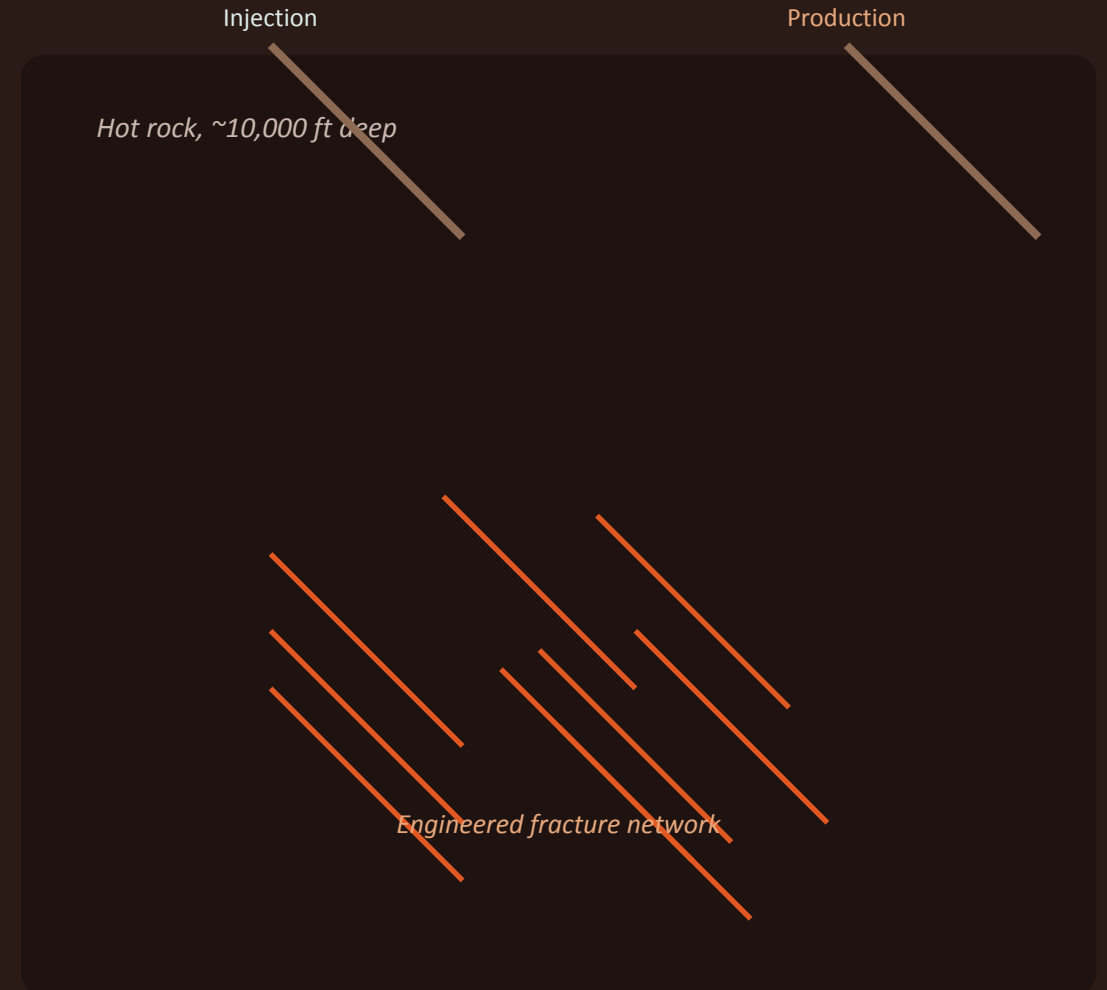
Where all three coexist naturally — Iceland, The Geysers here in Northern California, parts of Nevada — we already generate clean power. Everywhere else, one ingredient is usually missing: permeability.

# Enter EGS: engineering the missing piece

*Enhanced (or Engineered) Geothermal Systems*

Hot rock exists almost everywhere a few miles down. What's usually missing is a path for water to flow through it. EGS creates that path — turning tight, dry rock into a working reservoir.

- 1 Drill wells into hot, low-permeability rock
- 2 Open a network of small fractures to connect them
- 3 Circulate water through the loop to pick up heat
- 4 Bring the hot water up to generate electricity



# Let's talk about “fracking”

*It's a fair question to ask — let's be direct about it*

Yes — creating that fracture network is a form of hydraulic fracturing. EGS operators don't shy away from that word. But the goal, the fluid, and the scale are genuinely different from oil and gas fracking, and geothermal has its own hard-won lessons about doing it responsibly.



## **Different purpose**

Oil & gas fracking releases trapped hydrocarbons. EGS fracturing just opens a path for water to flow and carry heat — nothing is extracted from the rock itself.



## **Different fluid**

EGS circulates mostly water and “propants” (basically just sand), in a loop that's reinjected and reused. Oil & gas fracking uses many more chemical additives, much of which returns to the surface as wastewater.



## **A known risk, taken seriously**

Early EGS projects (Basel 2006, Pohang 2017) caused felt earthquakes and taught the industry hard lessons. Today's projects avoid population centers, use real-time seismic monitoring, and stop-and-adjust protocols to keep activity below the threshold people can feel.

# This isn't hypothetical anymore

*EGS is happening in the U.S. right now*



## Utah FORGE

A DOE research site in Beaver County, Utah, purpose-built to test EGS drilling and stimulation methods — including seismic monitoring protocols — before they go commercial.



## Fervo Energy – Cape Station

Built right next to FORGE. Its first phase is targeted to deliver power to the grid in 2026, scaling toward 500 MW — using horizontal drilling and staged stimulation adapted from oil-field techniques.



## Why it's a big deal

Unlike solar or wind, EGS can supply firm, 24/7 clean power from almost any location deep enough to drill — a genuine complement to intermittent renewables.

# Why this matters for California & beyond



## **Firm, carbon-free power**

A steady baseload partner for solar and wind — available at night and when the wind isn't blowing.



## **Works almost anywhere**

EGS doesn't need a rare natural hot spring — just hot rock deep enough to reach, which greatly widens where geothermal can be built.



## **A resource with growing pains, managed openly**

Like any energy technology, EGS carries real risks. The industry's response — monitoring, protocols, transparency — is worth watching and asking about.

# Questions?

*Let's talk about EGS, fracking, seismicity, or anything else on your mind.*