



Geothermal Energy Machinery and Systems (GEMS) Workshop

2024 Recap

NOVEMBER 2024

In 2024, US geothermal ecosystem experienced significant advancements

Major technology progress

- **Record flow rate in EGS¹ achieved** (10 MWe, 107 Kg/s), close to commercial viability at scale
- **Breakthroughs in drilling execution** thanks to transferring learning from O&G
- **Progress in next-gen technologies** continues with FORGE² and private pilots (e.g., Sage)

Favorable demand outlook

- **Strong demand for clean baseload power** driven by both data centers and utilities
- **Geothermal PPA prices increasing** and already above \$100 MWh (\$100-120 MWh Q4 2024)
- **Flagship geothermal PPAs signed** over 2024 (e.g., 320 MW PPA between Fervo and SCE³)

Bipartisan policy support

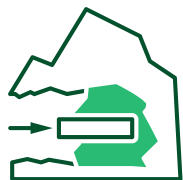
- **Permitting challenges eased**, adoption of categorical exclusions in federal lands
- **Active DOE support** for pilots (e.g., \$60M of funding) and LPO⁴ support
- **Successful acreage auction** in federal lands, with record prices registered

Growing interest across investors, O&G companies and power companies

Improvements in drilling and flow rates have enabled significant cost reductions for Enhanced Geothermal Systems (EGS)

Major improvements in subsurface costs have been published in the last 12 months

Today, EGS is close to be commercially viable at scale



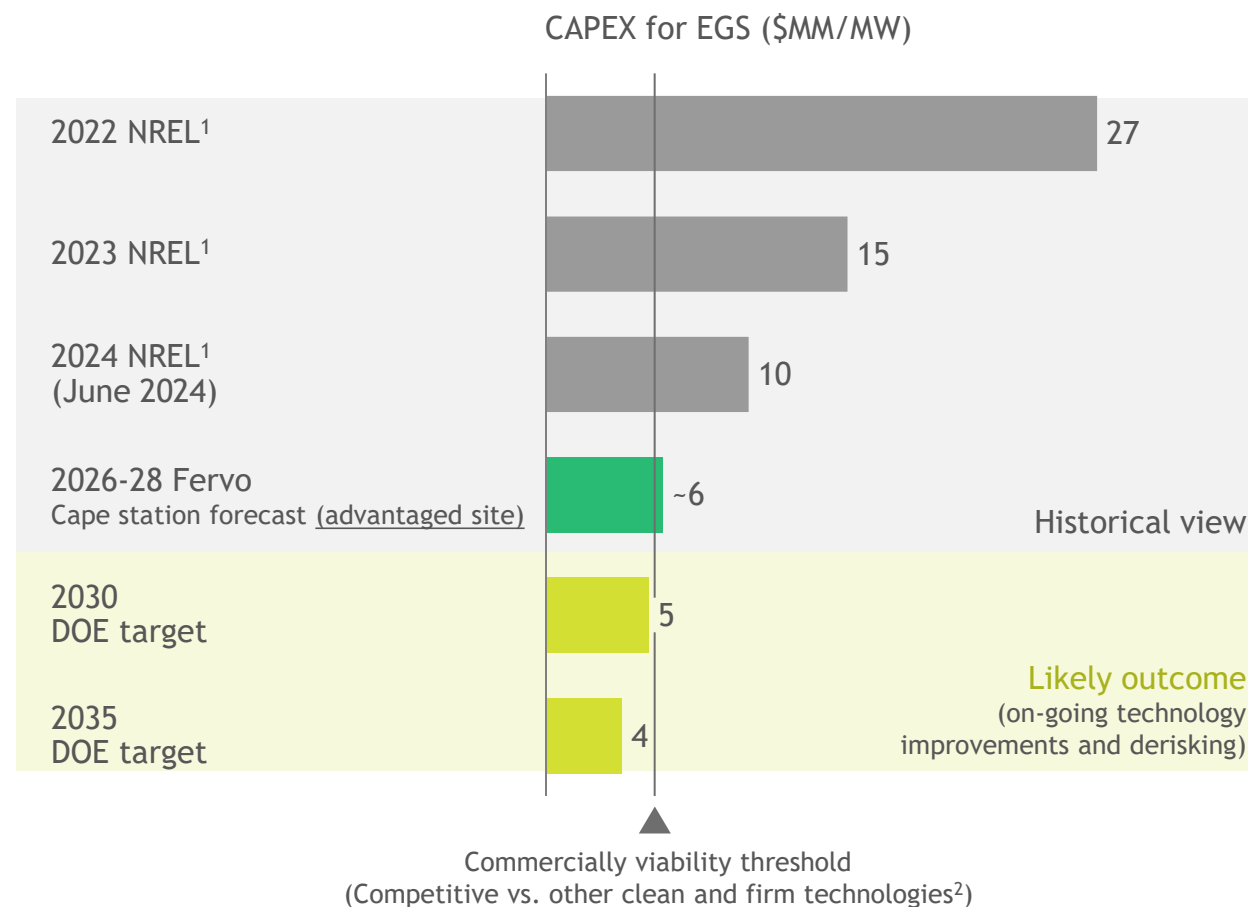
Major subsurface cost improvements achieved by applying O&G practices

Drilling times have improved by 70% since 2022



Record flow rate in Fervo's Cape station

The 30-day test, enabling over 10 MWe of generation, 3x the production of previous commercial pilot, Project Red

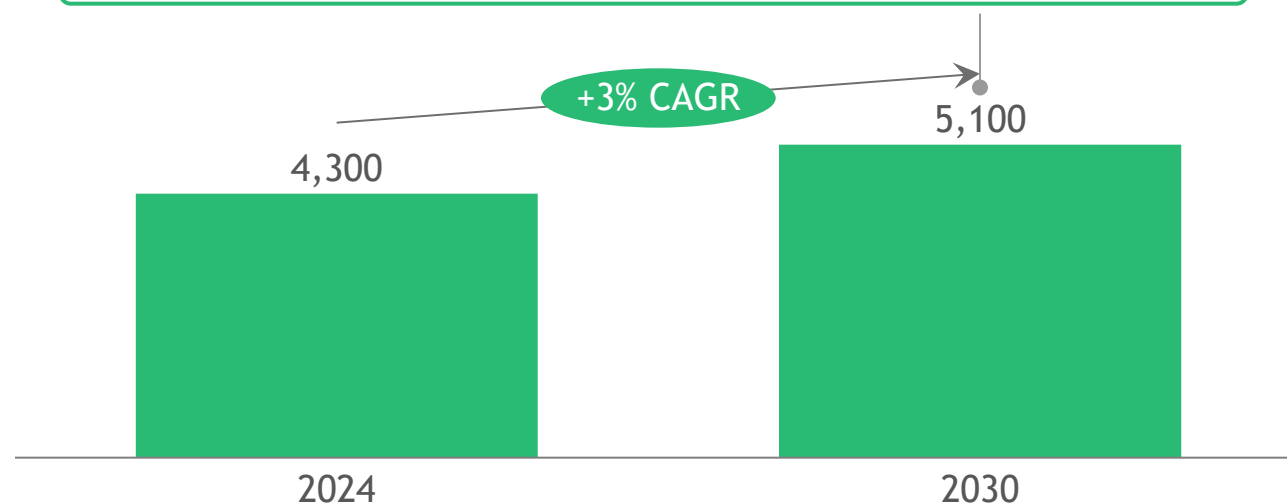


1. First Of A Kind NREL estimate ATB Advanced case 2. CCGT + CCS.
Source: NREL; DOE next generation commercial liftoff report; BCG analysis

Increasing demand for geothermal power driven by both data centers and utilities that place high value on its clean and firm power attributes

Estimated total US projected energy demand (TWh)

60% of demand increase expected to come from data centers.
Geothermal is seen as one of the leading option for clean 24/7 power requirements if resource is available.



Recent geothermal PPAs

Baseload: offtaker utility



FERVO
ENERGY



**SOUTHERN CALIFORNIA
EDISON**
An EDISON INTERNATIONAL Company



**320
MW**

World's largest geothermal PPAs to date

Geopressured Geothermal
Systems: offtaker data center

East of Rocky Mountains



SAGE GEOSYSTEMS

Meta

**150
MW**

First utility scale PPA for Geopressured
Geothermal System

Baseload: offtaker data center demand



FERVO
ENERGY

Google



**115
MW**

Enabled by first of a kind contract structure
with local utility (Clean Transition Tariff)

Growing premium for clean firm power seen in current PPA negotiations (\$100-120 MWh Q4 2024 vs. \$90-100/MWh in Q3 2024)

Policymakers are actively supporting geothermal scale-up with policies that aim to reduce permitting timelines and support technology improvements

New policies enacted to improve permitting and increase demand



Federal actions focused on reducing permitting timelines

- BLM¹ adopts **categorical exclusions** to expedite geothermal energy permitting

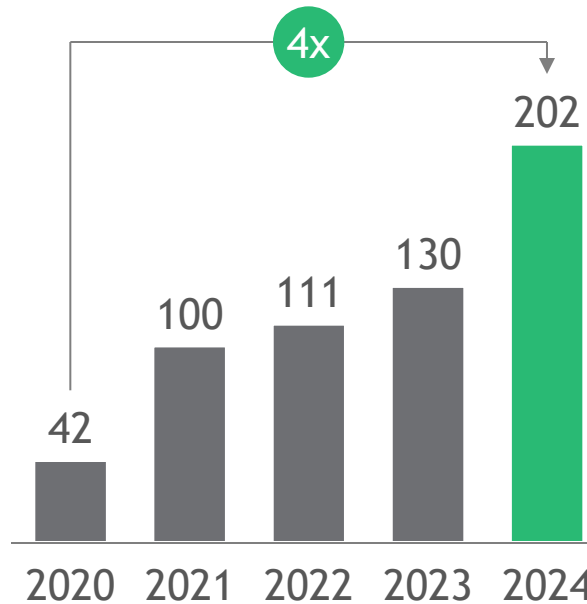


California regulators approved in Aug 2024 a **plan to procure 1 GW of additional geothermal capacity** between 2031 and 2037

Strong interest for federal land acreage continues

NV land auction prices up 55% YoY

Max bid/acre (\$)



DOE actively supporting next-generation of technologies

DOE announced **\$60MM** funding toward 3 EGS pilots

1



"Super-hot" EGS demo site

2



EGS pilot in Cape Station

3



EGS pilot near Geysers



Activating ecosystem to support funding opportunities

Disclaimer

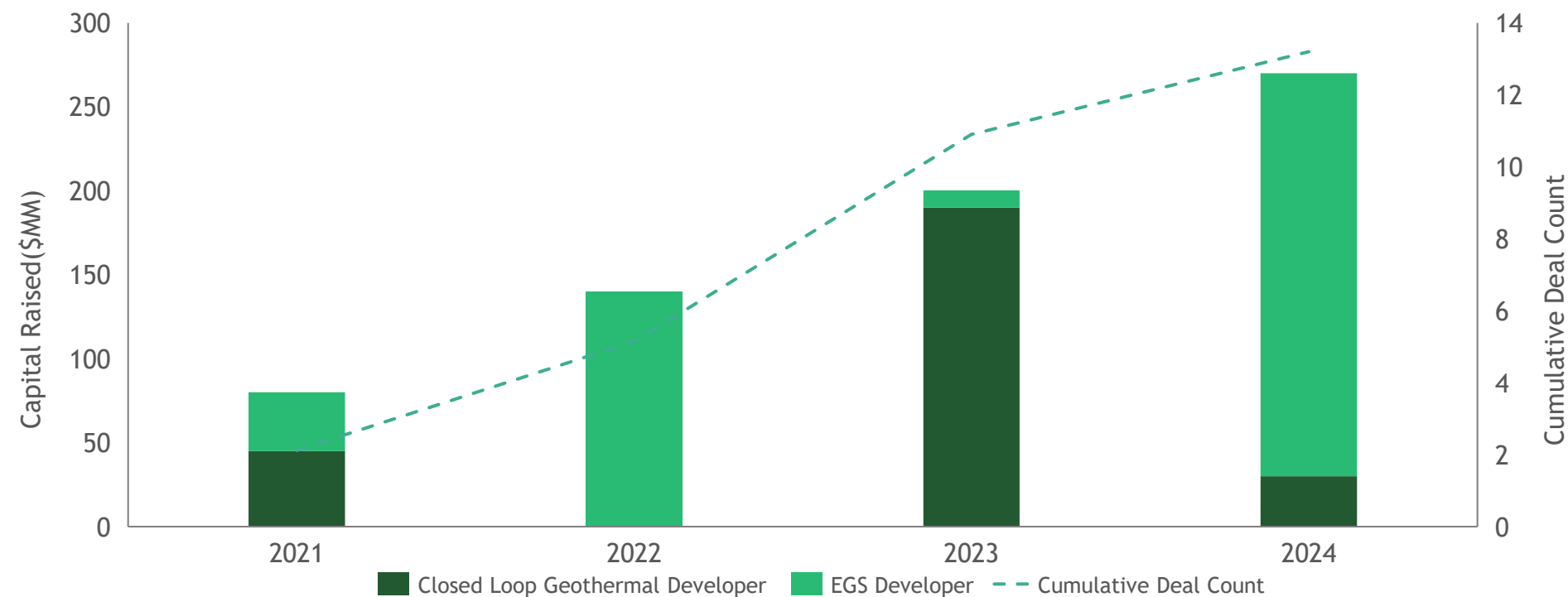
The services and materials provided by Boston Consulting Group (BCG) are subject to BCG's Standard Terms (a copy of which is available upon request) or such other agreement as may have been previously executed by BCG. BCG does not provide legal, accounting, or tax advice. The Client is responsible for obtaining independent advice concerning these matters. This advice may affect the guidance given by BCG. Further, BCG has made no undertaking to update these materials after the date hereof, notwithstanding that such information may become outdated or inaccurate.

The materials contained in this presentation are designed for the sole use by the board of directors or senior management of the Client and solely for the limited purposes described in the presentation. The materials shall not be copied or given to any person or entity other than the Client ("Third Party") without the prior written consent of BCG. These materials serve only as the focus for discussion; they are incomplete without the accompanying oral commentary and may not be relied on as a stand-alone document. Further, Third Parties may not, and it is unreasonable for any Third Party to, rely on these materials for any purpose whatsoever. To the fullest extent permitted by law (and except to the extent otherwise agreed in a signed writing by BCG), BCG shall have no liability whatsoever to any Third Party, and any Third Party hereby waives any rights and claims it may have at any time against BCG with regard to the services, this presentation, or other materials, including the accuracy or completeness thereof. Receipt and review of this document shall be deemed agreement with and consideration for the foregoing.

BCG does not provide fairness opinions or valuations of market transactions, and these materials should not be relied on or construed as such. Further, the financial evaluations, projected market and financial information, and conclusions contained in these materials are based upon standard valuation methodologies, are not definitive forecasts, and are not guaranteed by BCG. BCG has used public and/or confidential data and assumptions provided to BCG by the Client. BCG has not independently verified the data and assumptions used in these analyses. Changes in the underlying data or operating assumptions will clearly impact the analyses and conclusions.

Next generation technologies are experiencing a significant increase in deal activity and capital funding

Capital raised and cumulative deal count in next-generation geothermal, 2021-2024



Source: SightLine Climate Geothermal market overview



bcg.com