Alaska State Senate Resources Committee

Alaska's Multi-GW Opportunity

Sage Geosystems

February 26, 2025

Experienced Team of Industry Leaders

Cindy Taff ***Founder & Chief Executive Officer***

Previously global VP of Unconventional Wells at Shell.

Dr. Lev Ring ***Founder & President***

Previously Director of Technology Development at Weatherford and Technology Development Manager at Enventure (a joint venture between Shell and Halliburton).

Lance Cook ***Founder & Chief Technology Officer***

Previously Chief Scientist and global VP Technology for Wells at Shell.

Doug Simpkins

Modeling Director

Weatherford

Jason Peart

GM Strategy & Development

Shannon Bolton

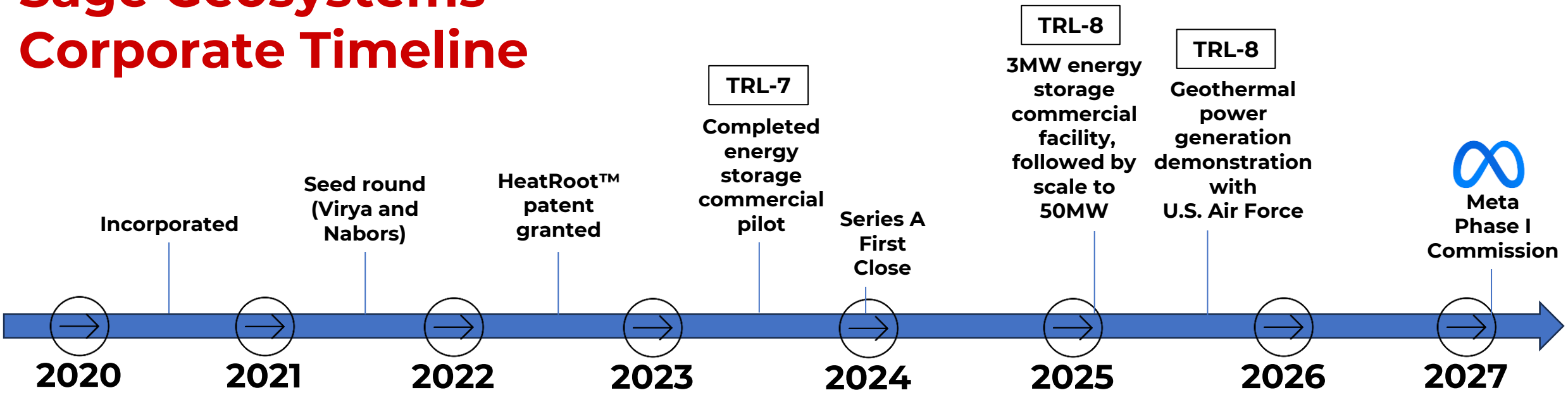
Project Manager

Mike Eros

Chief Geoscientist

ExxonMobil

Sage Geosystems Corporate Timeline



In less than 4 years, Sage has:

- Reached TRL-7
- One cornerstone patent granted (gravity fracturing methodology)
- One cornerstone patent with all claims allowed (using the earth's pressure energy)
- Designed, built, and load-tested a full-scale 3MW sCO2 turbine in partnership with SwRI

Over the next year, Sage will:

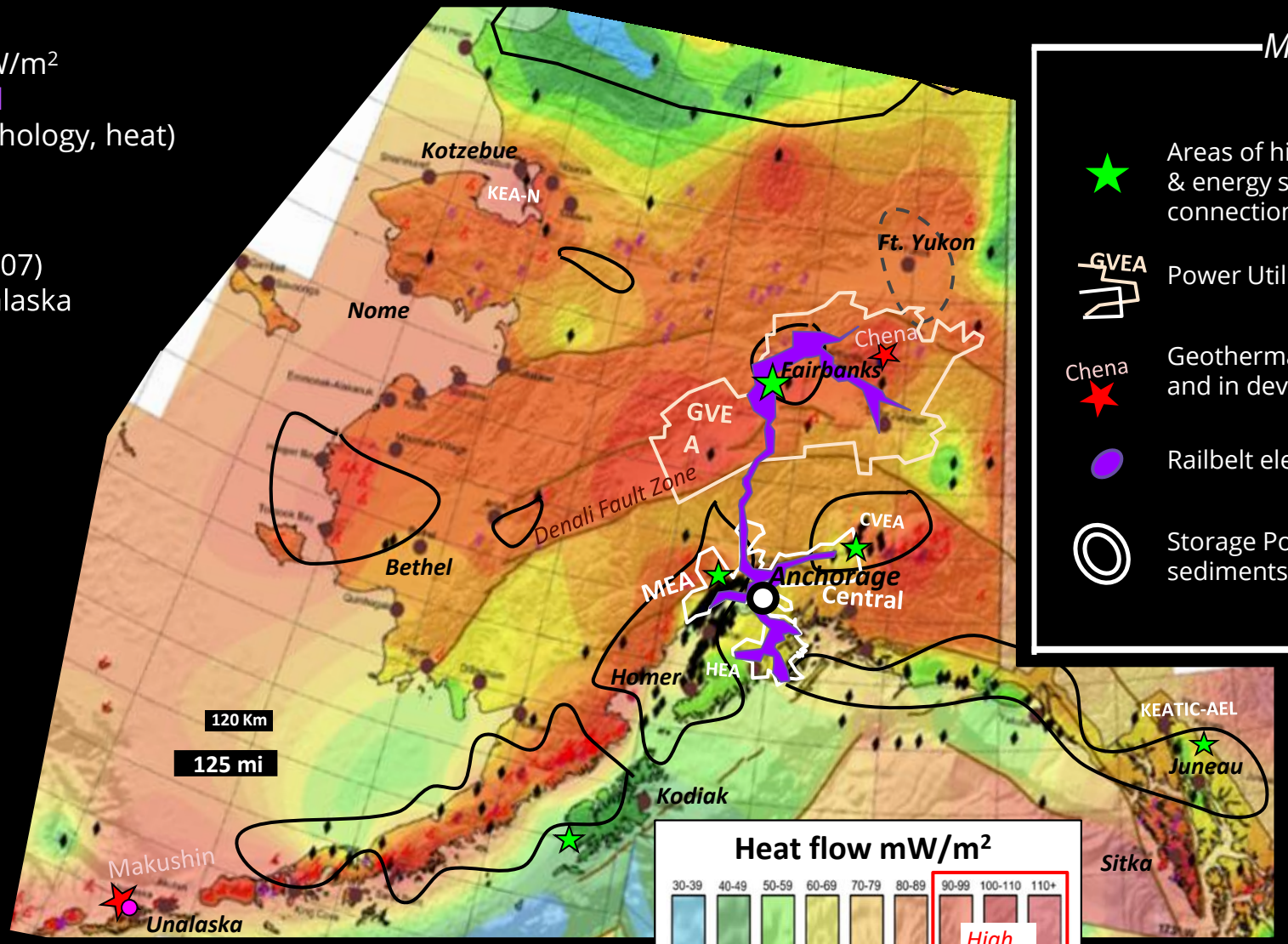
- Commission its first EarthStore™ 3MW commercial energy storage facility
- Buy/sell electricity to the ERCOT grid to enable moving from equity to project financing
- Demonstrate its geothermal technology and generate electricity in a joint effort with the U.S. Air Force

Alaska's Abundant Geothermal and Subsurface Energy Storage Potential

High Potential:
- Subsurface heat >90 mW/m^2
- Proximity to Railbelt grid
- De-risked subsurface (lithology, heat)

Geothermal Developments:
- <500kW Chena Plant (2007)
- ~15 MW Makushin / Unalaska Plant (planned)

SAGE GEOSYSTEMS



Batir et al. (2016)

MAP LEGEND

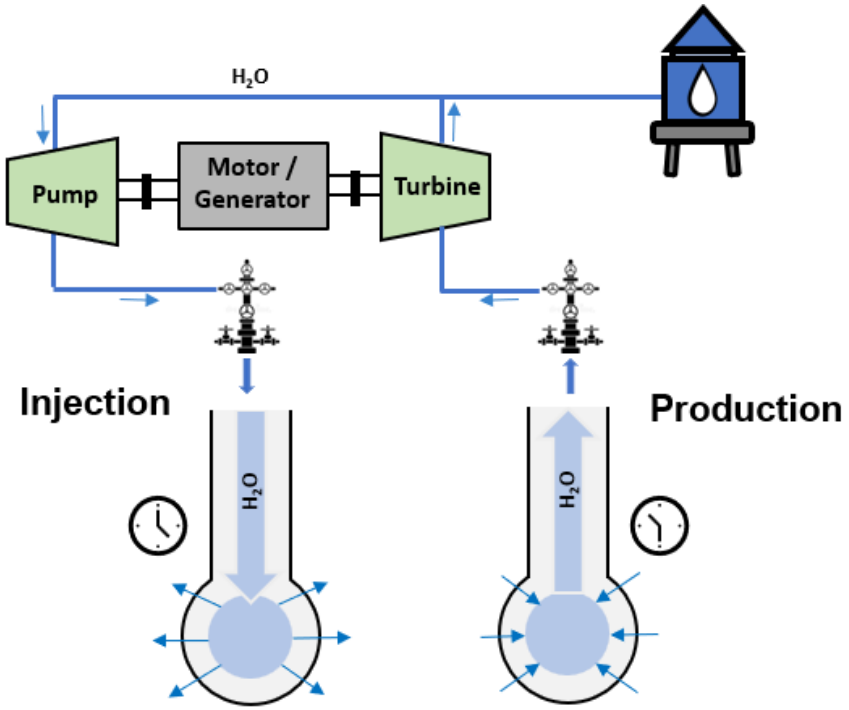
- Areas of high potential for geothermal & energy storage, utility grid connection, population
- GVEA — Power Utility Companies
- Chena — Geothermal Power Plants (existing and in development)
- Railbelt electrical grid (2012; EPA)
- Storage Potential: Sealing basin sediments > 4 km thick (Berg et al. 2020)

Map Symbols
- Heat Flow Data
- Select Cities
- Hot Springs >40 °C
- Hot Springs <40 °C
- Volcanoes
- Fault Lines
- Geo. Power Plants

New Subsurface Energy Solutions: Two Products Built on Same Technology

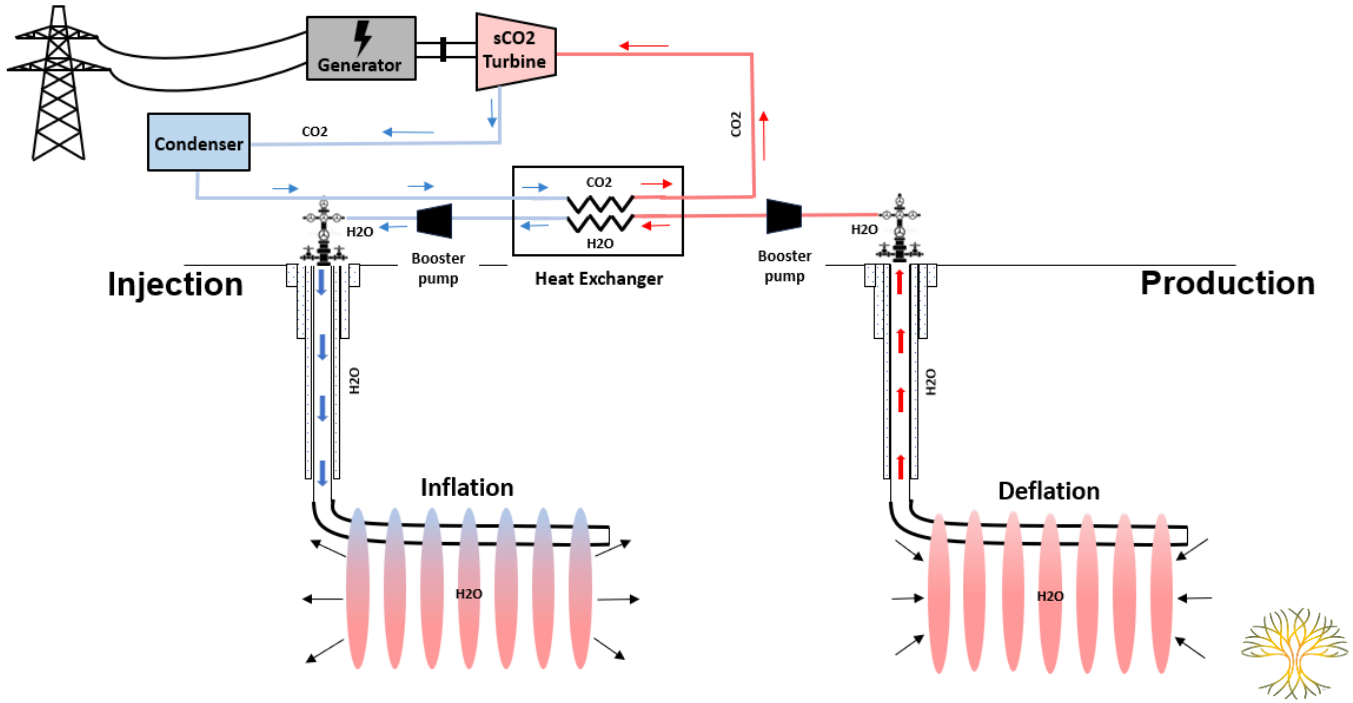
Energy storage (EarthStore™)

- **Uses only pressure (mechanical) energy**
- **70-75% round-trip efficiency (RTE)**:
- **< 2% water losses and 3MW-5MW per well**
- Can be designed for **short-duration** (3-4 hours) **or long-duration** (24+ hours)
- **Demonstrated in Texas** (2022-2025)



Geothermal (Geothermal Geopressured System)

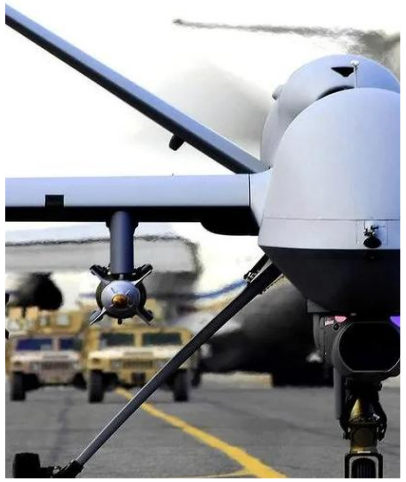
- **Uses pressure <u>and</u> heat energy**
- **80% of the tech is the same** (using pressure energy), with the remaining 20% being a **heat exchanger** and **binary cycle turbine**
- Sage's GGS geothermal technology will be demonstrated in 2025 with the **U.S. Air Force**

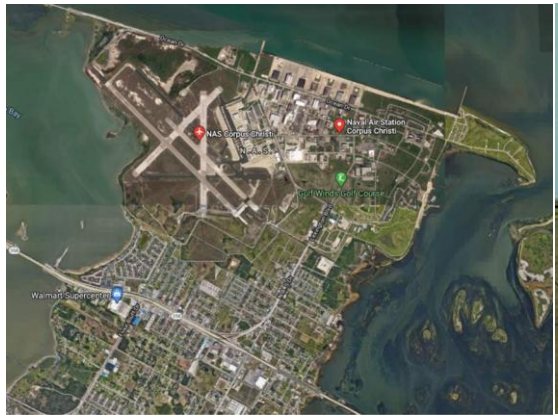


U.S. Department of Defense Projects

Feasibility Study for U.S. Army & DIU at Fort Bliss
|Ongoing|

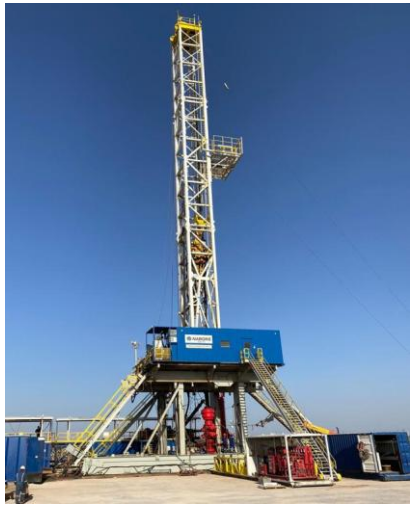
Commercial 3-5MW Installation for U.S. Air Force
at Ellington Field in Houston, TX
|PPA to follow geothermal demonstration in Starr County|





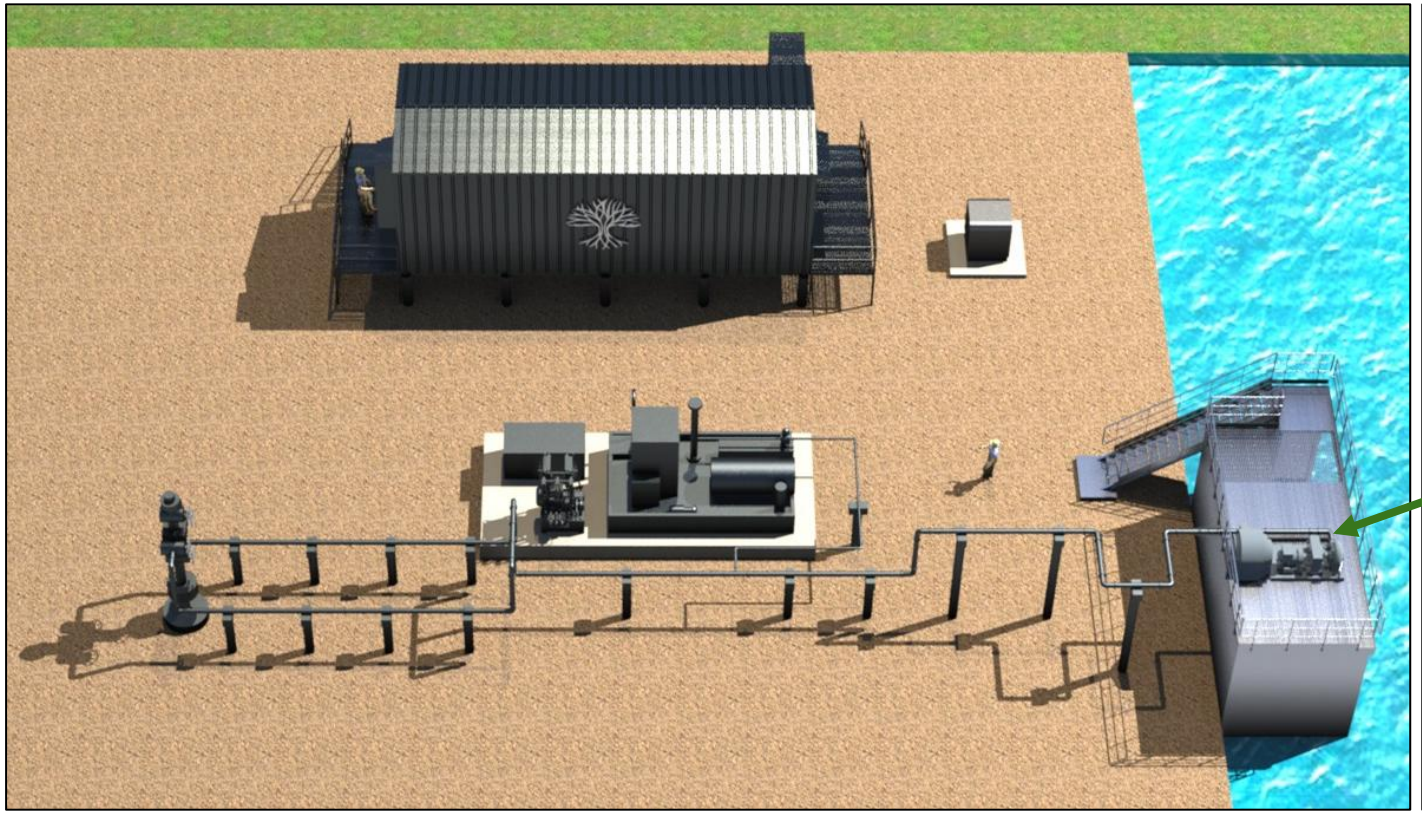
Feasibility Study for U.S. Navy & DIU at Naval Air Station CC
|Ongoing|

Geothermal Demonstration for U.S. Air Force in Starr County, TX
|Funded - Targeted for 2025|



First Commercial 3MW Subsurface Storage Facility (2025)

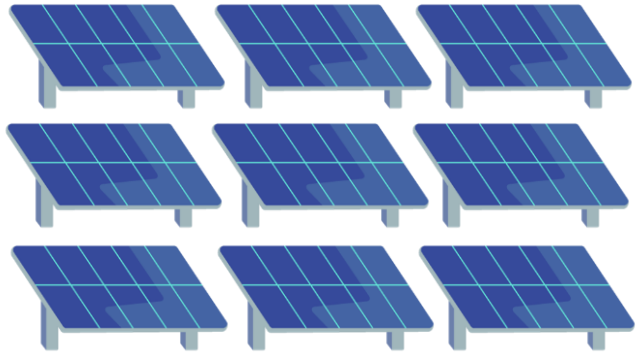
COD in January 2025 in partnership with San Miguel Electric Cooperative Inc. (SMECI)



3MW Pelton turbine / generator

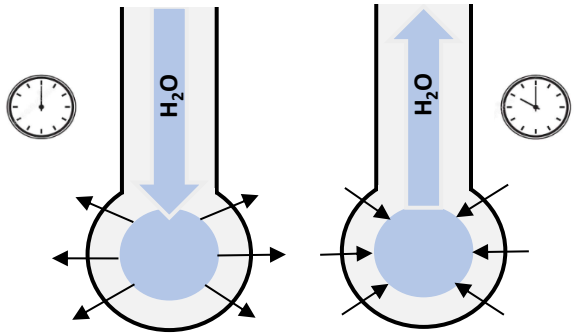
Use Case: Solar + Storage = Scalable 24/7 Power

Solar

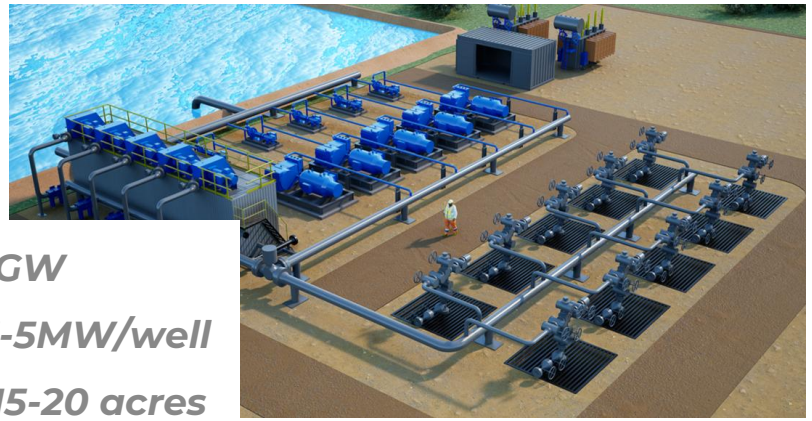


- ***Solar = 200MW*** *to sell directly to off taker*
- ***Overbuild (2.7x) = 540MW*** *to pump and store water in well*

Energy Storage

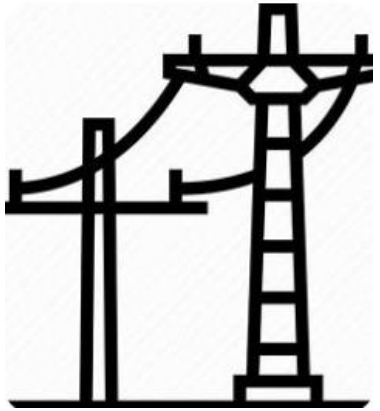


- ***Energy storage = 200MW*** *to sell when the sun is down*



- ***Scalable to GW***
- ***10 wells at 3-5MW/well***
- ***Footprint = 15-20 acres***

24/7 Power



200MW *to sell* ***24/7***

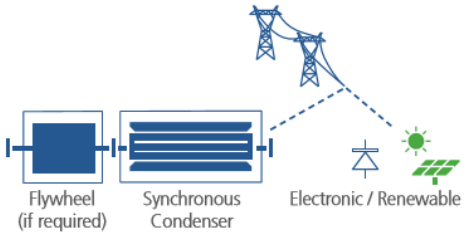
Energy Storage + Solar: Coal Power Plant Repurposing

Texas Example:

San Miguel Electric Cooperative Inc. (SMECI) With Sage Geosystems: Lignite Coal Plant Staged Plan

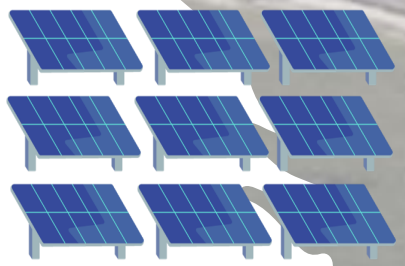
- **Convert 410MW coal plant to clean, renewable power**
- **1GW by 2030 = solar with storage + geothermal power**
- **Repurpose 400 SMECI jobs**
- **Fill economic void left from coal plant closure**

Synchronous generator

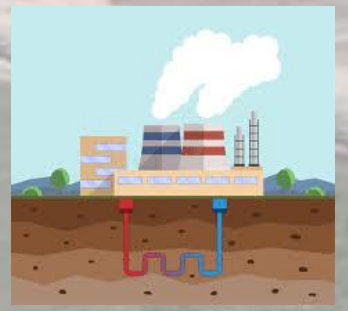


Batteries

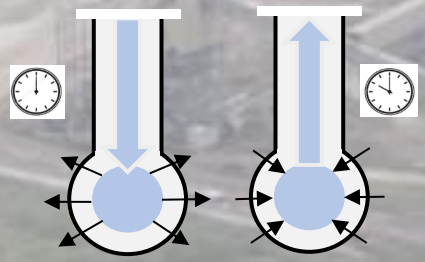
Solar



Geothermal



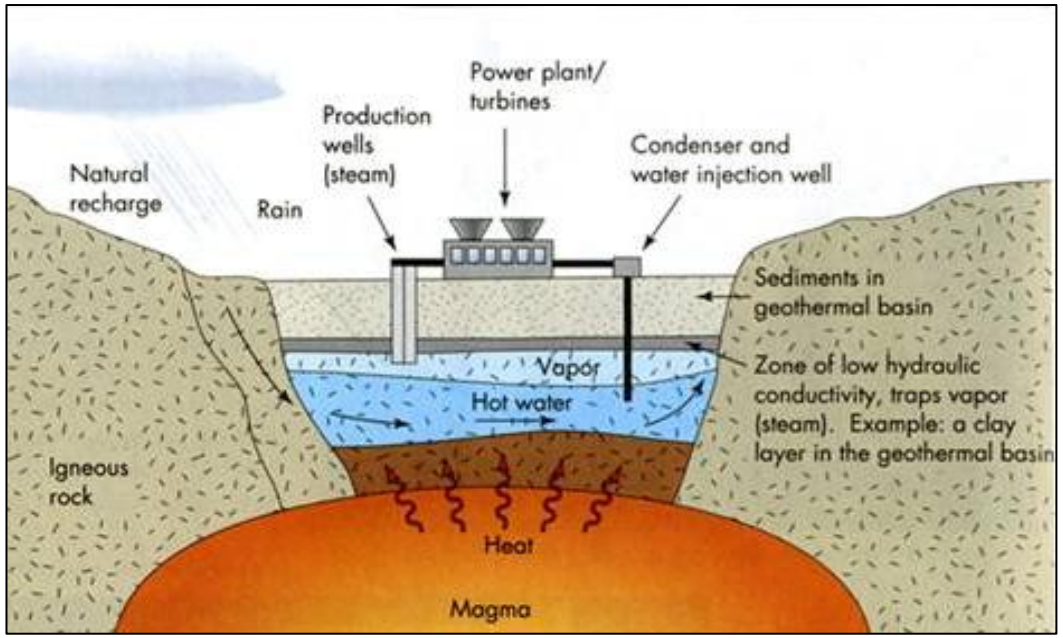
Storage



Geothermal is < 1% of Utility Power

Current: Conventional Geothermal

- Permeable rocks naturally flowing steam/water
- Geographically limited to areas near volcanoes
- Production rates often unpredictable

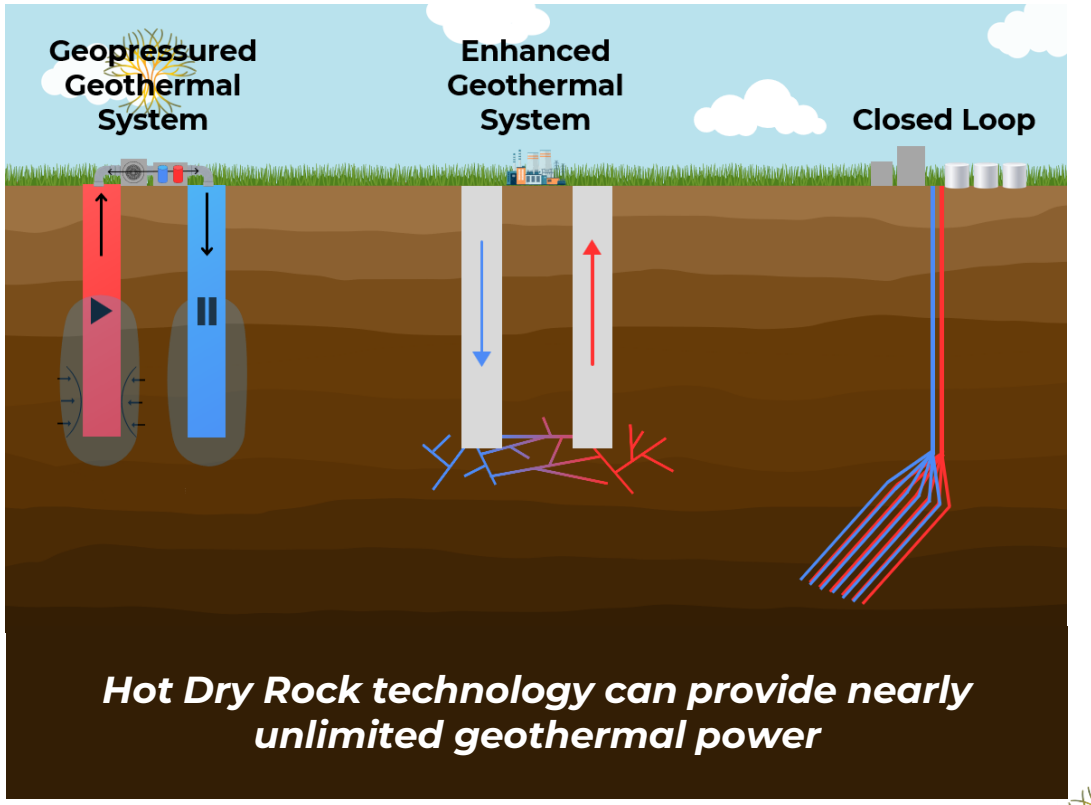


< 2%

of geothermal resources

Future: Hot Dry Rock

- Rocks that do not naturally flow steam or water
- Drilling for temperature not water production



Hot Dry Rock technology can provide nearly unlimited geothermal power

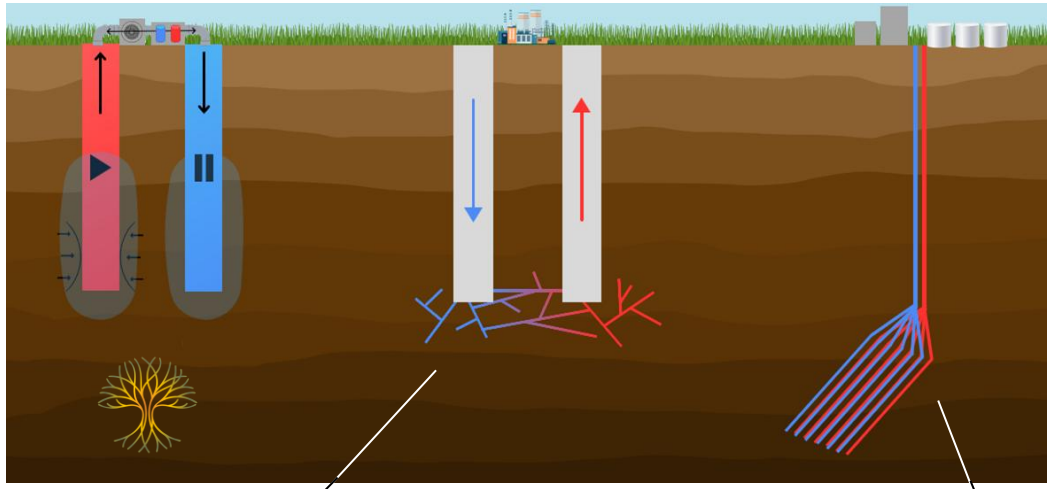
Hot Dry Rock Geothermal

Competitive edge

Geopressured Geothermal System
(e.g., Sage)

Enhanced Geothermal System
(e.g., DOE/Fervo)

Closed Loop System
(e.g., Eavor)



+ Conventional tech developed by the U.S. DOE
- Lower net power output due to high friction in fractures
- Added complexities of connecting multiple wells with fractures

+ Does not require fracturing
- Complex directional drilling = high Capex
- Requires tens of kms of well length for sufficient surface area = high Capex

Sage has figured out how to make hot dry rock geothermal commercially viable:

- **Net power output is significantly higher (25-65%), as uses pressure and heat energy**
- **Less Capex**
- **Even fluid dispersion and lower friction pressure in fracture:** Only company to operate above frac opening pressure
- **Proprietary Geopressured Geothermal System (GGS) design**
- **Lower risk of induced seismicity**
- Enabling **commercial geothermal 'anywhere'**

Use Case: 150MW Term Sheet with Meta Platforms

- Sage Geosystems & Meta terms:
  - Phase I = 8MW | COD 2027
  - Phase II = 150MW | COD 2030
  - Option for additional 200MW
- Location TBD *(L48 east of the Rocky Mountains)*
- Term sheet signed with VPPA to follow

Thank you to our investors and partners!

Happy to take questions.

For more information:
https://www.sagegeosystems.com/

Danny Hillis

Meta

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