Oil and Gas to Superhot: Exploring the Opportunities

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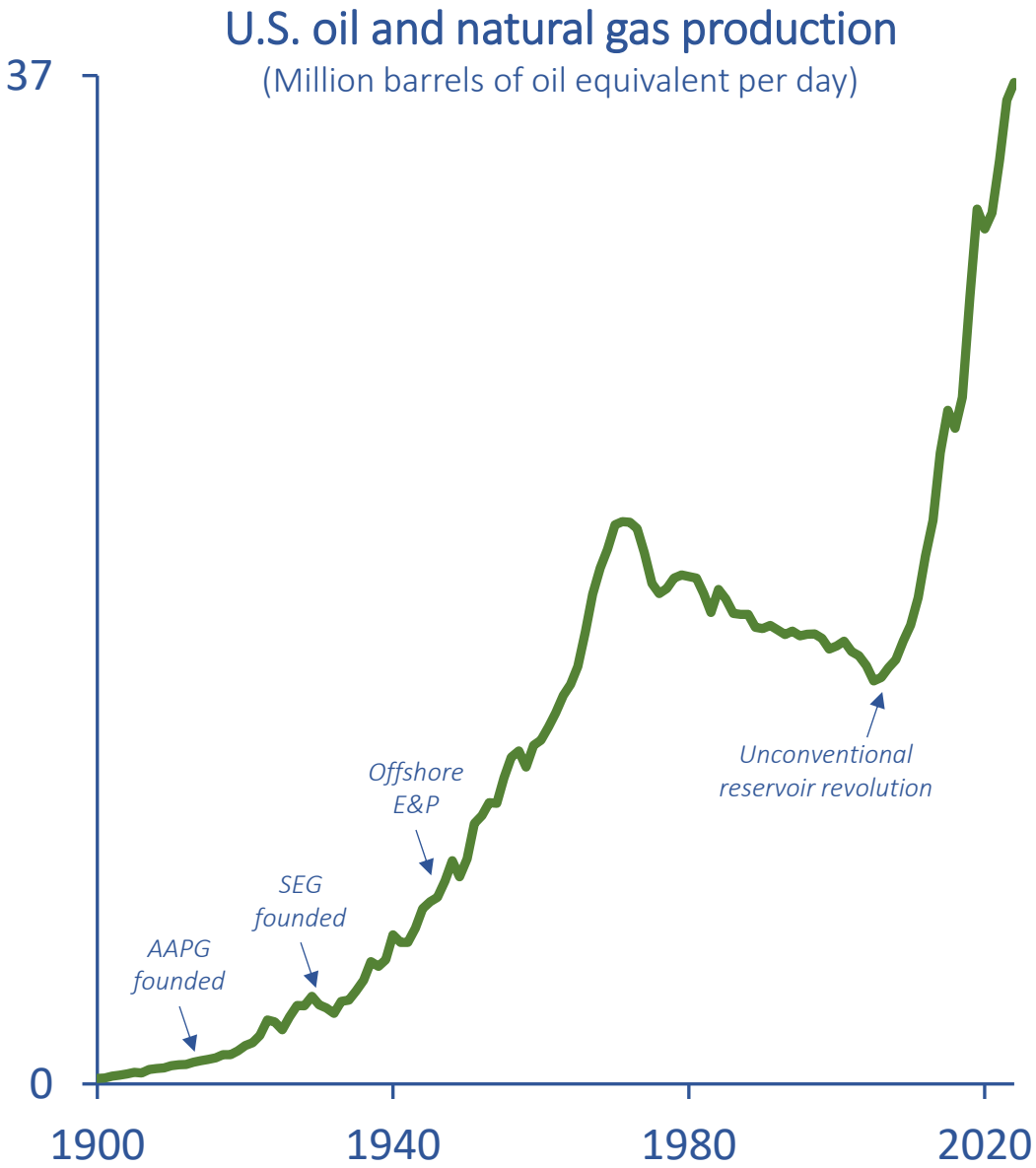
The O&G industry has a history of delivering transformational innovations

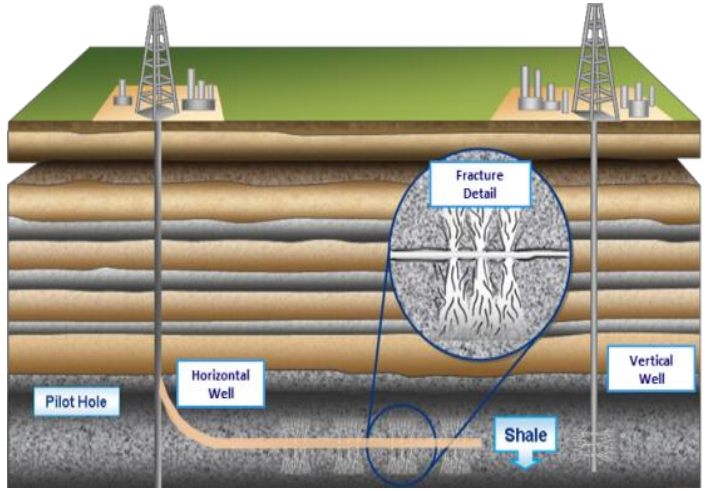


Sources: U.S. EIA and Energy Institute websites

1917: Founding of AAPG

1930: Founding of SEG

Post WWII: Offshore E&P



Early 2000s: Unconventionals

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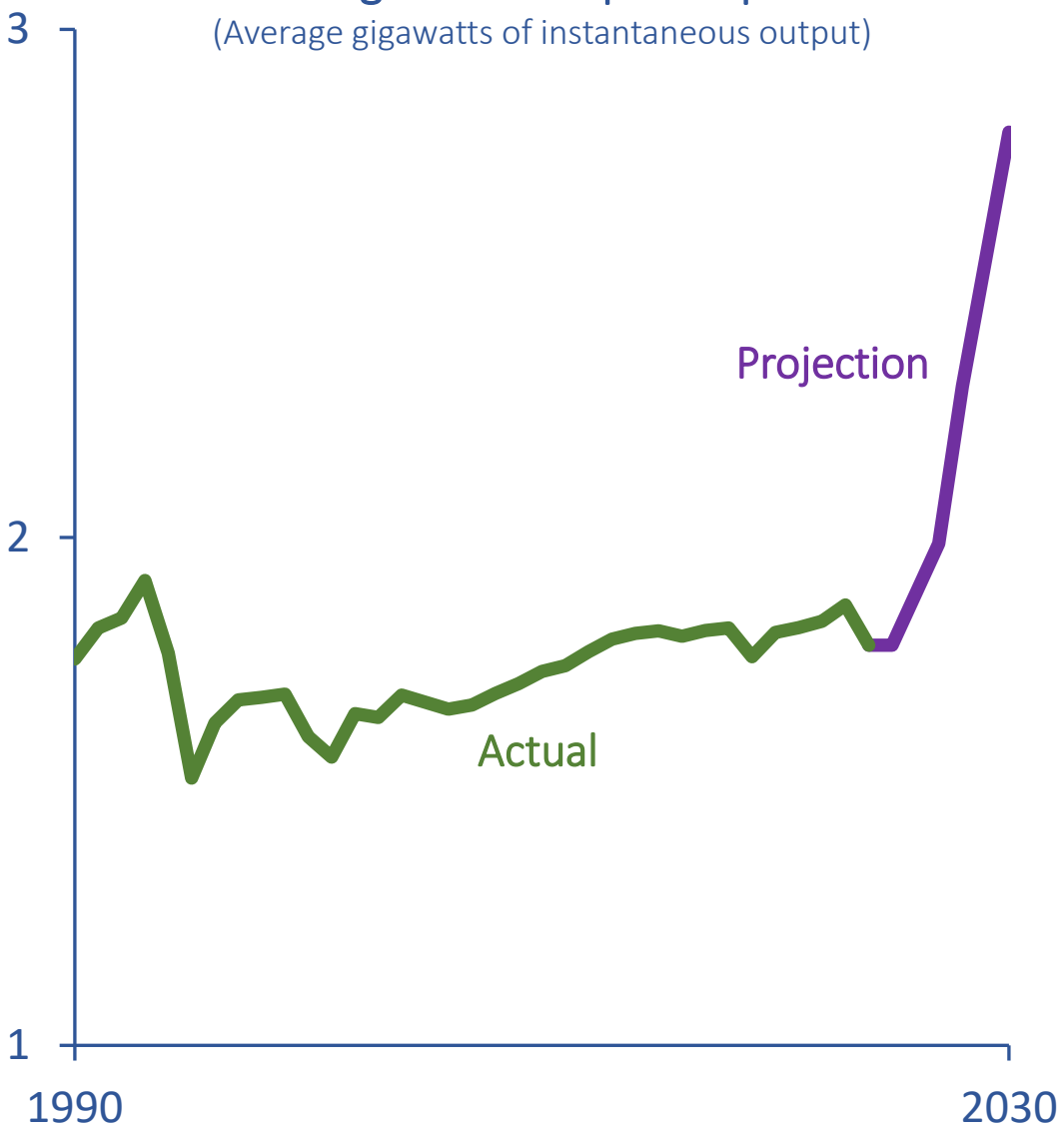
Today, transformational change is underway in the geothermal power industry

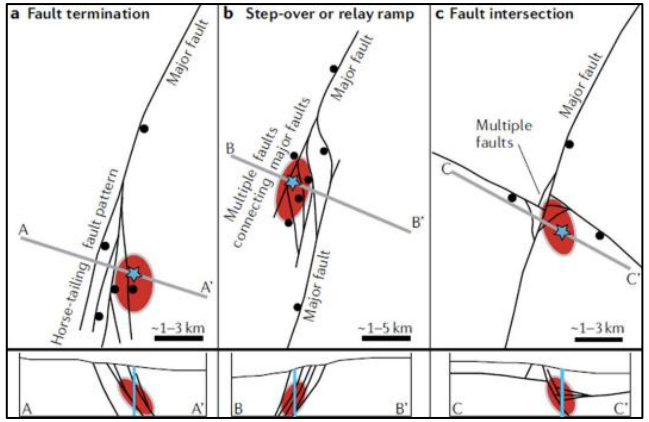
U.S. annual geothermal power production

(Average gigawatts of instantaneous output)



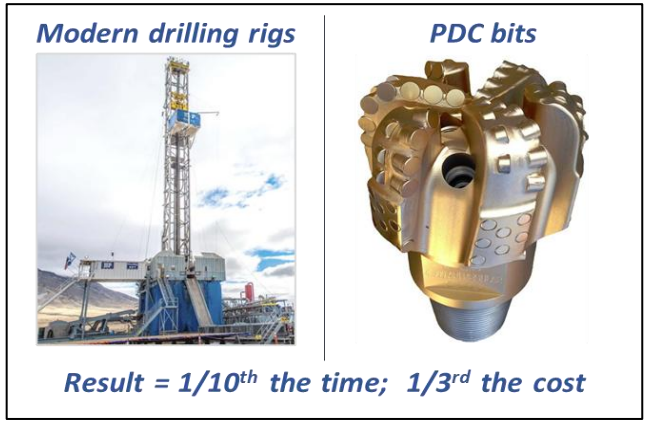
Source: U.S. EIA website

Exploration

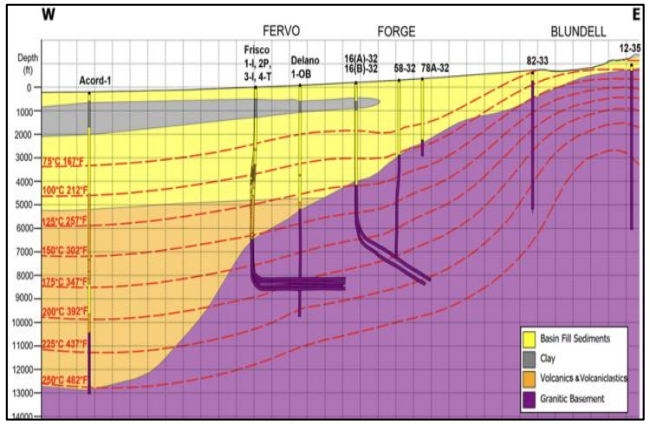


Source: Jolie et al., 2021

Drilling Efficiency



Horizontal wells



Source: Norbeck et al, 2024

Rapid Demand Growth

Source: Fervo Energy website

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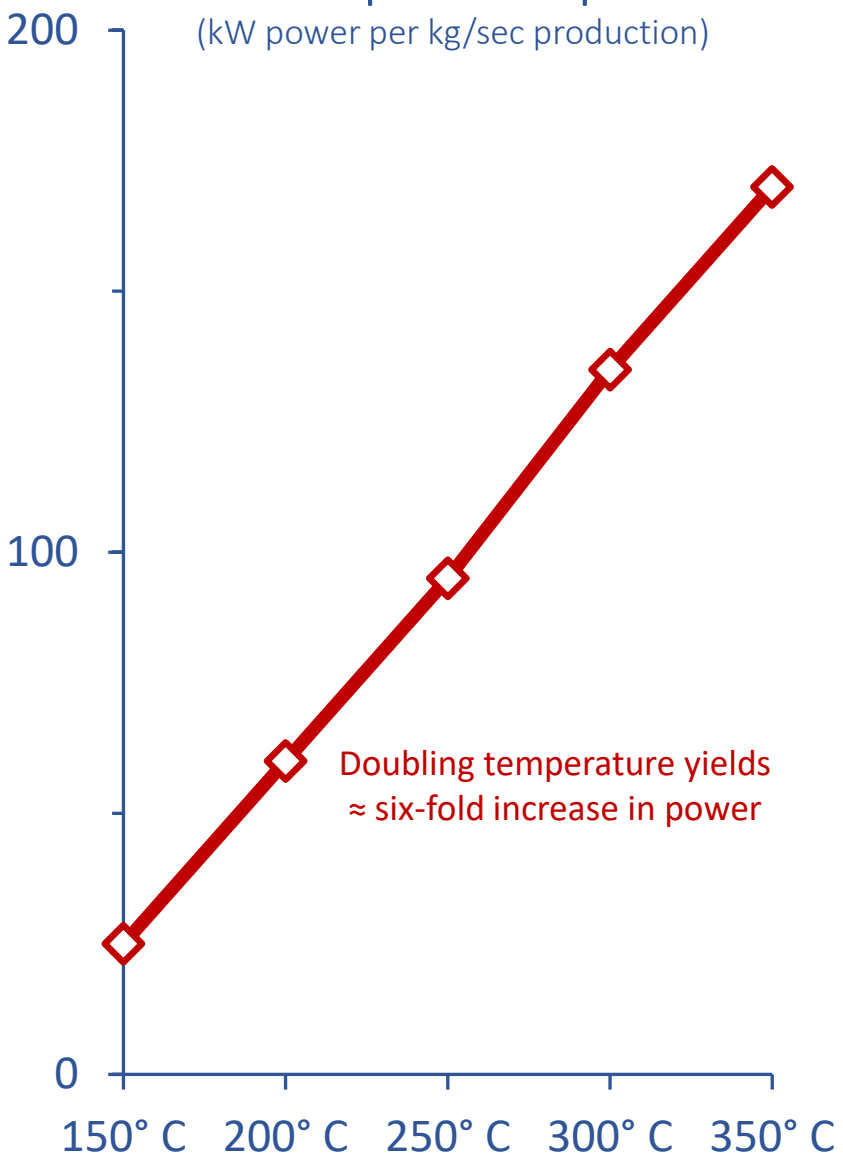
Super Hot = Super Productive

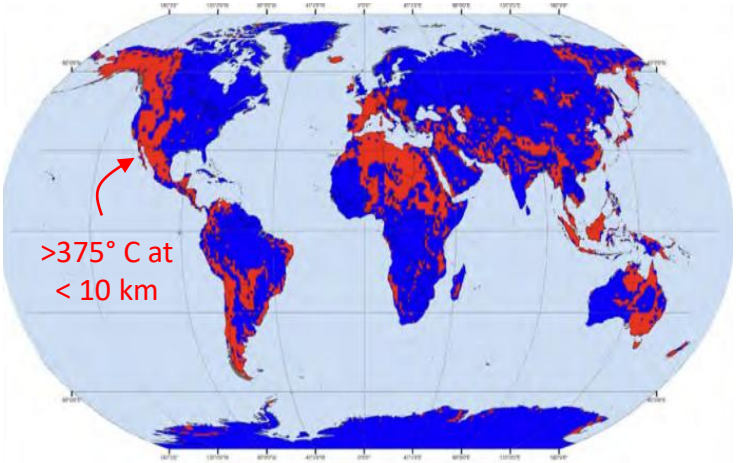
Power Output vs. Temperature

(kW power per kg/sec production)



Data shown is for Isobutane in an ORC geothermal plant; data from MIT (2006), DiPippo (2008), NREL

Play Fairway Mapping

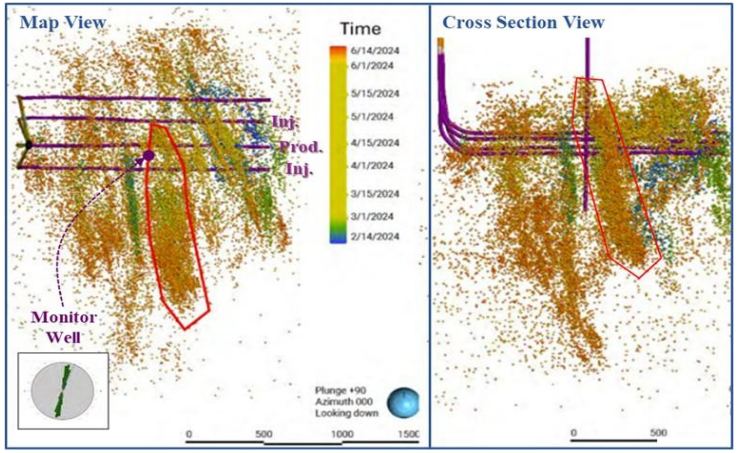


Source: CATF 2022

Prospect Identification

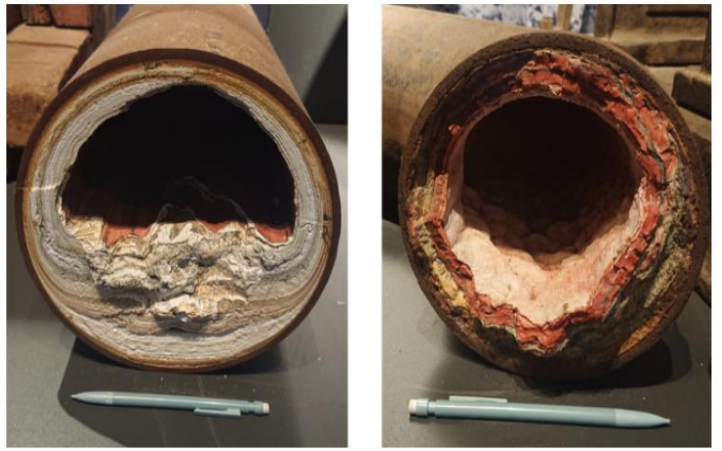
Source: IGNIS website

Reservoir Characterization



Source: Leveille and Zoback (2025); modified after Dadi et al. (2024)

High Temperature Geochemistry



Pictures from Anne Pluymaker, EGU Blogs, 2019

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