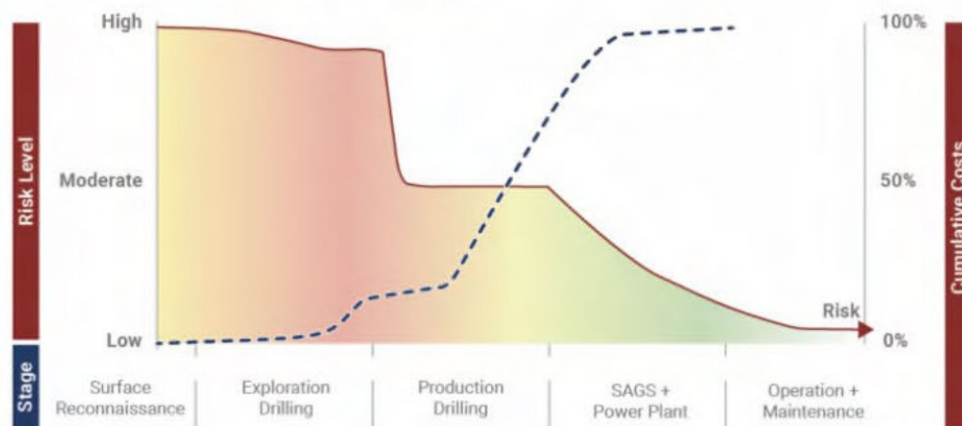


CLEARPATH

Program Concepts to Derisk Next-Gen Geothermal Projects

Next-generation geothermal resources have a **front-loaded risk profile**, concentrated during the resource confirmation phase of project development, which can crowd out institutional investors. Once a geothermal resource is characterized, the risk profile dramatically shrinks, providing an attractive investment opportunity.

Geothermal Risk Curve



Adapted from Comparative Analysis of Approaches to Geothermal Resource Risk Mitigation: A Global Survey. ESMAP, 2016.

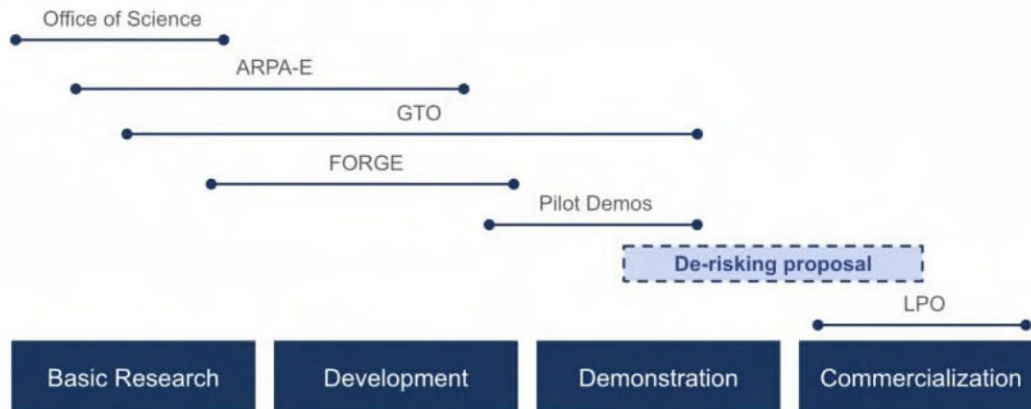
Next-generation geothermal projects engineer subsurface conditions using hydraulic fracturing technology adapted from the oil & gas sector, unlike conventional projects which require limited naturally occurring hydrothermal reservoirs. This technology offers great promise, but lacking existing commercial projects increases the perceived risk from private investors. Geothermal developers need to demonstrate replicability by developing projects in multiple geologic settings to accelerate learning rates, unlock lower cost capital and rapidly scale the technology.

DOE can provide non-dilutive capital (structured as loans, grants, or insurance) to projects that will drill and flow test wells, similar to the milestone based [Regional Carbon Sequestration Partnerships](#) program managed by the Fossil energy office. The program should stimulate projects at 10 sites located in multiple geologic basins to de-risk geothermal exploration. A program of this scale is likely to cost between \$200-\$250 million, with potential to recoup a significant portion of funds from successful projects depending on the program design.

DOE has been home to past efforts to catalyze conventional geothermal and hydraulic fracturing technology development. The User-Coupled Confirmation Drilling Program (UCDP) for hydrothermal in the 1980s featured a [variable cost-share structure](#) based on the success of the well. Functioning similar to a loan guarantee program to reduce developer risk, successful wells received little to no federal funding, while the government would cover up to 85% of the costs related to non-producing wells. While hydrothermal and next-generation technologies have important differences, their early-stage risk profile is similar.

The proposed program could be one means to fill a gap in DOE's current array of geothermal programs without requiring a multi-billion dollar demonstration program. When the Energy Act of 2020 was signed into law by President Trump, next-generation geothermal was still largely a theoretical concept. As a result, the existing research, development programs at DOE did not prioritize funding demonstration actions.

Geothermal Programs at DOE



Program Concepts:

- DOE could expand the Enhanced Geothermal Systems (EGS) [Pilot Demonstrations program](#) led by GTO for full scale projects. While not specifically focused on drilling, this 50-50 cost share program was authorized by the Energy Act of 2020 and signed into law by President Trump. The program has received 25-times-less funding than other reliable resource demonstration programs like advanced nuclear, carbon capture, and hydrogen.
- DOE could use Other Transaction Authority (OTA) to offer a variable cost-share structure to fill a short-term private sector financing gap to fund exploration drilling costs up to and including flow testing. This could be similar to the UCDP for hydrothermal in the 1980s.
- DOE could use existing LPO authorities to issue loans or loan guarantees for projects (or consortia of projects) located in multiple geologic basins, consistent with increased regional variation authority in the Title XVII program under 42 U.S.C. 16513 (f).

Additional considerations:

- Consistent with its recent Artificial Intelligence RFI, DOE should leverage federal sites to prove geothermal resources in multiple geologic basins and minimize permitting delays.
- DOE could serve as an initial “anchor customer” to buy expected power production, with the option to later sell the contract to private parties to recover costs. This is similar to capacity contracts in the Transmission Facilitation Program (TFP). For projects located at military bases, the Defense Department could be an offtaker consistent with [Defense Innovation Unit](#) (DIU) geothermal procurements and the recent [TradewindsAI solicitation](#).