

Next-Generation Geothermal: the new gold rush in North America?

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Theory / Method / Workflow

Geothermal energy isn't new. The industry experienced significant growth in the 70s and 80s, positioning the United States as the global leader in geothermal power with nearly 4 GW of installed capacity. As a clean energy source, geothermal offers great potential. However, high upfront costs, exploration risks, and technological limitations have stalled sector growth.

Historically, geothermal energy has been extracted from conventional hydrothermal resources: permeable heat sources where temperatures above 150°C can be accessed at depths below 3,000 m. These resources are found under specific geological conditions, making broader use of geothermal energy for power supply extremely challenging.

In recent years, next-generation geothermal systems (EGS, AGS, and superhot rocks) have enabled access to geothermal energy almost anywhere in the world. In North America, several startups have emerged, turning pilot projects into commercial ventures. Funding has significantly increased, and the policy environment is becoming more favorable. The power demand from data centers is acting as a powerful catalyst, with several power purchase agreements taking shape. Are these signs of a new race to "geothermal gold" in North America?

We have analyzed the next-generation geothermal market in the United States and Canada using our proprietary dataset, focusing on the following themes: the resource size accessible by next-generation geothermal technologies, the types and locations of projects being built, the companies driving progress, and whether the current policy and funding environment will support sustainable sector growth.

Results, Observations, Conclusions

The momentum in next-generation geothermal activity, the capital raised, and the developing favorable policy environment in the US and Canada indicate a promising future for the industry. While the US has already emerged as a leader in next-generation geothermal, Canada lags slightly behind. However, initiatives like the Alberta Drilling Accelerator could accelerate progress.

The region holds great potential for next-generation geothermal, though many projects still need to reach commercial scale. Conventional geothermal continues to dominate global drilling activity. To further boost the sector, significant technological advancements are necessary. So far, drilling technologies have only received 10% of next-generation geothermal investment, and this must increase to achieve the desired outcomes.

Novel/Additive Information

We leverage Wood Mackenzie's comprehensive coverage of the Power and Renewables and Upstream sectors to evaluate the state of next-generation geothermal in the United States and Canada. This analysis aims to highlight strengths, identify gaps, and propose solutions to ensure the sustainable growth of next-generation geothermal in the region.