How Next-Gen Geothermal Financing is Evolving at the Level of Innovation Clusters, Firms, and Technologies

Torsten Kolind, Soraya Bornaz, and Thomas Giehm

Underground Ventures

Keywords

Geothermal, technology, venture capital, financing, innovation, value chain

ABSTRACT

Underground Ventures has collected investment data, which show how geothermal financing is evolving at the level of innovation clusters, firms, and technologies. 203 funding rounds have been analyzed, covering 71 next-gen geothermal technology companies and 217 investors. Our dataset covers the period from 2007 Q3 up to and including 2025. In the largest study of its kind, we show that the investment market for geothermal technology continues to mature, with a growing and significant debt-financed stack from 2023 onwards. The industry benefits from knowledge spillovers from oil & gas, with almost half of all financed geothermal start-ups being founded by an entrepreneur from the O&G industry. North America is not only the region with the largest investors for geothermal innovation but is also a net importer of capital, attracting more net investments from abroad. The investor profile for geothermal varies from region to region, with government and corporates playing the primary role in Europe and with institutional investment funds playing the primary role in North America. Lastly, we show what technology areas in geothermal are attracting the most capital, and why certain areas need more financing in order for the industry to access hotter temperatures at deeper depths.

(1) Capital invested in geothermal tech has grown rapidly, and the types of financing has evolved from grants and equity to increasingly more debt as novel technologies increasingly move from lab settings to field deployment. This is mostly driven by tech-enabled project developers who, after validating operations in demonstration plants, have more predictable future revenues compared to start-ups that aim to sell a new type of equipment to the developers. As such, the evolution in the capital stack mirrors the commercialization path of EGS and AGS companies.

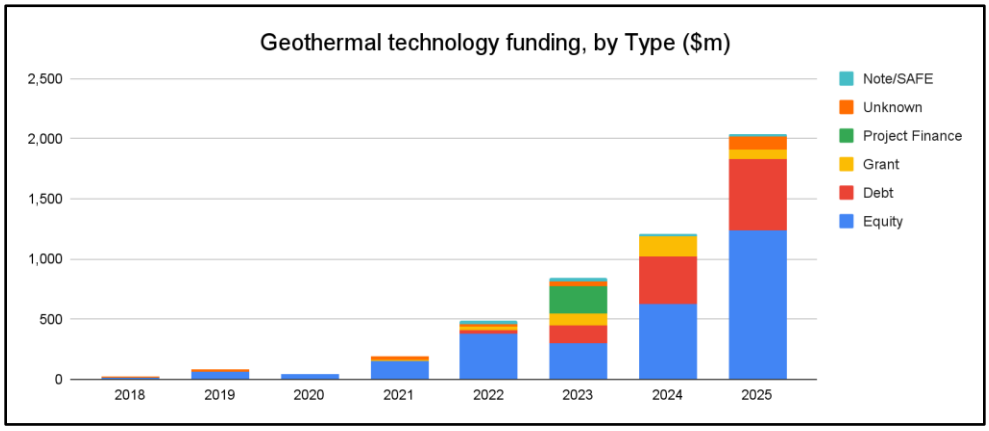


Figure 1. Investment growth by type of instrument.

(2) The O&G industry is closely connected to geothermal innovation clusters, spinning out alumni-entrepreneurs that go on to found geothermal technology companies. Our research shows that nearly half of next-geothermal companies that have raised funding have at least 1 co-founder with experience from the oil & gas industry. These individuals tend to partner with co-founders with experience from other industries, such as clean energy project development, finance, and academia.

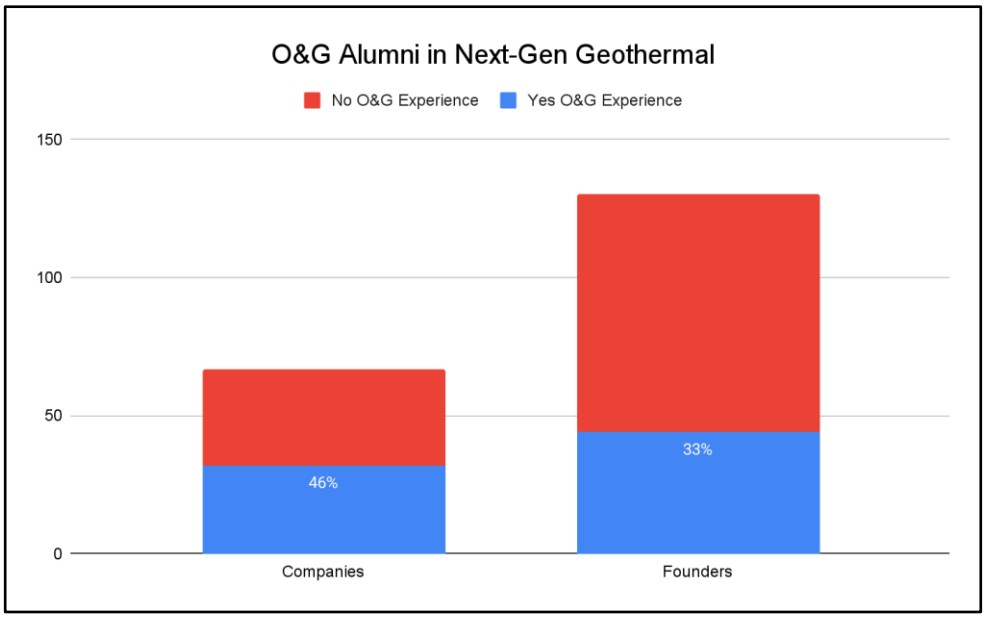


Figure 2. Share of O&G alumni in next-gen geothermal companies and founding teams.

(3) North America is the leader in next-gen geothermal, but, surprisingly, North America is also a net importer of capital from the world, particularly from Europe. Capital is invested into technology clusters such as Texas, California, and Alberta, Canada. There are a combination of reasons for this: most notably, (i) geo-economic: superior basin data availability, O&G workforce, existing drilling supply chains, and faster drilling timelines; and (ii) regulatory: North America offers lower regulatory friction, such as for EGS projects.

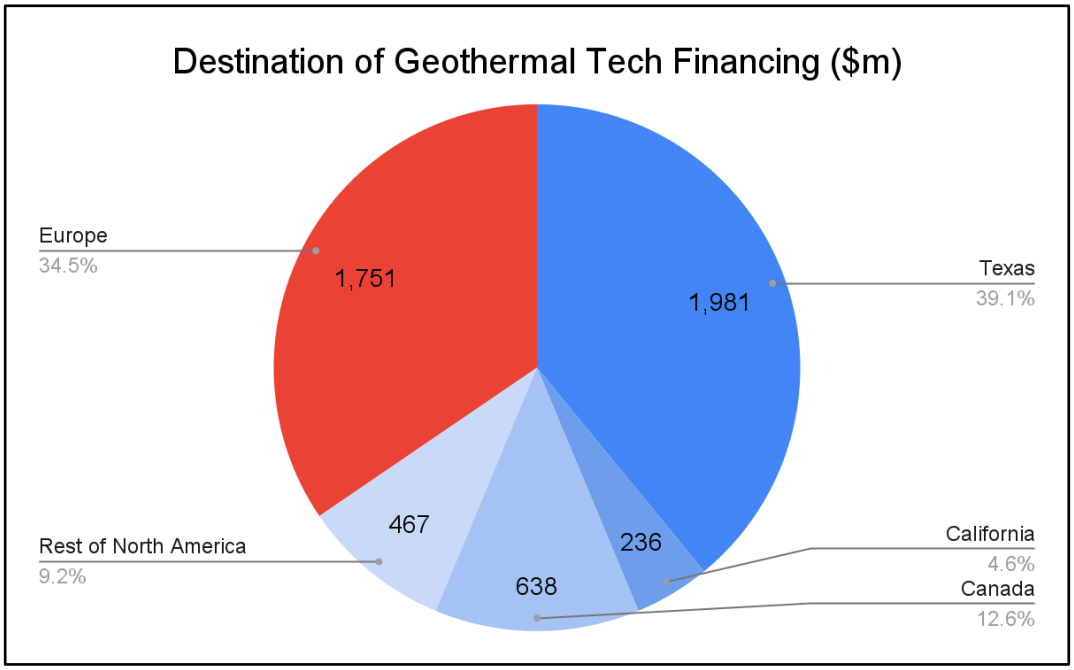


Figure 3. Geographical distribution of next-gen geothermal investments.

(4) European governments and corporations invest vastly more in geothermal technologies than their North American counterparts, but North American venture capital and traditional investment funds vastly exceed their European counterparts. North American investors account for 50% of capital invested whereas North American geothermal tech companies receive 66% of capital invested. This is primarily due to two dynamics: (i) on the supply side, larger North American capital markets, where larger pools of risk capital can finance high-risk start-ups and medium-risk scale-ups; and (ii) on the demand side, a larger number of geothermal start-ups in North America.

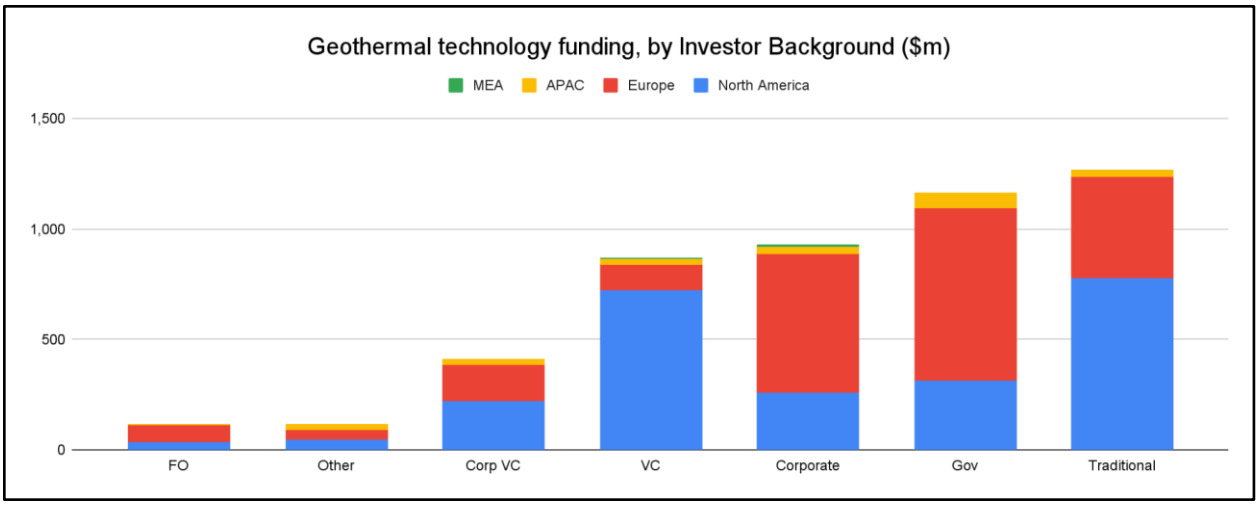


Figure 4. Breakdown of investor profiles across every region.

(5) Although investments in drilling technologies and reservoir stimulation have grown significantly in recent years, certain technologies such as well casing/completion and downhole tools have not attracted as much investment. The majority of capital invested today has been into enabling and scaling EGS and AGS with existing or improved technologies from oil and gas. Note that many EGS and AGS companies develop proprietary technologies inhouse, but this is not in the public domain, so we have not broken these into their respective technology areas. In order to scale SHR commercially, more technology areas necessary for superhot temperatures need to be financed.

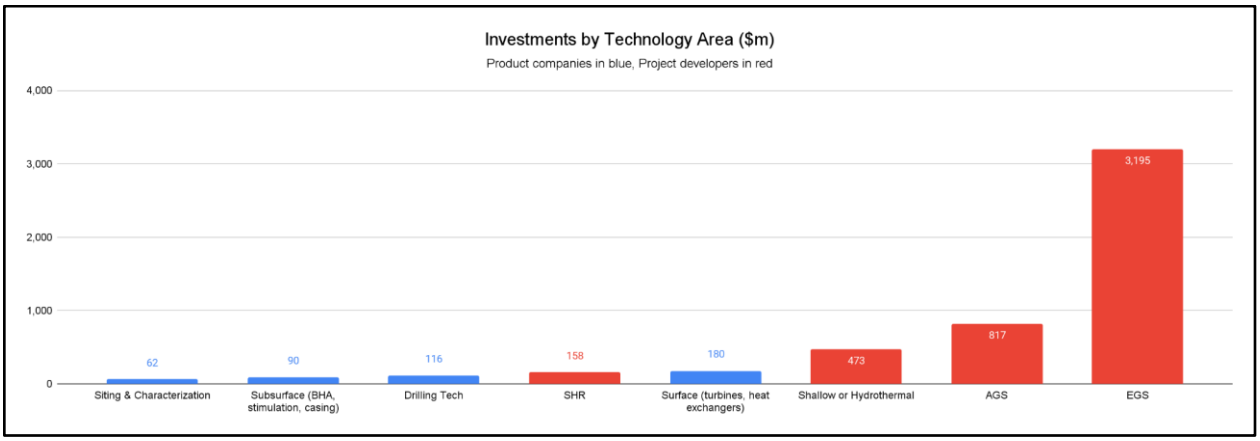


Figure 5. Funds raised across technology segments for product-oriented companies and project developers.