

Technology factsheet: Competitiveness of clean energy technology – Deep Geothermal

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Key emerging technologies & uses

Geothermal technologies have been widely used for decades to generate power as well as, in some places, for heating. Advances in the technology and its uses are being made.

tech 1

Technological Readiness Level (TRL 4-6): Integration of geothermal electricity and heating & cooling in the energy system responding to grid and network demands; Improvement of overall geothermal energy conversion performance for electricity and heating & cooling generation; Closed loop electric and heating & cooling plants integrated in the circular economy

tech 2

TRL 7: Geothermal heat in urban areas

Key value chain figures

- **Sector turnover:** EUR 0.8 billion (2020) in EU – highest in Netherlands, Italy and France
- **Employment:** 6 100 in EU (2020)



Key facts

Fact 1

Deep geothermal energy for electricity generation has seen steady growth in several countries, reaching a total installed capacity of 14.9 GW at the end of 2022 and an annual growth rate of 3% over the last decade. The EU's net capacity was 877 MWe (megawatt electric) in 2022, but growth is well below the global trend.



Fact 2

Geothermal energy is a mature and commercially proven technology that can provide a low-cost energy supply without the intermittency associated with many renewable energy sources. Geothermal resources such as enhanced geothermal systems (EGS) or hot, dry rocks (HDR) are less mature and have higher costs due to deep drilling requirements and additional stimulation measures. Innovative deep geothermal projects still face the problem of high-risk up-front expenses and often complicated licensing issues.

Fact 3

The EU has continued its support for the sector with several projects being funded under Horizon Europe, and the Innovation Fund has awarded grants for one large-scale and one small-scale geothermal project.



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