PRIN 2022 PNRR PROJECT

InGEO

Innovation in **GEO**thermal resources and reserves potential assessment for the decarbonization of power/thermal sectors

Finanziato dall'Unione europea
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Consiglio Nazionale delle Ricerche
Institute of Geosciences and Earth Resources
igg

Università degli Studi di Padova
Dipartimento di Geoscienze

Università degli Studi di Trieste
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Main project topics

To increase the share of energy produced from renewable sources, the development of geothermal energy in Italy must be accelerated. InGEO responds to this need by improving knowledge of geothermal resources and the energy they contain for various uses. The project addresses several technological challenges:

- develop an effective assessment of deep geothermal resources taking into account local geological conditions, regime and heat exchange capacity;
- devise operational solutions for energy production and underground heat storage, optimising thermal performance;
- validate with a real case-study the approaches being developed in a regional-scale area. The reconstruction of crustal and sub-crustal structures and temperature distribution of the buried folds of the Po Valley sector will be the input for the calculation of the geothermal potential, considering different applications (power production, district heating, process heat and combinations) and underground energy exchange technologies (open and closed loops).

Expected products

- A database of petrophysical rocks' parameters.
- A 3D model of the shallow lithospheric structures of the study area based on the integration of the data collected, acquired, analysed, and interpreted in the project.
- A review on deep geothermal potential assessment.
- An Open Source software tool accessible through a web-GIS application for computing the deep geothermal potential with variable heat extraction modes and production rates.
- The thermal performance of deep closed-loop heat exchanger as a function of environmental, design and operating variables.
- Geothermal potential maps of the study area.