

Geothermal Energy: the impact of EU R&D funding

Bioenergy | Biofuels | Geothermal | Hydropower | Ocean | Solar PV | Solar thermal | Wind

OBJECTIVES

A comprehensive study of geothermal energy research and development (R&D)

support within the EU over the past 20 years

of the geothermal energy sector

Identify the impacts of EU R&D support

Understand how the geothermal

energy sector has developed

METHODOLOGY

COLLECTION ACTIVITIES USING A RANGE OF METHODS

EFFECTIVE DATA













LITERATURE

REVIEW



KEY FIGURES:



geothermal energy projects funded through the

37

Programmes (FP5-Horizon 2020)

€40 m

R&D budget grew

from an average of

Framework

Programmes (FP5-Horizon 2020) for geothermal

€90 m

EU funding through

the Framework

technologies

Top 4

systems, making it the most funded **R&D** topic

40 %

of funding to

enhanced geothermal

86%



€5 m per year (pre 2000) to an average of €40 m per year

(2011 onwards)

3. Italy 4. Netherlands

1. Germany

2. France

energy R&D funding is from the Top 4 **Member States**

of geothermal



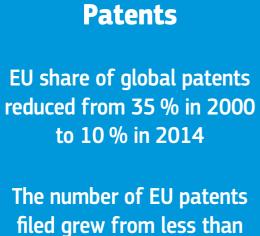
The EU region ranks among the top regions in terms of geothermal

R&D funding, with budgets comparable to those for the USA

Publications

IMPACT ON KNOWLEDGE

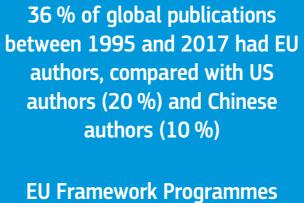
GENERATION



40 per year in the early 2000s to more than 100 per year between 2007 and 2010.

From 2011 onwards, EU patents

average 60 per year



funded top publishing

organisations and many projects

that delivered publications

IMPACT ON SECTOR

DEVELOPMENT



Additional impacts

EU Framework Programme funding

EU Framework Programme funding helped to improve the appraisal of geothermal systems and enabled high-risk high-reward geothermal

projects, contributing to the

economics and wider applicability

of geothermal systems

from 1 500 MW in 1995 from 500 MW in 1995

€250 million+

average exports per year

3 500 MW

installed capacity for

heat generation in 2016, growing

(2011-2015) to the rest of the world

sector in 2016

0.21 %

gross final electricity

consumption from

geothermal energy

in 2016

8 600

people employed in

EU geothermal energy



EU geothermal energy sector turnover in 2016

€1 billion

800 MW

installed capacity for electricity

generation in 2016, growing



at less optimal locations leads to higher costs

Mixed picture on

costs. Technology

development reduces

costs, but application



geothermal energy in 2016

consumption from

O.15 %)) gross final heat



• 20 novel methods and techniques validated in industry

Integrated Methods for Advanced

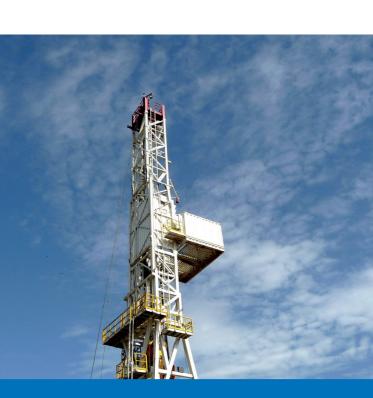
Geothermal Exploration

IMAGE

that enabled a €200 000 saving per geothermal project

· Example: Algorithm developed

· Further testing and implementation with industry partners underway



AMBient of continental Europe Evaluating existing equipment in supercritical conditions – testing at

Drilling in dEep, Super-CRitical

DESCRAMBLE

- a depth of 2.9 km in a temperature of between 507 °C and 517 °C · A first-of-a-kind pressure/temperature (P&T) logging tool
- Developing simulation software for geothermal reservoirs to better predict the production scenarios of projects operating in supercritical environments