Information on each selected project

WP 6 – Delivery number D6.2 – Call 2

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Information on each selected project

WP 6 – Delivery number D6.2 – 2nd Call

GEOTHERMICA D6.2

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2.0	February 2021	Information on accepted projects

Executive summary

The overall aim of the GEOTHERMICA project is to accelerate the deployment of geothermal energy in Europe by pooling national and EC funds for research and innovation to fund projects focusing on improving business cases for geothermal energy and establishing a long-lasting strategic collaboration of national geothermal research and innovation program owners and managers of the GEOTHERMICA consortium.

GEOTHERMICA's second call's objective is to launch projects that accelerate the piloting, demonstration and validation of novel concepts of geothermal energy supply within the energy system and identify paths to commercially viable deployment. Projects may also address oriented research that underpins novel concepts and approaches to commerciality.

This 2nd additional joint call funded seven projects, four Type A, large trans-national demonstration projects with a total budget of €19 million, and three Type B, smaller trans-national research and innovation projects with a total budget of €5 million. The total budget funding in this 2nd additional joint call is around €24,5 million.

Descriptions of these projects can be found at the GEOTHERMICA website - http://www.geothermica.eu/projects/call-2/. The website is described in this report.

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Introduction

One of the objectives of GEOTHERMICA is to support public-public partnerships between EU Member States, Associated and Third Countries, including joint programming initiatives and joint calls. The GEOTHERMICA ERA-NET Cofund (GEOTHERMICA) is a five-year action financed under the European Union's Horizon 2020 Programme for Research and Innovation. GEOTHERMICA aims to support transnational, collaborative innovation projects in geothermal energy through joint calls and carry out other joint activities, which will enhance the coordination of public research and innovation programmes and improve the exploitation of results of the projects funded. GEOTHERMICA's partners have executed a first cofunded call with the European Commission's financial support in 2017 and a second call without the European Commission's participation in 2019. The GEOTHERMICA call is a two-stage process. Stage 1 asks for pre-proposals, and Stage 2 asks for full project proposals.

GEOTHERMICA's second call's objective is to launch projects that accelerate the piloting, demonstration and validation of novel concepts of geothermal energy supply within the energy system and identify paths to commercially viable deployment. Projects may also address oriented research that underpins novel ideas and approaches to commerciality. This second joint call of GEOTHERMICA resulted in seven grants awarded to four types A projects and three type B projects.

Deliverable D6.2 is showcased in details as a webpage with information on each selected project: http://www.geothermica.eu/projects/.

This deliverable (D6.2) is shortly described in this report.

1 Information about cofounded projects on the website

The projects description is presented on the GEOTHERMICA website under the link http://www.geothermica.eu/projects/call-2/. The cofounded project's website is a communication and dissemination channel for the project's results and engaging with the stakeholder community.

The subpages for Call 2 website were developed in August 2020 and made public on February 2, 2021. Call 2 subpages are open for the public, and each project has its description, including partners and funding received. There is also a spot for dissemination and outreach activities delivered during the project's lifespan.

The landing page http://www.geothermica.eu/projects/call-2/ presents a general description of the second call's objective, list of projects and budget allocated by national funding agencies and project partners. There is a menu list where established projects are presented and linked to separate pages with details on each project on the right side.

To facilitate the website management, GEOTHERMICA Office staff will be managing the platform after receiving the input from each cofounded projects' main coordinator and distributing it to the public and stakeholders regularly. Updates will be routinely posted in coordination with the project's periodical reporting basis or more frequently, depending on the project's activities.

Below presented a description of each project and more information accessible via the website:

1.1 DEEP 200320

The Nov. 2017 Mw 5.5 Pohang earthquake in South Korea induced during the reservoir creation phase of a deep geothermal energy project represents a significant setback and tremendous challenge to future deep geothermal energy exploitation. Recent advancements in sensor technology, combined with new machine learning-based data analysis techniques, are opening new horizons to manage induced seismicity. The project DEEP aims to build and test the next generation of sensors and data analysis tools for induced seismicity monitoring, risk assessment and mitigation in real-time, with the final aim to manage deep geothermal operations safely. We will demonstrate these new technologies and processing workflow at the Utah FORGE EGS site France and Germany and transfer the technologies and software to other sites in Europe, for example, to the Haute-Sorne project in Switzerland.

The information available online see http://www.geothermica.eu/projects/call-2/deep

1.2 RESULT 200317

For clean cities (mission horizon Europe), geothermal reservoirs are prospected to be developed in many urban areas to replace fossil fuel-fired heating. In many urban areas, geothermal reservoirs' development is challenging - even if the subsurface reservoir conditions are relatively well known. The main objective is to demonstrate the potential for increased performance by 30-100% of major (marginal) reservoirs for heating in urban areas in the northern EU.

RESULT achieves this by deploying 1) optimisation methods and drill and learn strategies, 2) reservoirs models and uncertainty assessments, 3) best in class well technology options, 4) reservoir development optimisation in different settings in Europe. The innovative procedure and techniques will be 5) used and demonstrated in asset development and drilling a geothermal doublet.

Information available online see http://www.geothermica.eu/projects/call-2/result

1.3 GRE-GEO 200314

The project objective is to develop a cost-reducing, large diameter, a glass-fibre reinforced epoxy piping system suitable for geothermal well application (GRE-GEO). The project will include the much-needed well guidelines and tools for the installation of the GRE casing. This will integrate the end product into the market. The casing system technology and materials' improvement is a significant advantage compared to the steel-based casing systems. High corrosion resistance significantly prolongs the overall lifespan of the well compared to conventional steel casing designs.

The information available online see http://www.geothermica.eu/projects/call-2/gre-geo

1.4 SPINE 200313

SPINE is developing new tools for stress profiling in the crystalline rock to estimate stimulation efficiency and seismicity related to subsurface heat exchangers' creation. The 3D borehole wall displacement and injection pressure allow estimating the full 3D stress tensor. LBNL invented this instrument and will provide the partners with lessons learned to date. Solexperts will test the instrument for industrial geothermal applications. ETH will demonstrate the benefits of stress profiling with this new technology through extensive field-scale testing. Datasets from two Underground Research Facilities will be shared. RWTH will reproduce protocols at a laboratory scale. UNINE and CNRS will validate inversion protocols. Geo-Energie Suisse will integrate the procedures

in their planned geothermal projects. Lessons will apply to sites in the USA (FORGE) and Switzerland (Haut-Sorne).

The information available online see http://www.geothermica.eu/projects/call-2/spine

1.5 DEEPEN 200312

Most high-temperature geothermal resources are found in magmatic plays. In this project, we will develop a methodology for de-risking magmatic geothermal systems, including super-critical plays. First, we will develop a toolbox of geophysical, geochemical, and geological tools to map and characterise magmatic systems and faults in non-sedimentary rocks, from regional scale to prospect scale. This includes methods traditionally used in geothermal exploration and methods adapted from the oil and gas industry. Cross-disciplinary integration will be performed using Play Fairway Analysis, with a focus on the three risk elements (1) heat source, (2) recharge and (3) producibility. The methodology will be demonstrated on exploration cases in Iceland and the US.

The information available online see http://www.geothermica.eu/projects/call-2/deepen

1.6 TEST-CEM 200318

Making geothermal wells sustainable reduces financial risks, attracting investments in geo-energy. An essential risk in these wells is cement's durability providing well integrity under extreme temperatures (high-enthalpy wells), large temperature variations and chemically-aggressive environments common for all geo-wells. Current cement solutions either have problems under these conditions or have not been validated for durable, well-applications. This project aims to reduce risks associated with compromised well integrity and use recently gained insights in the field of materials to evaluate advanced cement systems in a wide temperature range (up to super-critical) and under thermal cycling, raise their current TRL to 5-6 by optimising and validating them in the laboratory and large-scale experiments and enabling operators to select a preferred cement formulation for target conditions.

The information available online see http://www.geothermica.eu/projects/call-2/test-cem

1.7 SEE4GEO 200323

Geothermal systems involve the injection of large amounts of fluid into the subsurface. Identifying fracture networks will significantly help to (1) assess geothermal resources by mapping pre-existing fracture networks, and (2) inform on stimulation successes and risk mitigation by mapping newly activated fracture networks. Traditional seismic imaging techniques fail to resolve fluid-phase properties, while purely electromagnetic (EM) approaches provide limited, low-resolution constraints on the rock structure. Seismoelectric effects (SEE) arise from the seismic-to-electromagnetic conversion is naturally charged porous media with a certain degree of fluid saturation. With SEE, we leverage seismic and EM technique sensitivities. In this project, we offer an integrated SEE assessment for geothermal systems relying on numerical modelling, laboratory experiments and field surveys.

Information available online see http://www.geothermica.eu/projects/call-2/see4geo

2 Conclusions

The webpage described in this report covers the information already available on the GEOTHERMICA website. The description of the deliverable patents, filling, are submitted to GEOTHERMICA Office, and the public once will be available online at the time od due date. Currently, none of this is applicable at the time of writing this report.

References

Application documents of Call 2 cofunded projects

Website: www.geothermica.eu, retrieved on February 26, 2021

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