

The aim of GeoWell

The project aims to develop reliable, economical and environmentally friendly technologies for design, completion and monitoring of high-temperature geothermal wells with the intent to expedite the development of geothermal exploitation globally. GeoWell will address all relevant steps in the geothermal well completion process to enhance the lifetime of high-temperature geothermal wells. These include cement and sealing technologies, material selection and coupling of casings. Methods of temperature and strain measurements in wells, using fibre optic technologies to monitor well integrity, will be developed as well as methods for risk assessment with respect to the design and operation of high-temperature geothermal wells.

To assure an outstanding quality of the approach and the final results of the project, the research is focused on both traditional production wells and deeper wells where the pressure is as high as 150 bar and temperatures exceed 400°C. The developed technologies will be tested under in-situ conditions in laboratories, and also in existing geothermal environment, moving the TRL (Technology Readiness Level) from 3-4 to 4-5.



Partners



ÍSOR, Íslenskar orkurannsóknir
Iceland GeoSurvey (Iceland)



IRIS, International Research Institute
of Stavanger AS (Norway)



Helmholtz-Centre Potsdam
GFZ German Research Centre
for Geosciences (Germany)



TNO, Nederlandse Organisatie Voor Toegepast
Natuurwetenschappelijk Onderzoek
(Netherlands)



BRGM, Bureau de Recherches
Geologiques et Minieres (France)



Statoil ASA (Norway)



HS ORKA HS Orka hf. (Iceland)

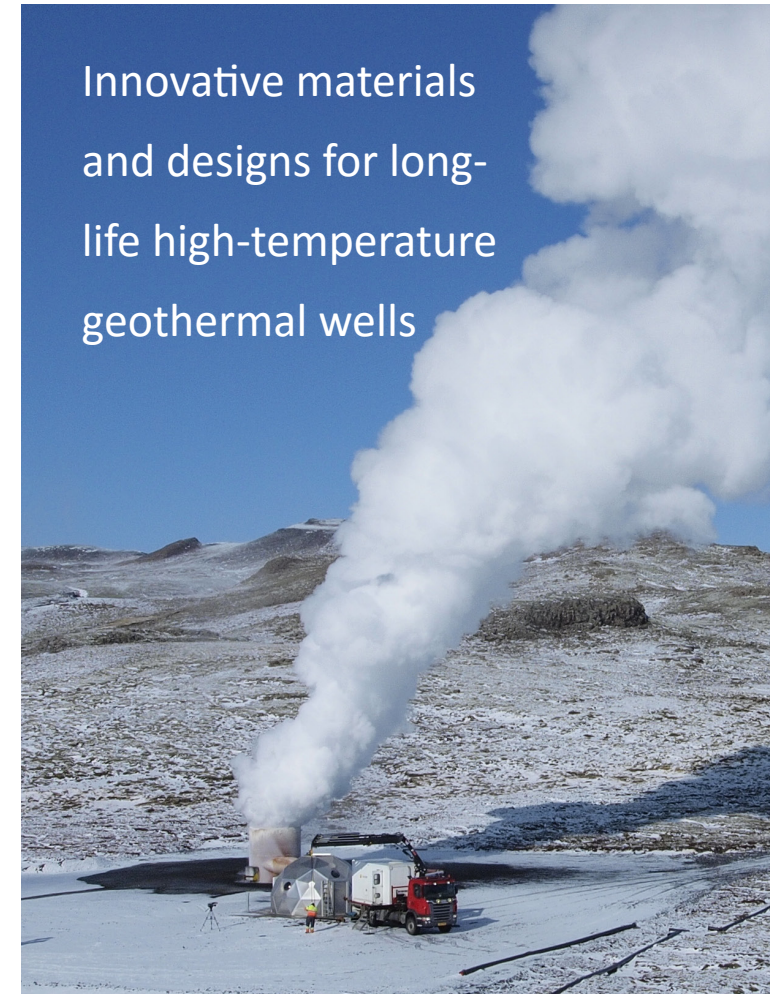


Akiet BV
(Netherlands)

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Innovative materials
and designs for long-
life high-temperature
geothermal wells



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Project segments

Cement

Develop cement and sealing technologies optimized for high-enthalpy geothermal applications in order to ensure casing protection and zonal isolation at elevated temperatures and pressures (up to 450°C and >100 bars).

High-temperature composite casings (HTCC)

Assess the potential of using high temperature composite casings in geothermal wells. HTCC will be designed and tested in laboratories.

Flexible coupling

Design and test flexible couplings for casings where thermal expansion due to heating or cooling is allowed with lower strain on the casing material to ensure well integrity.

Casing materials

Standard and innovative casing materials will be tested to withstand temperature loading and aggressive geothermal environment to ensure a long lifetime of casings. Cladded casing materials will also be tested.

Well monitoring

Identify processes that affect the integrity of a geothermal well by developing and testing distributed fibre optic sensing technologies to simultaneously measure temperature, strain and acoustic noise within the cemented annulus of a geothermal well.

Risk assessment

Develop risk and reliability analysis tools for risk assessment of geothermal wells, both high enthalpy wells and extreme temperature wells in volcanic areas.

The GeoWell project will address important bottlenecks in geothermal development like high investment and maintenance costs by developing innovative materials and designs that are superior to the state of the art concepts. This will significantly enhance the current technology position of constructing and operating a geothermal well.

The strength of the GeoWell consortium lies in the long and broad experience of the partners and the specific competence that each of them has within their field of expertise. The partners have access to world-class research facilities for validation of innovative technologies by testing in laboratories and existing geothermal environment. This will ensure a successful project implementation.

Renewable energy in 2020

In 2008, European countries agreed the ambitious target to increase the use of renewable energies to 20% of the European energy consumption by 2020, in particular through the Horizon 2020 program. The GeoWell project will contribute to the 2020 goal by providing new and improved well technology for high-temperature geothermal energy generation.