Synergetic Utilisation of CO2 storage Coupled with geothermal EnErgy Deployment

Publieke samenvatting / Public summary

Doelstelling

Research and demonstrate the feasibility of utilising produced CO2 for re-injection in a geothermal field to -maintain and enhance reservoir pressure as the driving mechanism for the geothermal fluid and improve geothermal performance, while also storing the CO2 that is currently vented to the atmosphere in most geothermal fields, -test and demonstrate new monitoring technologies, such as the new environmentally friendly seismic monitoring EM-vibrators and highly sensitive distributed fibre-optic acoustic sensing systems (DAS), besides the more conventional pressure, temperature, geochemical and tracer monitoring, -increase reservoir permeability and productivity while suppressing scaling by artificial acidification, -provide a real field environment for the testing of supercritical CO2 injection into a carbonate reservoir and, at the same time, -provide the geothermal energy sector with the means to address the current climate change challenge through CO2 utilisation and storage.

Korte omschrijving

An existing well at the active geothermal power generation site Kizildere, Turkey will be used to inject produced and captured, but mostly vented to the atmosphere, CO2 into the reservoir at supercritical state. In addition, the site will provide the only functioning field-scale pilot project of supercritical CO2 injection into a geothermal field in a carbonate reservoir system with unique opportunities for testing & developing innovative monitoring systems. The second project site is the

Projectinformatie / Project information

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Algemene informatie / General information

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Hellisheidi geothermal field, Iceland where industrial scale CO2 injection and permanent mineral storage in basalts has been practised since 2014. Project sites provide the opportunity for testing and further development of the new and novel vibratory-type seismic sources; a new higher signal/noise ratio iDAS (distributed acoustic sensing by dense receiver array) that provides data for layer-specific seismic monitoring capability in the borehole for CCS/CCUS and geothermal applications.

Resultaat

-Strategies for pressure management in geothermal reservoirs through CO2 injection and storage to extend the operational life of wells/fields with commercial benefits -Field testing of a novel vibratory-type seismic sources & a new higher signal/noise iDAS system to provide layer-specific seismic monitoring capability -Understanding of fundamentals of field scale behaviour of injected CO2 in geothermal reservoirs and critical assessment of the theories developed at laboratory scale so far -Insights into the potential for injection induced seismicity in geothermal fields through monitoring and evaluation of data from a local seismic network -Testing, assessment of the effectiveness, and validation of a number of CO2 injection and plume monitoring in carbonate reservoirs -Development of technoeconomic assessment methods for geothermal/CCUS - Development of flexible and modular life cycle inventory model -Development and demonstration of an innovative CCUS technology to accelerate CCS

De data in deze applicatie is afkomstig van de Rijksdienst voor Ondernemend Nederland (RVO) en wordt in samenwerking met de Topsector Energie ontsloten.
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