DESTRESS

Newsletter #8 / July 2019

View this email in your browser

Website Mail us

More potential to achieve DESTRESS goals

DESTRESS did not only gain new geothermal sites to test its soft stimulation concept (Mezőberény, Geldinganes and Bedretto) but also additional time to execute the experiments and deliver anticipated results. Some tasks were granted an extension until November 2020 to complete their activities.

During the past months, DESTRESSused many opportunities to exchange with the geothermal community, it was represented at the European Geothermal Congress EGC 2019 in The Hague, The Netherlands, and contributed to the H2020 Risk Assessment Workshop in Potsdam, Germany. Besides, our new demonstration site in Bedretto, Switzerland, was officially inaugurated, providing the press and the public a glimpse into our work.

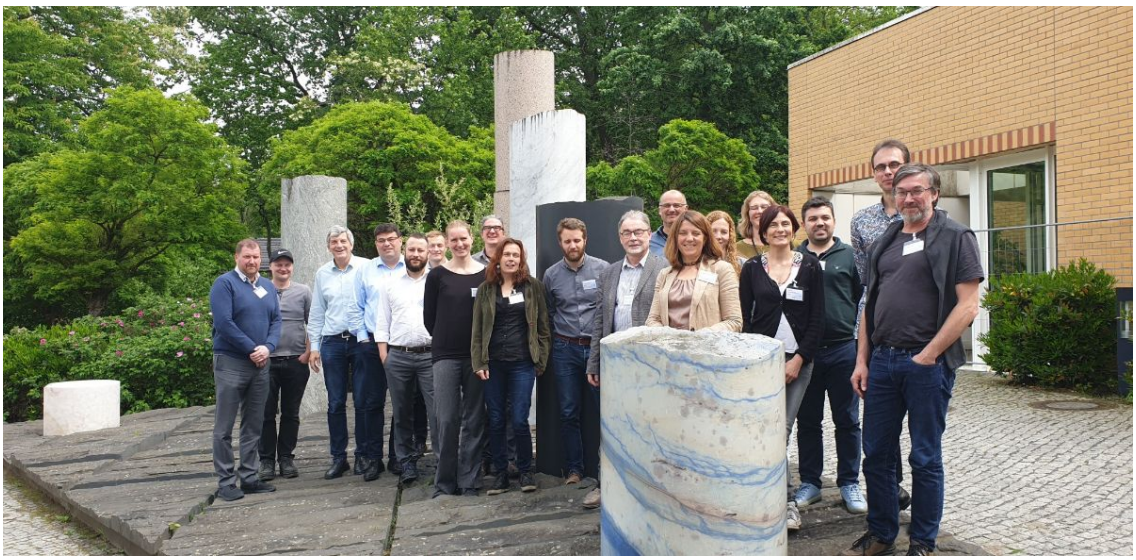
Additionally, an extensive research study on the key performance indicator analyses based on Monte Carlo simulation was finalised, and soft stimulation risk management guidelines and workflows were completed. You can find out more about the results in this newsletter.

Last but not least, four stimulations are currently in preparation. We will report on them in detail in the next edition. As the next experiment expected to start soon will be executed at our Icelandic site in Geldinganes, we will shortly present the plan below.

News and Progress

Fruitful H2020 Risk Assessment Workshop

On 28 May 2019, the workshop "Risk Assessment for Geothermal Energy Projects" took place at GFZ Potsdam, Germany. A total of 25 participants from different European academic research centers and the industry discussed the current state of risk assessment. The workshop identified three important points to focus on: It was noted that harmonized protocols and guidelines, communication with authorities as well as with the public played a key role in risk assessment. Steps were discussed how this could be achieved and what had to be considered in order to do so.



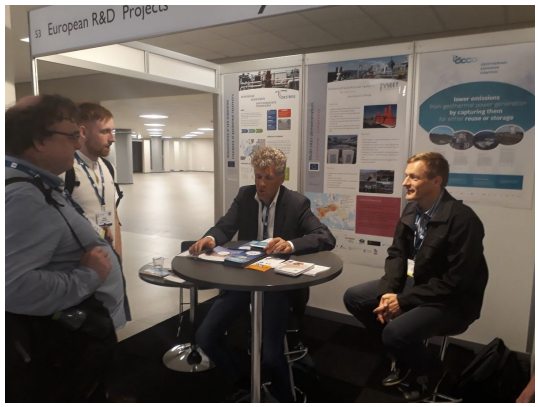
DESTRESS at EGC 2019

DESTRESS participated in this year's European Geothermal Congress in The Hague, The Netherlands. The event took place from 11 to 14 June 2019. During these four days, six presentations were held about different topics:

- Injection-triggered occlusion of flow pathways and its remediation in Mezőberény, Hungary (GFZ)
- Modeling the effect of hydraulic stimulation strategies on fault reactivation and induced seismicity (TNO)
- Semi-analytical fault injection model: effect of fault roughness and injection scheme on induced seismicity (TNO)

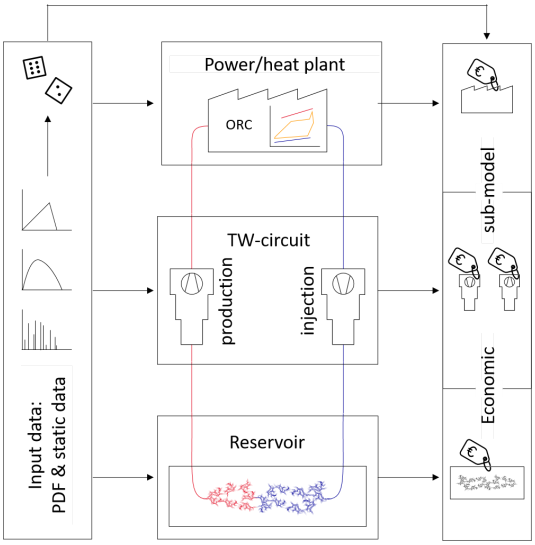
- Exploration and Monitoring with Distributed Acoustic Sensing at the EGS Site Groß Schönebeck (GFZ)
- Hydraulic connectivity in Pannonian Sandstones of the Mezobereny geothermal doublet (UoG)
- A fast model for THM processes in geothermal applications (TNO)

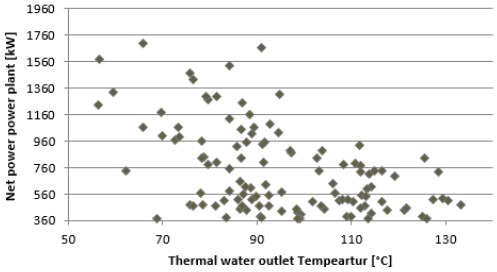
In addition, DESTRESS shared a booth with other Horizon 2020 projects: GEMex, GECO, DEEPEGS, MEET ESG, and SURE, and received interesting feedbacks from booth visitors.



New study on risk factors and economic evaluation

DESTRESS shall demonstrate the application of stimulation techniques in different plays. The overall goal is an improvement of hydraulic reservoir parameters with minimal impact on environment and residents. Besides the applied research, the investigation of risk factors as well as the economic effect of soft stimulation are a major part of the DESTRESS project. A recently completed deliverable (D2.2) combines the topics uncertainty / risk factors and economic evaluation. The integration of uncertainty in general and uncertainty of risk factors in particular, is a further development step in the techno-economic evaluation of geothermal energy. For project developers / operators, the risk mitigation is part of the decision process. Therefore, mitigation measures and the evaluation of mitigation measures are also analyzed. One subject of the study at hand is a techno-economic model of geothermal heat and power plants which is developed to determine the impact of technical and economic risk factors on selected key performance indicators of heat and electricity provision. For the derivation of general statements and to demonstrate the practical application, the model is used on the cases of selected DESTRESS research sites.





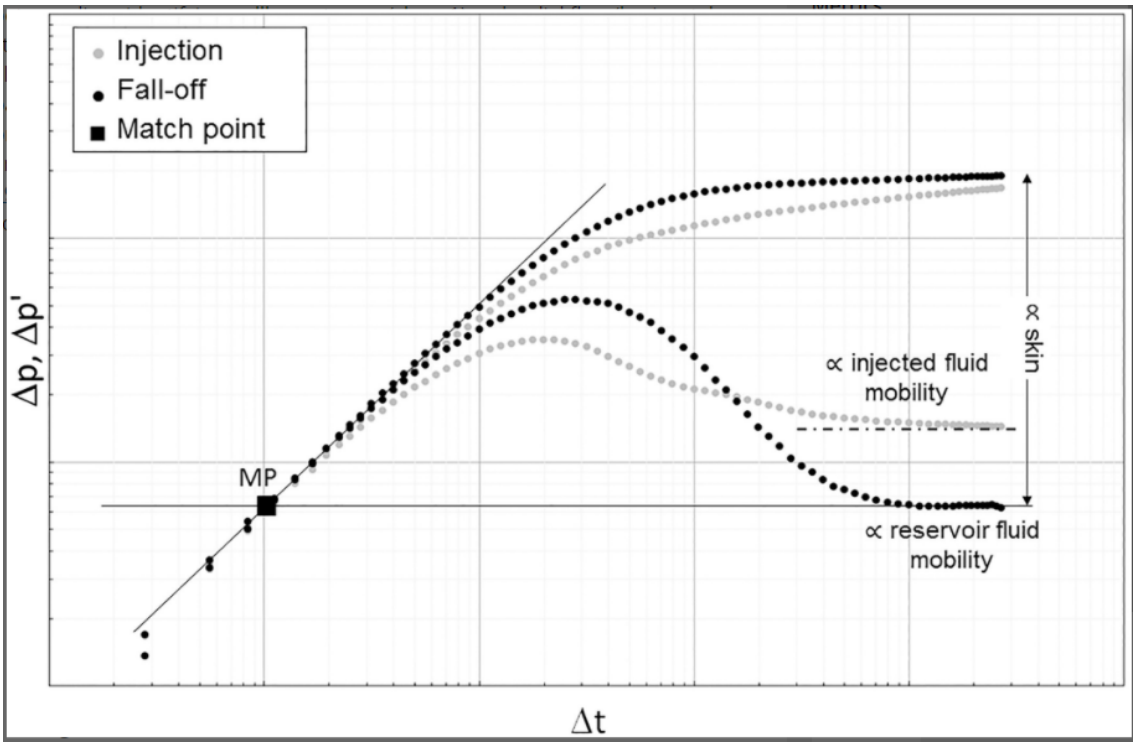
Geldinganes well RV-43 stimulation in Reykjavik (Iceland) on track

Geldinganes is a peninsula within the city limits of Reykjavik. It is foreseen to develop this geothermal field within the coming years to meet the growing heat demand of the city of Reykjavik. As a first step, the ~1,550 m deep low productivity well RV-43 will be hydraulically stimulated to increase its future contribution to the district heating network. At this site the cyclic soft stimulation concept and the multi-stage concept will be applied to minimize potential seismic risks and to demonstrate a controlled stepwise productivity increase of the well.

A permanent local seismic monitoring network is in operation since 2018 and this week additional surface stations are being installed by GFZ. In mid of July the 17-level GFZ geophone chain will be installed in a neighboring deep well to increase the resolution of the network. The network design and automatically detected seismicity can be accessed by everyone in real-time with the provided links. The real-time seismic monitoring is the basis for the traffic light systems and advanced seismic analysis will be performed by different groups in near real-time. A risk assessment report from ETH Zürich is currently being finalized and will be updated in near real-time by the first field application of the advanced traffic light system, which was developed in the framework of DESTRESS. Additionally, a conventional seismic traffic light system is applied and volumes and energies are closely monitored. With the tendering for the operation starting this week we are on track to performed the stimulation in September 2019.

New article on harmonic pulse testing published

A new article titeled "Harmonic Pulse Testing for Well Monitoring: Application to a Fractured Geothermal Reservoir" was published in Water Resources Research by DESTRESS WP 5 "Demonstration of cyclic hydraulic and multi-stage treatments in granites and tight sandstones". It discusses Harmonic Pulse Testing (HPT) that aims to determine well and formation parameters such as wellbore storage, skin, permeability, and boundaries within the investigated volume. The advantage is that it does not require the interruption of well and reservoir injection / production before and / or during the test because it allows the extraction of an interpretable periodic signal from measured pressure potentially affected by interference. This makes it an ideal monitoring tool. Find out more about HPT in the article.



Did You Know...

... that the Bedretto Lab lies within one of the longest uncovered tunnels in Switzerland?

With a length of 5.2 km, the Bedretto tunnel, home of the Bedretto Rock Laboratory for Geosciences, is one of the longest uncovered tunnels in Europe. The tunnel provides rare insights into what is happening inside

the mountain. For example, it offers the possibility to see where gneiss and granite meet. Between them lies an age difference of 700 million years.
(Source: www.bedrettolab.ethz.ch/about/history/)

Miscellaneous

Official Bedretto inauguration

The new rock laboratory "Bedretto Underground Laboratory for Geoenergies" (Bedretto Lab) was inaugurated on 18 May 2018 in Bedretto, Switzerland. More than 300 visitors seized the opportunity to visit the lab and learn more about geothermal research.
The DESTRESS project in Bedretto aims to demonstrate that the construction of a heat exchanger that is sustainable over several decades can be planned and controlled with the aid of hydraulic stimulation processes. The experiments will be carried out on scales of several hundreds of meters. The larger scale allows more realistic experiments to be carried out, applying different stimulation concepts.

Similar to other projects, in-situ stimulation concepts tests will be conducted while monitoring hydro-seismo-mechanical key parameters at a high spatial resolution. The addressed questions are:

1. Which stimulation concepts are appropriate for enhancing the permeability by orders of magnitudes while minimizing induced seismicity?
2. What are the relationships between the hydro-mechanical response, the stimulation concept, permeability creation, effective porosity, and induced seismicity?
3. How can micro-seismicity be minimized?
4. What are the heat exchanger properties of the reservoir?

Find out more about the Bedretto Lab on their website and follow their Instagram account @BedrettoLab.

7th European Geothermal Workshop

The 7th European Geothermal Workshop in Karlsruhe, Germany, will take place from 9 to 10 October 2019. It aims at discussing new approaches, methods or data in the fields of deep geothermal reservoirs for energy exploitation, with a strong focus on on-going research and proposes a platform of scientific exchange, especially between PhD students and scientists. As a side event, a visit to a geothermal site is planned. Registration is now open until 24 September 2019, papers can be submitted until 26 August 2019. Find more information about the workshop here.

Services

Conferences

02. - 06.09.2019 in Potsdam, Germany
13th EURO-Conference on Rock Physics and Geomechanics - The Guéguen Conference

24. - 25.09.2019 in Brussels, Belgium
European Shallow Geothermal Days

Workshop

09. - 10.10.2019 in Karlsruhe, Germany
7th European Geothermal Workshop

Congresses

05. - 06.03.2020 in Offenburg, Germany
GeoTHERM expo & congress

27.04. - 01.05.2020 in Reykjavik, Iceland
World Geothermal Congress WGC

Website Mail us

DESTRESS
Demonstration of soft stimulation treatments of geothermal reservoirs

DESTRESS demonstrates methods of enhanced geothermal systems (EGS). The aim is to expand knowledge and to provide solutions for a more economical, sustainable and environmentally responsible exploitation of underground heat.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 691728