

EGS Innovation in the Danube Region:

- ✓ *South Hungarian EGS Demonstration Project*
- ✓ *Horizon 2020 Proposal*
- ✓ *Danube Region Geothermal (EGS) Research Park*

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South Hungarian Enhanced Geothermal System (EGS) Demonstration Project (SHEGSDP)



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SHEGSDP – Scope and Objectives

- Enhanced Geothermal System for electrical power and heat production
- Environmentally sound methodology of hydro-shearing
- Demonstrate an innovative new technology for Geothermal Energy harnessing and utilisation
- Focus on opportunities for repeatability in the whole area marked by the Pannonian Basin; compassing the Danube Region
- Facilitates deeper understanding of the bedrock in the Danube Region
- Strengthens local and regional community and social development

Recommended by the Steering Group of the EU Strategy for the Danube Region in December 2012

Status and Path Forward

2014

- Service Contract with AltaRock Energy for Reservoir Creation
- Request of formal relocation from FER to BAT
- Technical Operation Plan and EIA
- 3D Seismic Interpretations
- Horizon 2020 proposal & Geothermal Research Park

... 2015

- Start of Seismic Monitoring
- Start of Reservoir Creation for first well (Hydro-shearing)
- Assessment of initial results
- Well siting of second well

2015 ...

- Legally Binding Instrument, contract with Hungarian Ministry for National Economy
- Governmental Prioritised Project
- Start of Exploration Phase
- Geothermal Concession Contract
- Licensing-, Geoscience-, Procurement Preparations

2016

- Well Siting
- Site Preparations
- Procurement of Seismic Monitoring, Drilling etc.
- Licensing Completion for Drilling activities
- Drilling of first well



Horizon 2020 Proposal: *South Hungarian Enhanced Geothermal System (EGS) Test Programme (SHEGST)*



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Horizon 2020 - SHEGST

- **Objective**
 - **reduce cost of EGS power production** by increasing the performance of near-commercial scale technologies used for the creation of EGS well fields.
 - In line with the expected impact of the call
- **Type of H2020 action: Innovation**
 - An exceptional opportunity for the proposed team in the SHEGST to conduct research, develop technology and then test that technology in the field setting of the SHEGSDP.





A world map with a yellow background and white landmasses. A dashed line connects several locations: Hot Rock Research Organization (North America), Mannvit hf (Iceland), Foulger Consulting Ltd. (UK), Seismik Ltd. (Scandinavia), Mannvit kft (Hungary), EU-FIRE EGS Hungary Ltd. and Budapest University of Technology and Economics (Hungary), and Hanjin D&B (East Asia). A central point in Hungary is highlighted with a yellow dot. The map is framed by a grid with letters A-F at the top and bottom, and numbers 1-4 on the sides.

Hot Rock
Research
Organization

Mannvit hf

Seismik Ltd.

Foulger Consulting Ltd.

Geostress

Mannvit kft

EU-FIRE EGS Hungary Ltd.
Budapest University of
Technology and Economics

Hanjin D&B

Connecting the Danube region

A unique window of opportunity to **connect** the Danube region to an international, state of the art **research cluster** in EGS reservoir creation.

Danube Region Geothermal (EGS) Research Park



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Danube Region's EGS Research Park



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- Platform for innovation and development of EGS technology in Europe
- Location at the SHEGSDP site provides exceptional opportunity for EGS advancement in the Pannonian basin
- Lighthouse project for further EGS development in the Pannonian basin
- Significant synergy potential
- Showcase for increased use of natural resource with multiple revenue streams

Danube Region's EGS Research Park



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- MoU by EU-FIRE EGS Hungary and Technical University Budapest on establishment of EGS Research Park
- In line with the Danube Region Geothermal Concept
- Close cooperation with the Steering Group for the EU's Strategy of the Danube Region
- Contribution to education, sustainable growth, building prosperity – improving quality of life in the Danube Region

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Reservoir Creation by Hydroshearing

- Targets existing natural fractures in the basement in stead of initiating new tensile fractures
- A network of small (1-2 mm) fractures induced by “shear failure”
- Much lower stimulation pressures than during conventional fracturing
- Multi Zone stimulation using biodegradable zonal isolation materials (TZIM)
- No need for chemically based fracturing fluids and proppants; eliminating risk of ground water contamination

