# Feasibility of Enhanced Geothermal Systems in the Precambrian crystalline basement in SW Scania, Sweden

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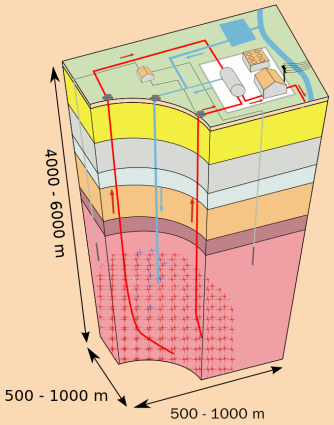
## BACKGROUND & AIM

Sweden are currently on the brink of an urgent energy change. Fossil fuels will be phased out by 2045, nuclear power are steadily heading towards the same verdict and energy demands continues to increase due to electrification. To met future energy demands focus has been placed on EGS (Enhanced Geothermal Systems). The technique can provide both heating and electricity through deep drillings and artifically created fracture systems in a secure, environmental friendly way. The ability to evaluate the geologicall conditions, and therby the EGS-potential at a depth of five to six kilometres in the crystalline bedrock is crucial for the EGS-technology to be utilized in the future.

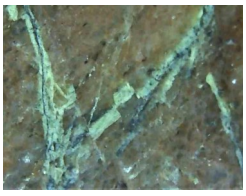
In this study expected geological conditions at great depths in Malmö, southwestern Scania, are being evaluated.

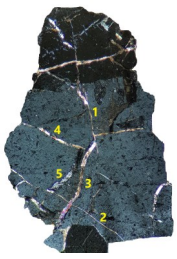



Schematic illustration of an EGS.

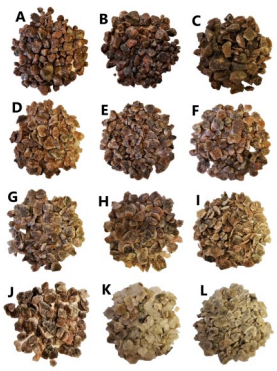
## METHODS

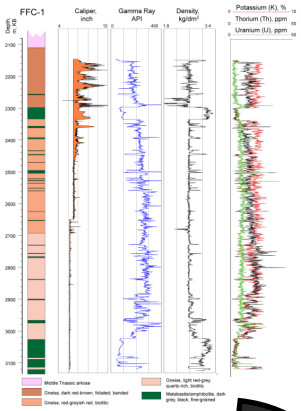
Optical microscopy, SEM-EDS, thermal- and density analyses of cores and outcrrops from Dalby quarry to understand minerology, fractures and chemistry of fracture fillings.






Optical, chemical, density and thermal analysis of cuttings from the 3133 m deep FFC-1 well in Malmö for understanding minerology, chemistry and fracture minerals. Analysis of geophysical log for geophysical rock characteristics.




Results from Dalby quarry and Malmö compared with other regional data, mainly from the 3700m deep DGE-1 well outside Lund and data from SGU´s maps.

## CONCLUSIONS

- The basement rocks in Malmö and Dalby present the same composition, fractures and fracture filling minerals.
- The upper most part of the Malmö bedrock is heavily fractured, giving good indications of micro fractures existing at greater depths beneath Malmö.
- The temperature gradient is relatively high in comparison to central parts of the Fennoscandian Shield.
- The thermal conductivity is relatively high for the gneiss due to it´s high quartz content.
- The EGS-prerequisites in SW Scania are favourable.