High Temperature Energy Storage – HTES project: Geotechnics and Geochemistry section.

This research is part of the EUDP funded project HTES that aims at demonstrating the successful employment of Underground Thermal Energy Storage (UTES) in the subsurface of Copenhagen with a focus on the Chalk Group. The study investigates the geotechnical and petrophysical properties (i.e., stiffness and porosity) of the medium depth (800mbgl) Chalk Group. The majority of the geotechnical data available covers shallow depth, while deep well log data are fewer and of variable quality. In order to overcome the lack of information, this work evaluates the possibility to use Danish field in the central North Sea as an analogue for the chalk in Zealand comparing the effective stress and elastic moduli at the two locations. The maximum experienced effective stress for the formation is the same at the two geographical locations, which currently have different effective stress due to uplift and erosion of Zealand during the Neogene. The results shown were obtained calculating the maximum effective stress based on the burial anomaly as studied by Japsen (1998). In addition, the elastic moduli were calculated using the bulk density and the elastic P-wave velocity log data by means of the iso-frame model proposed by Fabricius (2003). The model allows us to estimate the elastic moduli by comparing the elastic modulus obtained by elastic P-wave measurements with the theoretical one obtained under the assumptions of either particles in suspension or cemented particles constituting a frame.