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Feasibility study on the repurposing of the doublet well at the Groß Schönebeck research platform

Since 2000, the Groß Schönebeck site has served as a multidisciplinary research platform, investigating the extraction of geothermal energy via a ~4.4 km doublet well system. As part of the TRANSGEO project, a study was conducted to explore alternative geothermal development options at the site. The study considered the potential of utilising the existing infrastructure for electricity generation and heating purposes. Although the Rotliegend formation was identified as a potential geothermal reservoir with a temperature of ~150℃, it was found to be insufficiently permeable for commercial-level heat production. The study therefore implemented two new technological approaches: an open-system development scenario involving a fracture-dominated Enhanced Geothermal Systems (EGS) and a closed-system scenario involving a single-well coaxial Deep Borehole Heat Exchanger (DBHE) concepts. The fracture-dominated EGS concept is designed to extract heat from the Rotliegend Formation at a depth of 4.2 km, while the coaxial DBHE concept utilises the highly conductive salt layers of the Zechstein Formation at a depth of 3.8 km. A series of numerical simulations were conducted using the CMG STARS software to assess the optimal energy yield from each well. The study's results are complemented by a discussion of measures that could be implemented to increase the feasibility of the concept, as well as an economic assessment of the investment required for the hypothetical development scenarios versus the potential revenue. In accordance with the local regulatory framework, the study provides a comprehensive overview of the procedural steps of the field development phase, with a particular focus on the two scenarios.

Primary author: CHRISTI, Lingkan Finna (GFZ Potsdam)

Co-authors: Dr NORDEN, Ben (GFZ); Dr BLÖCHER, Guido (GFZ); Prof. ZIMMERMANN, Günter (GFZF (Guest)); Prof. HOFMANN, Hannes (GFZ); Prof. SASS, Ingo (GFZ); Dr FRICK, Maximillian (GFZ); Dr SINGH, Mrityunjay (GFZ)

Presenter: CHRISTI, Lingkan Finna (GFZ Potsdam)