Freitag, 1. März 2024, 11.40 Uhr
Baden Arena Kongress 1 – Tiefe Geothermie

Friday, 1 March 2024, 11.40 am
Baden Arena Congress 1 – Deep Geothermal Energy

Laboratory Testing of Closed Loop Geothermal Systems and Applications for Scaling to District Heating in Germany

Labortests von geothermischen Systemen mit geschlossenem Kreislauf und Anwendungen für die Skalierung auf Fernwärme in Deutschland

Franceso Di Credico, Baker Hughes

Baker Hughes and its Wells2Watts partners have constructed a geothermal test facility to demonstrate advanced closed loop geothermal downhole testing facility in Oklahoma City, OK. The well was drilled to a depth of 400ft with the purpose of testing various equipment, sensors, and production scenarios at relevant subsurface conditions to further research and development in the oil and gas domain. However, the well is currently being reconfigured as a geothermal flow loop under the Wells2Watts partnership to position geothermal energy as a key enabler in the energy transition. The geothermal flow loop will have the ability to accommodate a 9 $^{5}/_{8}$" downhole heated bore for the closed loop system, temperatures up to 450°F, pressures up to 5000 psi, 200 gpm flow rates, and accommodate various working fluids for circulation in the wellbore. A series of experiments will be conducted to test the efficiency of closed loop systems for power generation at relevant subsurface and wellbore conditions of low enthalpy systems. In addition to the laboratory testing, we will present the business case and considerations for a field deployment being considered at an existing well near Celle, Germany for district heating purposes. The scaling of the test well facility in Oklahoma to Baker Hughes' testing site in Germany will enable the ability to understand the feasibility to deploy closed loop geothermal in various locations for district heating networks and using existing wellbores using this technology.

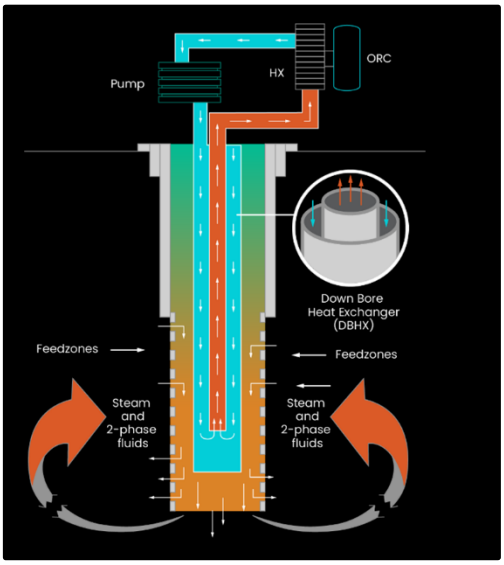

Fig 1 & 2. The image on the left is the co-axial closed loop geothermal system. The image on the right is the laboratory test well that is currently testing this at high temperatures and to analyze well repurposing.