

THE SOULTZ CONCEPT: NEW PERSPECTIVES FOR EXPLOITATION OF GEOTHERMAL ENERGY RESOURCES IN SOUTH AMERICA

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The European Hot-Dry-Rock (HDR) project in Soultz, France, is located at the western flank of the Rhine Graben to explore the use of geothermal resources for producing electric power. The HDR concept is based on creating an artificial underground heat exchanger by hydro-fracturing deep crustal rocks between two or more boreholes. Such a system was realized in Soultz at a depth of 3.0 to 3.5 km by injecting and producing more than 700,000 m³ of fluids from 1993 to 1997, resulting in a vertical slab of stimulated rock with a surface area of 3 km² and a horizontal extension of about 400 m. During a four-month experiment in 1997, more than 240,000 m³ of fluids were injected and produced at flow rates between 20 and 25 l/s. The outflow temperature was 142 °C. The heat exchanger is thus functional. However, there are indications that the hydraulic fracturing also created a connection to the natural fault system, which is part of a flow field across the Rhine Graben (80-100 km). The artificial underground heat exchanger is thus connected to a very large natural reservoir, and the original HDR concept evolved to an Enhanced Geothermal System (EGS). This 'Soultz-Concept' for energy production can be transferred to any location with large-scale fault systems, e.g. rift systems associated with opening of the Atlantic (Potiguar, Barreirinhas and Tacutu in Brazil and Bransfield in the Antarctic), and areas of large scale deformation in the northern parts of the continent (El Pilar-Casanay, Venezuela).