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GeoTHERM expo & congress

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GeoCoGen Eclépens: Geothermal Prospection in Western Switzerland

Geothermische Untersuchung in der Westschweiz

Rodolphe Lathion, Swiss Geo Energy SA

The GeoCoGen Eclépens project is a unique combined geothermal energy development offering a large replication potential in Switzerland. At the heart of the Swiss Confederation's 2050 energy strategy, this project is located in Western Switzerland, north of the city of Lausanne, capital of the canton of Vaud. A deep well drilled in 1981 searching for hydrocarbons, discovered a geothermal anomaly with excellent potential to deliver heat production well beyond the technical threshold required for power generation and heat distribution from some 4’000 m depth below surface. Due to intense natural fracture density such production can be achieved without fracturing technology and hence, virtually without induced seismicity.

The main objectives of the initial prospecting phase are to provide the best possible three-dimensional representation (imagery) of the subsurface structures between 500 and more than 4'000 m under the topographic surface. We aim to provide the necessary information to make a first estimate of the geothermal resource and to identify potential targets and define most suitable well paths designs. To do this, we articulate the subsurface exploration around a 3D seismic acquisition campaign, associated with a seismological risk assessment study. This will allow us to build a reliable 3D geological model and to validate the favourable premises. We will identify and characterize the potential aquifer zones ("geothermal reservoirs") and the possible seismogenic structures that should be avoided during drilling operations. The seismic acquisition campaign will be essential to test the working hypothesis and to characterize the different sedimentary levels as well as the discontinuities crossing them. Due attention will be devoted on applying innovative and cost-effective methods with minimum impact on the environment and the population. They encompass multi-level optimized seismic acquisition design as well as latest processing and interpretation techniques that will allow the best usage of the acquired data. In case of success, the latest monitoring technologies will be used to detect any vital signs of the geothermal system without increasing the project costs drastically (light seismic monitoring). With these essential bases, it will be possible to formulate precise hypotheses on the underground circulations and to define the most promising sectors and design a potential exploration well.