FINAL RESERVOIR GEOLOGY AND GEOPHYSICS MASTER PROJECT

Assesment of geothermal resources in Catalonia: application of the USGS volumetric “Heat in Place” method and Monte Carlo simulations

ABSTRACT

Due to the negative social perspective associated with CO_2 emissions and reservoirs depletion, during the last years is increased the interest of development renewable energies (wind, solar, wave power or heat sources...). In the present work is going to be carried out a low-enthalpy geothermal potential assessment of two Catalan Neogene basins: Reus-Valls and Penedès which are considered an analogue of the geothermal field placed in the Paris basin where already many wells have been drilled.

There are many assessment methods but between all of them, the USGS Heat in Place method, is the most accepted and used method by scientific community and therefore the one that is used in the development of this work. This method is combined with Monte Carlo simulations which are a stochastic approach frequently used by oil and gas companies to manage the risk associated to the lack of data and reservoir characterization uncertainties that take place during early stages of exploration in geothermal fields.

In this study will be use two different ways to analyze the potential geothermal resource. The first one approach consists on the evaluation of some areas considered the most suitable from a geothermal energy point of view. As the correct definition of areas and many parameters like depth or thickness is quite a difficult task a second approach was carried out to do geothermal assessment using the seismic lines. In this approach, the area is fixed in $4km^2$ and thickness and depth are calculated from the seismic line. Finally, some scenarios varying different uncertainties were defined to study the influence of its variations in the results.

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