Assessment of Geothermal Energy Potential from Low Enthalpy Fluid at Rural Areas in El Salvador by Using Open-Source Programming Language

*CARLOS OSMIN POCASANGRE[1], Yasuhiro Fujimitsu[1]

1. Kyushu Univ.

The geothermal resource assessment is the estimation of the amount of thermal energy that can be transformed from a geothermal reservoir and used economically by people as different kinds of applications. When a geothermal exploration starts, sometimes the provided data are either limited or missing. Therefore, in this study case, a simple technique called the volumetric method is used. The main purpose of this study is the use of the volumetric method to estimate ability to produce electrical energy from low enthalpy fluid in the northern part of El Salvador where there are hydrothermal manifestations or hot springs and the people who live there can use as an electrical source. The calculation of the geothermal energy stored in a volume is based on the range of reservoir parameters and carried out by using the stochastic Monte Carlo simulation. There are some kinds of licensed software for carrying out this task. However, for this case, the algorithm has been programmed by using Open-Source Programming Language, i.e. Python v2.7 and PyQt4. As an example, a theoretical conceptual model of a hot spring area located in the Municipality of Nombre de Jesús was chosen. After running the algorithm, it shows that the field could initially support a 16.1MWe power plant for 25 years and a possible expansion to 19.8MWe. However, it will be subject to further investigations for obtaining and validating the new data.

Keywords: El Salvador, low-enthalpy fluid, volumetric method, Open-Source Programming Language, Monte Carlo simulation