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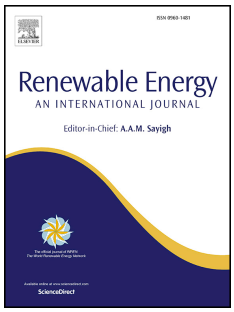

Life cycle analysis of geothermal energy for power and transportation: A stochastic approach

O. Hanbury, V.R. Vasquez

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Life Cycle Analysis of Geothermal Energy for Power and Transportation: A Stochastic Approach

O. Hanbury, V.R. Vasquez*

Chemical and Materials Engineering Department
University of Nevada, Reno, Reno, NV 89557

Abstract

Increasing awareness of environmental issues surrounding power generation and transportation has increased interest in renewable energy sources such as geothermal. Renewable energy extraction is not without environmental cost, however; drilling operations and construction of the facilities required for utilization can be resource intensive. Complete life cycle analysis (LCA) allows for impact comparison between competing methods of power generation. The results are modular, allowing for use in other product life cycles. One such life cycle is that of the transportation vehicle. An analysis of vehicle life cycles involving geothermal energy is performed employing the The Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation (GREET) model. Geothermal power has large variations between plants owing to differences in the hydrothermal reservoir chemistry and thermodynamic conditions. Due to these variations, a stochastic approach was used to determine the amount of variation that is likely to be seen using this energy source. The results show geothermal power to have low environmental impact relative to other methods of energy production for use in transportation.

Keywords: LCA, environmental, energy, impacts, Monte-Carlo, simulation, geothermal

Abbreviations

- LCA: Life Cycle Analysis

*Corresponding author: victor.vasquez@unr.edu