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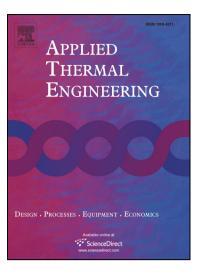
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ACCEPTED MANUSCRIPT

Sustainability evaluation model of geothermal resources in

abandoned coal mine

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**ABSTRACT:** The evaluation of geothermal resource is important for abandoned coal mine

reservoir. In this paper, we assessed the geothermal potential of abandoned coal mines using

numerical model with key parameters calculated by empirical formula. The volume and spatial

distribution of fractures were calculated based on the volume of open space in the abandon mine

and strength of roof rock; a 3D model was developed using the MINC method of TOUGH2

simulator. Calculation results show that the geothermal potential of abandoned mine reservoirs

depends on not only the permeability of fracture but also the height of fractured zone. Because of

the height of fractured zone, the abandoned mine with the strong roof has more geothermal

potential than in other cases. Furthermore, sensitivity analyses of key parameters model results

indicated that the heat extraction rate is closely related to not only the flow rate but also the

injection temperature and lifetime.

**Keywords:** Geothermal energy; Abandoned mine; Stope; Sustainability

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