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A GIS-based method for analysis of a better utilization of thermal-mineral springs in the municipality of Kursumlija (Serbia)

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ABSTRACT

There are about 240 geothermal occurrences with 60 commercial spas included in, which are spread throughout the territory of Serbia. The majority of springs and other surface manifestations are located along the south-eastern edge of the country. Three spas Lukovska, Prolom and Kursumlijska are with the highest geothermal potential and balneology utilization. They are situated in the vicinity of Kursumlija, one of the largest municipalities in Serbia, but with poor economic development. Although the presence of these three spas and more than 23 thermal mineral springs with the temperature of water between 26.4° and 68 °C reveal it among the great geothermal resources in Serbia, the extent and potential of these resources are poorly understood. The estimated capacity of geothermal energy in three spas and 20 springs is 620.36 (TJ/year) or 19.6 MWt. In spite of a vast quantity of this clean, renewable energy resource only a small percentage of it is used in balneology and extremely rarely for greenhouse heating. In Serbia the kind of energy mostly used belongs to dirty energy resources, such as timber, coal, oil, gas, natural gas, etc. The use of geothermal renewable energy for the heating of public institutions is highly recommendable and agrees with today's growing awareness of the environment protection and improvement of the quality of life. The additional use of it for heating in householders would reduce the import of natural gas and oil and would support the municipality and its inhabitants to escape from poverty.

Abbreviation: ThM, Thermal-mineral spring; SMM, Serbo-Macedonian Massif; KBR, Kopaonik block and ridge; QGIS, Quantum Geographical Information System; SAGA, Extension of Spatial Analyst

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