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## RENEWABLE ENERGY – A SUSTAINABLE AND CLEANER RESOURCE. CASE STUDY FOR ROMANIA

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### Abstract

Whereas the energy sector is, currently, mainly described as a vertically monopolistic structure, one may expect that during the course of this century it will rapidly shift towards a decentralized system that appears to be more efficient and cleaner. In this context, the third millennium exhibits as new challenges for our civilization and its mentality: the adaptation and implementation of technologies such as high-performance gas turbines, wind turbines, solar photovoltaic panels and solar thermal collectors, capture of geothermal energy etc. Although the share of energy produced by these sectors is still relatively small, possibilities exist for the extensive implementation of such type of energy sources; this would result in a less expensive and more decentralized energy system, particularly in Romania, as is demonstrated in this work, on the basis of a case-study.

This paper is aimed at assessing the possibility to produce hot water in a household located in a city in the North West of Romania by using the solar energy captured through solar thermal collectors. The necessary collector area per person and the corresponding values of the unit thermal load per m<sup>2</sup> have been calculated on the basis of measurements carried-out on solar collectors placed on houses from Zalau city. The calculated values have been extrapolated for the whole area (67512 households). The results were converted in carbon dioxide which is considered the main responsible for greenhouse effect. From this study case, one may conclude that during 2007- 2010, which is the period when this study was conducted, the hot water production using solar panels led to a decrease of CO<sub>2</sub> emissions by 8.92 kg/house.

Replacement of fuel based technologies would have a beneficial impact on the energy situation, since alternative energies (especially solar energy) are available throughout the whole country. This fact provides the perspective for an optimistic and constructive approach that allows everyone to contribute, by direct and/or indirect actions, to the limitation of adverse global phenomena or even to the elimination of polluting activities that are harmful to humans and to the environment.

*Key words:* alternative energy, renewable energy, solar collectors, thermal load

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