



**"Gheorghe Asachi" Technical University of Iasi, Romania**



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## ENERGETIC AUTONOMY FOR A SOLAR HOUSE

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### Abstract

Energy mix used in "Solar House" is currently composed of about 50% renewable energy sources (geothermal energy) and 50% conventional sources of energy (mainly electricity from national grid and less than 10% natural gas). The geothermal energy is extracted by the mean of a ground coupled heat pump which assures the heating load of the "Solar House" and the preparation of domestic hot water. The peak load in heating period is covered by a natural gas boiler and the electricity to drive the heat pump and for the lighting system of the "Solar House" is taken from the national grid. Energetic autonomy of the "Solar House" and the Nearly Zero Energy Status can be achieved if a significant part of the conventional energy currently used is replaced with non-conventional sources of energy from renewable sources. The analyzed solution for achieving this objective is a system for converting solar energy into electricity with strings of photovoltaic (PV) modules. The optimum surface of PV modules is calculated, balanced with the complexity of the tracking system mechanisms, and the ratio between the energy produced on site and the energy demand will complete the improved Energy Performance of the Solar House with the Nearly Zero Energy Status.

*Key words:* energetic autonomy, energy performance, Nearly Zero Energy Building, Solar House, strings of photovoltaic modules

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