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Evaluation of Energy Upgrade Measures and Connection of Renewable Energy Sources Using Software Tools: Case Study of an Academic Library Building in Larissa, Greece

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Abstract : Increased energy consumption in the academic buildings, creates the need to implement energy saving measures and to take advantage of the renewable energy sources to cover the electrical needs of those buildings. An Academic Library will be used as a case study. With the aid of RETScreen software that takes into account the energy consumptions and characteristics of the Library Building, it is proved that measures such as the replacement of fluorescent lights with led lights, the installation of outdoor shading, the replacement of the openings and Building Management System installation, provide a high level of energy savings. Moreover, given the available space of the building and the climatic data, the installation of a photovoltaic system of 100 kW can also cover a serious amount of the building energy consumption, unlike a wind system that seems uncompromising. Lastly, HOMER software is used to compare the use of a photovoltaic system against a wind system in order to verify the results that came up from the RETScreen software concerning the renewable energy sources.

Keywords : building sector, energy saving measures, energy upgrading, homer software, renewable energy sources, RETScreen software
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