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Grid connected PV System design and Feasibility Study for the Electrical and Electronics Engineering Department of University of Tripoli Using PV*SOL Software

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ABSTRACT

The solar energy is considered one of the most important renewable energy resources and the most pure and friendly to the environment. The world is gradually moving towards sustainable renewable energy sources due to diminishing fossil fuel energy resources and increasing demand for power. The electricity supply in Libya is instable, especially in the capital and other large cities. Users such as residential, commercial and universities are looking for alternative sources to deliver adequate standards of electricity. The photovoltaic technique is constantly developing in many ways as it generates electricity without risks or extra costs. There is significant potential for the use of the photovoltaic solar energy in countries like Libya which receive abundant amounts of solar radiation around the year. In this paper the measurements have been taken to the drawing current for each phase during 24 hours for 15 days and recording the average of each result, the power consumption of the building have been calculated for several months considering that consumption during this period is mostly constant. A solar PV system was designed for the electrical & electronic engineering department building and its performance has been simulated using PV*SOL software. Critical parameters such as Power at maximum power point and capacity factor have been calculated for the designed PV system. Financial Analysis was then conducted to check the economic feasibility of the proposed solar PV systems. Environmental impact has also been studied. The simulation results and analysis of the system are presented in the paper.

Keywords. Renewable Energy, Photovoltaic technique, Power at maximum power point,