

Optimal Design and Simulation of a Grid-Connected Photovoltaic (PV) Power System for an Electrical Department in University of Tripoli, Libya

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Abstract : This paper presents the optimal design and simulation of a grid-connected Photovoltaic (PV) system to supply electric power to meet the energy demand by Electrical Department in University of Tripoli Libya. Solar radiation is the key factor determining electricity produced by photovoltaic (PV) systems. This paper is designed to develop a novel method to calculate the solar photovoltaic generation capacity on the basis of Mean Global Solar Radiation data available for Tripoli Libya and finally develop a system design of possible plant capacity for the available roof area. MatLab/Simulink Programming tools and monthly average solar radiation data are used for this design and simulation. The specifications of equipments are provided based on the availability of the components in the market. Simulation results and analyses are presented to validate the proposed system configuration.

Keywords : photovoltaic (PV), grid, Simulink, solar energy, power plant, solar irradiation

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