

TITLE: Photovoltaic (PV) Technology and Its Application for Campus Lighting

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Fossil fuels have been the main energy source for decades. With the increase of crude oil and the decrease in the projection of oil that is stored in the subsurface of the earth, mankind's future for energy must incorporate adoption of renewable energy resources. Since Einstein's discovery of the photoelectric effect it was possible to produce electricity using silicon based semi conductors.

This project is a study of semiconductor devices that convert incident solar radiation directly into electricity and an analysis of the electrical characteristics of PV module. Emphasis was placed on the evaluation of the load power needed, the size of the panel and the location of the final PV lighting system. The PV system that was constructed consists of an 8ft x 3ft module, two 12V lead acid batteries, one low pressure sodium lamp and a charge controller. The lamp and module were fitted on a 10 ft steel pole and the batteries and controller placed into an insulated, water proof 20"x20"x20"metallic box positioned directly below.

With the PV lighting system installed, its performance was tested over a period of a few days. By varying resistances, corresponding values of current and voltage were recorded. The incident irradiance and ambient temperature were also measured. The system's performance was deemed satisfactory since it was able to illuminate the required area from dusk to dawn.