THE CPU GREEN INITIATIVE: DESIGN OF SOLAR PV SYSTEMS FOR STREETLIGHT AND GRANDSTAND LIGHTING

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ABSTRACT

This study provides a design of a solar PV system with grid power backup to supply the streetlights around the CPU Football Field and grandstand lightings. To start a green initiative for CPU and to reduce the energy cost for operating the CPU streetlights and grandstand lightings, the CPU Green Initiative Design of Solar PV Systems for streetlight and grandstand lighting was developed. The design utilizes the grandstand roof surface for the location of the solar panels and makes use of the existing streetlights wiring connections. The design employs 27 PV panels, 200 ampere hours, 12-volt battery bank, 12.64-ampere solar charge controller rating, and a 12-volt inverter rating. The results of the voltage drops of the system in the design is also below 5%. It is expected to have a return of investments in 10 years. The solar energy harvested by the panels is stored in storage banks which are placed in a room beside the grandstand. A hybrid charge controller with priority is used to automatically change the supply be it from the grid, the battery, or directly from the solar panels. The design is able to provide energy for the streetlights around the CPU football field and CPU grandstand lightings for a maximum of one day in case of loss of supply from the grid.