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Smart Street Lamp Design and Application with PV Panel and Grid Integration

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Abstract

Energy, approximately %80 part is supplied from fossil fuels, has a strategic importance for countries. Also, it is one of the most critical parameters determining the development levels, international relations and quality of life of the countries. Our country is highly dependent on foreign countries in terms of energy and this dependency causes economic and political risks. In this respect, it is important to use efficiently produced energy, to manage renewable energy sources and to reduce energy consuming for our country. Studies on smart and LED lighting subjects have increased in the lighting systems which is one of the areas where solar energy is highly preferred. In this study, an intelligent street lighting system is designed and energized by PV integrated grid. In the realized system, the energy obtained from the sun through the PV panel is stored in battery during the day and used for system lately. The light intensity of the LED street lamp varies dependşng on vehicle or pedestrian traffic. In addition, if the energy stored in the battery falls below the specified level, energy demand of the system is supplied by grid uninterruptedly. Designed system is controlled via Arduino card and the required software and hardware devices are designed succesfully.

Keywords: *Smart Street Lamp, Solar energy, high power LED, energy efficiency, Arduino*