

DESIGN AND CONSTRUCTION OF AN AUTOMATIC PUBLIC STREET LIGHTING SYSTEM USING RESOURCES FROM OFF-GRID SOLAR PANELS (Case study at Taman Beach)

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ABSTRACT

Public Street Lighting (PJU) is important infrastructure to provide safety and comfort for road users at night. The use of solar energy as a power source for PJU has become a promising alternative because of its environmentally friendly and renewable nature. However, the use of solar energy in solar power plants (PLTS) still has limitations, in that solar panels cannot capture maximum light because they are static and do not follow the movement of the sun. This research aims to design and build an Internet of Things (IoT)-based PJU monitoring and control system that can overcome these limitations. With this system, solar energy can be converted into direct current voltage electrical energy, which is then converted into alternating current voltage for lighting street lights. Sunlight sensors are used to regulate when the PJU lights will turn on, so that during the day, the lights do not need to operate, saving electricity usage. The use of LDR (Light Dependent Resistor) and PIR (Passive Infrared Sensor) sensors as light controllers provides flexibility in this system, where the lights are not only tied to day or night conditions, but can also adapt to overcast or cloudy conditions. In addition, the current reading on the system provides an indication of the condition of the lamp, whether it is damaged or healthy. The system test results show that the maximum sunlight value was detected at 10.00, while the darkest night conditions were detected at 23.49. The current sensor provides reading results with an average error rate of 0.02%, and the PIR sensor can detect objects with a maximum distance of 5 cm. Testing of the entire system achieved a 100% success rate.

Keywords: *PJU, IoT, LDR, PIR.*