

ABSTRACT

Indonesia is actively pursuing the energy transition from fossil fuels to renewable energy as part of its global commitment to reducing greenhouse gas emissions and achieving the Net Zero Emissions (NZE) target by 2060 or sooner. The increasing demand for electricity in Indonesia, coupled with the decline in fossil energy reserves, drives the development of renewable energy sources such as Solar Power Plants (PLTS). This research aims to design a security system for a 10 MW Solar Power Plant in Tobelo, North Maluku, utilizing electric shock technology and IoT integration. The research methodology includes literature review, simulations using PVsyst, and the development of an IoT-based security system prototype. Tobelo has high annual irradiation potential, ranging from 1,600-2,000 kWh/m², making it a strategic location for PLTS development. The designed security system includes PIR sensors, electric shock effects, and cameras for automatically capturing images of perpetrators triggered by the opening of bolts. Prototype testing showed the system's effectiveness in preventing theft.

Kata Kunci: Keywords: PLTS, Tobelo, renewable energy, security system, electric shock effects, IoT.