

Photovoltaic for Isolated Office System (PIOS) based on Single-User Mini-Grid at Energy Park, SERT, Thailand

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Abstract

This paper applied the concept of single-user mini-grid to design the electrical power system that is used for isolated offices in remote areas, which have no electricity. This electrical power system will be called “Photovoltaic for Isolated Office System” or “PIOS”. The designed system will supply the loads at the daytime directly with energy generated from the solar radiation and the surplus energy will stored in the battery. At night the system can deliver the energy stored in the battery. In this system 2 inverters will be applied, the first inverter will be used to convert DC current from the array to AC current and pass directly to load in the daytime, and the second inverter will be used to convert the DC current from the battery to AC load at night. And in the case of solar radiation being insufficient, the load management model will be used for the stability and reliability of the system. The system sizing is 10 kWp that will be installed and data collected at the Testing Building, Energy Park, Naresuan University, Thailand. The expected results are the photovoltaic for isolated office system model and a load management model which can be applied and used in similar scale sizes of isolated offices in remote areas.

Keywords: Photovoltaic for Isolated Office System (PIOS), Load management model.