

**SIZING OF STANDALONE PV POWER SYSTEM FOR
TELECOMMUNICATION**

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ABSTRACT

This thesis present the method for determining the Sizing of Standalone Photovoltaic (PV) Power System in term of sizing of PV array and battery storage for School net-VSAT and Public Phone usage. The system is specifically designed to cover the power necessities of remote, isolated telecommunications facilities, and should be able to work for at least 5 years. In finding the optimal sizing of standalone PV power system, data consumption for each type of service is considered. As of other standalone PV power system, this project will generate electric power by using solar cell where the energy from the sun is converted into a flow of electrons. In ensuring the validity of the proposed method, the existing standalone PV power system is selected as a reference. The proposed method gives very close values to existing standalone PV power system. However the proposed method is better than existing one because of its simplicity and wide availability.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

Based on the fact that PV systems are clean, environmentally friendly and secure energy sources, PV system installation has played an important role worldwide in providing alternative power source. However, the drawback of PV system is the high capital cost compared with conventional energy sources. Currently, many research works are carried out focusing on optimization of PV systems so that the number of PV modules, capacity of storage battery, capacity of inverter and PV array tilt angle can be optimally selected. PV system size and performance strongly dependent on metrological variables such as solar energy and ambient temperature. Therefore, to optimize a PV system, extensive studies related to the metrological variables have to be done [1].

The research works related to PV system size optimization can be found in [2-10]. In [2], the probabilistic approach is used to optimize PV systems by considering a probability function which is expressed as the probability of losing load in terms of storage battery, PV array energy output and load demand. Therefore, the determination of storage battery is done based on the reliability of the PV system and the PV system array size is calculated using the worst monthly method. However, to optimize the array and storage sizes, it is assumed that the stored energy in a storage battery is equal to the difference between the load power and PV array generated power. To avoid any load interruption, the PV array size is designed based on the worst monthly average of solar energy. As for