



**DEVELOPMENT OF STAND-ALONE HYBRID PHOTOVOLTAIC SYSTEM FOR
METROLOGY LABORATORY IN LAUTECH SOUTHWEST NIGERIA**

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DEVELOPMENT OF STAND-ALONE HYBRID PHOTOVOLTAIC SYSTEM FOR METROLOGY LABORATORY IN LAUTECH SOUTHWEST NIGERIA

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ABSTRACT

The photovoltaic power system uses the direct conversion of solar irradiance into electricity, can be used as an electrical power source for a home and farm settlement to meet its daily energy requirement. This work presents the design, installation, and testing of a hybrid standalone photovoltaic power system. The process of securing photovoltaic power involves designing, selecting, and determining specifications of different parts that are used to conform to the load estimation of 940 watts. The designed system consists of a 150 watts PV with a battery of 12 V, 100 Ah, and a 1.0 kAV inverter. The designed PV stand-alone power system was tested to study the relationship between the potential difference and the temperature distribution using extended heat transfer equipment. The set-up comprises of PV stand-alone solar power inverter system, extended heat transfer device, and 12 channel temperature recorder to measure temperature distribution along the length of the metallic rod, Aluminum. It was deduced that voltage has a direct relationship with the temperature distribution using extended heat transfer equipment. The result reveals that the developed system powered 940 watts daily energy demand satisfactorily, and efficient utilization of renewable energy will enhance energy supply in the country.



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