

# **DESIGN AND CONSTRUCTION OF SOLAR POWER PLANT AND WIND TURBINE WITH HYBRID SYSTEM AS AN ALTERNATIVE ENERGY PROVIDER AT CHARGING STATION**

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## **ABSTRACT**

*The need for sustainable electrical energy encourages exploration of alternative energy sources. This research examines solar power plants and wind turbines with a hybrid system as a potential solution for energy sustainability. Experimental methods are used to design and test systems involving solar panels, wind turbines and integrated controls. Voltage and current measurements are carried out on both energy sources over a certain period of time. The test results show fluctuations in the solar panel voltage throughout the day, with a peak of 22.01 V and a low of 17.88 V. The wind turbine voltage ranges from 1 to 12 V depending on wind speed. Despite voltage variations, the output voltage of the buck converter and buck-boost converter is stable at 13.1 - 13.2 V and 13.00 V. This research confirms the ability of the hybrid system to generate and regulate electrical energy from alternative sources. Effective output voltage control despite input voltage variations shows the system's potential in supporting energy sustainability.*

**Keywords:** *Power Generation, Solar Power, Wind Turbine, Hybrid System, Measurement.*