

ABSTRACT

DESIGN OF CHARGE AND DISCHARGE BATTERY SYSTEM FOR HYBRID POWER PLANT

In Solar Power Plant, the electricity generated comes from sunlight energy. However, Solar Power Plant has disadvantage that is when the night time or even rainy season, Solar Power Plant will hardly generate electricity. Because of that another power plant which can be back up power source is needed. PLN electricity is power source that is easy to get and generally used by Indonesian people. Therefore it could be combined with Solar Power Plant to work as a Hybrid Power Plant.

Solar Power Plant generated DC electricity which is direct current. DC electricity that is generated by Solar Power Plant cannot be used instantly due to its instability. Therefore, a circuit that can stabilize generated electricity is needed. A stable electricity then will be stored in battery so it can be use whenever needed. To keep battery power last long when load is fluctuating, battery will also supplied by PLN electricity. PLN electricity is an AC electricity which is alternating current. Therefore, a circuit that can convert AC electricity to DC electricity is needed so it can charge the battery. Beside to contain power generated by Solar Power Plant and PLN, battery will also work to supply the loads in parallel with Solar Power Plant and PLN electricity so load needs will always be fulfilled.

In this final project, a hybrid power plant that can always supply DC electricity to DC loads whenever it is needed is designed. Analysis will be focused on incoming and outcoming power in battery. Incoming power comes from solar panel and PLN while outcoming power will be distributed to DC load. Current sensor and voltage sensor is used to monitor incoming power and outcoming power in battery. In this final project, battery power that could last long when load is fluctuating is expected.

Based on the testing process that has been done, with voltage sensor that has 98.4% average accuracy and current sensor that has 1.78% average error, about 4.45 Watt charging power value from solar panel is obtained with input current value about 0.37 Ampere. Load power total tested is 13.68 Watt. And based on the test, the hybrid system that has been designed can be said work properly.

Keyword : Hybrid, Battery, AC, DC, Fluctuation, Sensor