

## ABSTRACT

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*In the effort to monitor the maturity of tea leaves through color, sufficient energy is needed to meet the energy needs of each device used and each stage of the monitoring process. Monitoring tea leaves is a common method used to determine the maturity level of tea leaves. The energy produced by solar panels which is then stored in batteries must be able to meet the energy needs required in the tea leaf monitoring process. However, there are several problems that can occur in monitoring the maturity of tea leaves through color. One of the problems that arise is the availability of energy that must be available during the monitoring process. If the energy output from the battery is insufficient during the monitoring process, the tea leaf monitoring process will be disrupted and stopped. The use of batteries in energy storage aims to be an energy source in a large plantation area, energy storage in batteries must be able to meet the energy needs of the tea leaf monitoring system. The performance of solar panels shows that solar panels can produce an average power of 7 W and a current of 0.34 A at temperatures above 25 degrees Celsius from morning to evening. The use of batteries as energy backup can overcome the lack of energy produced by solar panels. Two solar panels can activate the tea leaf monitoring system for 3 hours in the morning with an energy requirement of 52.2 Wh under stable conditions.*

**Keywords—** *Battery, Energi Alternatif, Monocrystalline, Output Power, Solar Panel*