

**Sustainable Poultry Farming: Design, Construction, and Testing of a
Hybrid (Solar, Grid, Battery)-powered Egg Incubator**

Project Study Report

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The Faculty of the Department of the Electrical Engineering

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Bachelor of Science in Electrical Engineering

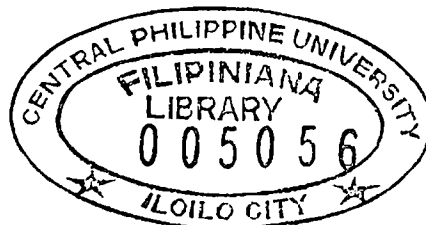
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ABSTRACT

Poultry farming is one of the main components of the chain of supply of livestock that feeds a nation. As the demand continues to increase with the increase in population, poultry farming has been relying on artificial production of poultry supply such is true in terms of the incubation process. However commercialized incubator often run on purely grid power for its operation. The dependence on the local energy supply results in additional cost in production as well as a decrease in productivity whenever power outages occur. Thus, this study aimed to design, construct and test a hybrid powered egg incubator to help lessen the cost of production of poultry farming while utilizing the energy from the sun, a renewable energy and incorporating a battery to supply power in case of power outages increasing reliability and decreasing cost. The conduct of the study was implemented, and the device was successfully fabricated, tested and analyzed. Based on the gathered result, the hybrid powered egg incubator was able to perform as intended with a high percentage on the hatching rate of the incubator, which proves that the design made is capable of hatching eggs. Because the primary focus of this study was to lessen the cost of production as well as increase productivity due to losses of potential hatchlings during power interruption, the energy consumption of the device was monitored and it showed that the implementation of the hybrid energy system on the egg incubator was able to save as much as 50 percent of the energy

utilized on the incubation and hatching process of the incubator. This in turn would result in the cost of energy consumption of the incubation process to be cut by half and would also affect the total cost it needs to hatch a batch of chickens artificially.