

## **ABSTRACT**

*Solar panel as a type of renewable energy in the future will increasingly have an important role as a substitute for fossil energy or nonrenewable energy. However, in its application in the conventional solar panel has shortcomings that is low efficiency, this is because the V-I characteristic of solar cells that are not linear with respect to loading. There are several factors that affect the electric power generated by solar panel, such as the level of light intensity and working temperature of solar panel. In general, there is a unique point on the V-I curve or V-P curve, called Maximum Power Point (MPP). Where at that point, solar cells work at maximum efficiency and produce the greatest output power. The location of the MPP is unknown, but can be searched, using calculation or tracking algorithm. Therefore, the Maximum Power Point Tracker (MPPT) algorithm is required to maintain the working point of solar cells in order to keep working at the point MPP.*

*In this final project will be designed a tool that based from microcontroller to optimize the power of solar panel by finding the MPP (Maximum Power Point) using Incremental Conductance algorithm, then implement them into a voltage output from the solar panel and becomes the input for the boost converter that controlled by PWM (Pulse Width Modulation), so as to produce a maximum voltage and becomes the input to the inverter.*

*This final project expected to create a water pump that does not require a PLN power source. The system implemented in this final project is expected to be used in a variety of conditions. Especially in an area where there is no power source. Because for people, water is a very important requirement.*

**Keywords:** *Solar Panel, MPPT, Incremental Conductance, Boost Converter*