

## **ABSTRACT**

*Nowadays most of power plants in the world are using fossil fuels such as petroleum, coal, and natural gas. That fossil fuels are predicted to be exhausted in 2050. It will lead to lack of electric power source. The lack of electric power source makes consumers have to conserve electricity usage due to its price will be more expensive. But conserving electricity usage is hard to do because the number of people is increasing and they use technologies that are developing too. That technologies use device that need a lot of electric power source such as electronic device.*

*This final project will make “Design and Implementation of Converter for Hybrid Solar Panel and Wind Power Supply for Alternating Current”. In this project design, solar power plant and wind power plant are used as new electric power source. DC voltage will be produced by solar power plant, while AC voltage will be produced by wind power plant. AC voltage from wind turbine will be rectified to be DC voltage with three phase bridge rectifier circuit. DC voltage from solar power plant and rectified AC voltage from wind power plant will be stored in battery or accumulator. Before stored in battery or accumulator, DC voltage from solar power plant and wind power plant is controlled by BCU with Synchronous Buck Converter method. DC Voltage which is stored in battery or accumulator goes to inverter full bridge circuit to generate AC Voltage. And that will be distributed to load.*

*From BCU test results in solar panel and wind turbine, we know that this system has BCU efficiency about 81,16-95,41% in solar panel and power BCU about 59,9-94,41% in wind turbine with accumulator charging condition 12V/100Ah. Besides, BCU works on maximum input voltage 65,8V<sub>DC</sub> and output voltage  $\pm 13,8V$  with maximum current that goes to accumulator 12V/100Ah is about 6,76A. From inverter circuit test result we know that lowest efficiency is about 68,21% on 15 watt lamp as load and highest efficiency is about 98,47% on 3,7V<sub>DC</sub>/2000mAH Lenovo smartphone battery as load.*

*Keyword: Solar Panel, Wind Turbine, Battery, Inverter, BCU*