**ABSTRACK** 

In the Ministerial Regulation of the Ministry of Energy and Mineral

Resources number 49/2018 article 6 paragraph 1 which reads "The electricity for

the customers of PLTS Roof for export is calculated based on the export-import

kWh value stated on the export-import kWh meter multiplied by 65% (sixty five

percent). This means that PLTS electricity sold to PLN is valued at 65% of the

prevailing electricity fare. The voltage generated by PLN is alternating voltage

(AC) while the solar panel produces direct voltage (DC), so a tool is needed to

convert DC voltage into AC voltage, namely an inverter.

When combining two different sources the inverter and the PLN network, it

requires a control system, namely a grid connected. The preparation of this final

project is carried out to synchronize the singlephase power source (inverter) with

other single phase electricity sources (PLN). The main system of this design is an

inverter, where the inverter will convert DC voltage into AC voltage. The

synchronization process requires the same frequency and phase to be adjusted

between the two sources. The author performs the Zero Crossing technique which

is a technique for determining the zero point of a single-phase power source, namely

PLN. This zeropoint will trigger the microcontroller PWM and the formation of

SPWM for inverter switching.

In this final project, testing the efficiency of the inverter when conditions

are on grid by taking data at the same point in bear times. The results of this test

obtained an average inverter efficiency of 96.24% and the power transfer test can

only send power at an angle difference of less than 10.8 with a maximum power of

25.7Watts provided that the inverter is leading to PLN and the amplitude of the

PLN and the inverter must be the same.

Keywords: Inverter, on grid, PLN, efficiency, zero crossing

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