ABSTRACT

The need for electricity is a major need in today's life. Where the daily activities of people, both young and old, are very dependent on electricity. Electric is the final product of a power plant, which will then be distributed from the generator to the load/customer through transmission and distribution lines of electricity. A distribution of electric power can be said to be well distributed from the amount of power received by the customer/consumer. In general, the location of the power plant that is far from community settlements will affect the quality of power received by the customer/consumer. In other words, the farther the distance from the generator, the greater the power losses and voltage drops, this is caused by the process of sending power through the transmission and distribution network where power losses and voltage drops occur.

With increased knowledge, this problem can be solved with the help of Distributed Generation (DG) installations in the power grid. Distributed Generation (DG) produces different electrical energy, because it depends on the potential of the surrounding environment. With the help of this Distributed Generation (DG), power losses that occur when distributing electricity to customers can be minimized. Determining the capacity of Distributed Generation (DG) is important as information data to determine the next steps/policies to be taken.

This final project offers a methodology to determine the optimization of DG capacity, using the Particle Swarm Optimization (PSO) method. Modeling analysis of distributed power generation capacity optimization using MATLAB software with the object of research is a single line diagram of the distribution system of the electricity network at the Faculty of Electrical Engineering, Telkom University. In this final project, the best distributed generation (DG) capacity is 4kW, and its location is on bus 6 (building N). With the value of power losses before installation of DG is 0.38114 kW, and the value of power losses after installation of DG is 0.017013. In the analysis of this research, optimization of DG capacity can reduce power losses that occur in the electrical system of the Faculty of Electrical Engineering, Telkom University and improve the voltage value for each load.