

## ABSTRACT

*Abstract-* Indonesia has followed the international agreement by following the 2015 Paris Agreement, where Indonesia plans to maintain the temperature increase at  $1.5^{\circ}\text{C}$ , thus requiring efforts to maintain it. The largest contributor to emissions comes from coal-fired power plants. Coal fuel has a latent hazard impact and emissions that are harmful to human health to the point of death. So it is necessary to optimize each power plant operation by determining the optimal power plant scheduling in order to meet the load demand without violating the specified limits and to minimize production costs with the lowest emissions. Economic Emission Dispatch (EED) will reduce the total fuel cost and the respective total emissions of the system. This research develops EED on hydrothermal power plant using Simulated Annealing (SA) Algorithm in Java Bali 500 kV hydrothermal power plant. The SA method is a search method inspired by the process of strengthening a material by increasing the temperature and then lowering the temperature of the material gradually. The results obtained from the optimization process are used to recommend a proposed regulation to help the government overcome the emission problem. The results obtained from the simulation process a total emission reduction of 2,443,057,720 Gram / 4Hour. The best condition can be seen in condition III with emission reduction of 2.6% with  $W_c$  0.5 and  $W_s$  0.5. So it can be concluded that the results of the simulation can help the government in dealing with the emission crisis in Indonesia.

Keywords: Economic Emission Dispatch (EED), Simulated Annealing (SA), 500kV Java-Bali Electric Power System.