In this study, a combined cycle power plant with a nominal capacity of 500 MW, including two gas turbine units and one steam turbine unit, is considered by a mathematical model. This multi-objective optimization has been carried out by using the Non-Dominated Sorting Genetic Algorithm (NSGA-II). The results indicate that the efficiency of the combined cycle power plant depends on the design parameters including gas turbine input temperature, compressor pressure ratio, and pinch point temperature.