*Abstract –*

*In recent years, renewable energy got worldwide attention because more than 80 percent of the world current energy supply comes from fossil fuels like coat and oil, which are eventually, will run out of supply. Solar energy has received a lot of attention in the field of renewable energy systems because the potential of energy that can be produced, demonstrate by the fact that more energy falls on earth from the sun in one hour than the usage of the entire world in one year. Photovoltaic arrays composed of several photovoltaic cells that connected by cable grid. There are several configurations but we chose the series array because in ideal terms it performs the best. Performance of photovoltaic cells affected by many parameters like irradiance, temperature and angle-of-incidence (AOI) etc. We want to improve three parameters of photovoltaic arrays - the distance between cells to save unnecessary cables, which are very expensive, the total shade on the array that affected by the distance between cells and the angle of incidence from the irradiance coming from the sun to the photovoltaic cell. Our solution regards to the stage before the establishment of the array, and not for adjustable cells. The solution is based on the area size of the field designate for the PV array, the cell length and width, the north to south angle to the sun and the location in the world. We offer a solution by using a genetic algorithm to optimize those parameters in terms of minimum cost and maximum power produce by the photovoltaic array.*