Due to the increasing number of mobile users, there is a huge demand of Base Transceiver Station (BTS) particularly in rural and semi urban areas. These BTS are operated on diesel generator (DG) and also connected with the existing grid supply. However, the grid supply is rarely available in most of the remote locations. Therefore, diesel generators are mainly used for providing the continuous supply to BTS and causes lot of emissions.

In view of the above problems, a renewable energy based hybrid power system is proposed to fulfill the requirement of BTS. In this work, a hybrid model based on solar photovoltaic (SPV)/battery/diesel generator (DG) set is proposed for remote BTS application using HOMER (Hybrid Optimization Model for Electric Renewable) software. Further, techno-economic analysis with environmental benefits has been done and presented in this paper. In addition, sensitivity analysis has been performed for the proposed model. The proposed model gives reduced cost of energy (COE) of $ 0.217 as compared to $ 0.266 of the existing diesel generator system. Also, the reduction in CO2, CO, UHC, PM, SOx and NOx emission is 17.138,
0.419, 0.0473, 0.0318, 0.344, 3.78 tonnes per year respectively.

References


Index Terms

Computer Science

Power Systems
Keywords

Renewable energy, solar photovoltaic, HOMER, greenhouse gas emissions.