Abstract

Pakistan is a country having huge potential in solar PV systems. At present Pakistan's energy sources is mainly Independent Power Producers (IPPs). These IPPs use fossil fuels notably coal as a source for fuel. Coal caused environmental issues as it has a high rate of carbon emission. Causing global as well as local level problems. The prices of fossil fuels move up and down causing financial problems for Pakistan. Zero Energy Buildings (ZEBs) could be the way out to this problem in Pakistan. In this thesis, a local household in the residential area of Lahore, Pakistan is considered. A solar PV system with a rechargeable battery is considered in this design. Simulations have been carried out to check the feasibility of ZEBs in Pakistan's residential areas. In Pakistan, as per economic conditions, mostly very less attention is paid to the design of buildings. To reduce the load on the solar PV system, load scheduling is considered. Load scheduling is carried out according to the consumption of electricity in a specific household. A fuzzy logic controller is used to manage the load side consumption. Loads are divided into groups concerning the time of usage and intensity of usage. Loads are managed concerning the time in which they are operating and the amount of input power from solar panels. Decision making is carried out using Fuzzy logic and a different set of loads are either switched on or off. Simulations have been carried out to test the scheduling and overall potential for the implementation of ZEBs in Pakistan.