

ABSTRACT

Increasing concern of global warming, advancement in solar technology, liberalization in government policies to generate clean and green energy and encouragement to use Electric Vehicle (EV) for reducing CO_2 emission makes a potential rise of Solar Photo-voltaic (SPV) installations and use of EVs. Both SPV and EV integration to the grid generate potential benefit but at the same time requires special care for the reliable and stable operation of the grid. This needs a thorough and careful analysis of the network. This thesis analyses the 11 kV active distribution network of IIT Gandhinagar campus. The study investigates the impact of the on campus 500 kWp solar generation on the network. Quasi-state load flow analysis has been carried out by considering the seasonal and diurnal variation of the load and solar generation data with a 15 minutes sampling rate. EVs are considered to be an extra burden to the grid. Proper scheduling of EVs is necessary as they can overload the system for a very short period of time. The thesis also gives an EV scheduling technology to reduce the total cost of charging energy for the potential benefit of the user.