Abstract

This paper presents our analysis of the impact of integrating electric vehicles (EVs) and rooftop photovoltaic (RTPV) on the power system distribution feeders at the 11 kV level. For the assessment, we selected a sample urban feeder that served both domestic and commercial consumers within Bengaluru city limits. The EV-demand projection was considered on the basis of a report by Indian Institute of Technology, Kanpur, while the RTPV potential was estimated using CSTEP's Rooftop Evaluation for Solar Tool (CREST). The feeder was modelled and simulated using the Electrical Transient Analyzer Program (ETAP) software tool. Various load-flow scenarios were run to analyze the feeder capability for integrating EVs and RTPVs for horizon year 2025. The simulation results reveal that the selected feeder will be critically loaded due to the EV-charging demand, during the evening peak hours. With optimal integration of RTPVs and daytime EV charging, the increased demand can be met without augmenting the feeder capacity.