

# Power management strategy to enhance the operation of active distribution networks

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## Abstract

This paper focuses on the power management of renewable energy based distributed generators (RDGs) installed in medium voltage distribution networks (DNs). The goal of the study is to propose a strategy that improves the operation of the distribution network by utilizing the available resources efficiently. This is achieved by continuously managing the output power from the RDGs to meet the required demand. To achieve this task, the proposed strategy is divided into two stages; short-term planning stage and distribution network operation stage. In the short term planning stage, optimal power flow (OPF) is used to determine the output of the RDGs using forecasted data. The aim of the OPF is to minimize the power loss of the distribution network. The second stage aims to manage the actual output power of the RDGs using a multi-agent system (MAS). This stage is responsible for controlling any power imbalance that occurs between the generation and demand in each zone until the OPF is executed in the next time step. The OPF is performed using Particle Swarm Optimization (PSO) implemented in MATLAB, while the MAS is implemented in the JADE environment.

*5th International Istanbul Smart Grid and Cities Congress and Fair (ICSG), 19 – 21 April, 2017, Istanbul, Turkey. 2017, April*