World Academy of Science, Engineering and Technology
International Journal of Industrial and Systems Engineering
Vol:17, No:09, 2023

Quantifying the Methods of Monitoring Timers in Electric Water Heater for Grid Balancing on Demand-Side Management: A Systematic Mapping Review

Authors : Yamamah Abdulrazaq, Lahieb A. Abrahim, Samuel E. Davies, Iain Shewring

Abstract : An electric water heater (EWH) is a powerful appliance that uses electricity in residential, commercial, and industrial settings, and the ability to control them properly will result in cost savings and the prevention of blackouts on the national grid. This article discusses the usage of timers in EWH control strategies for demand-side management (DSM). Up to the authors' knowledge, there is no systematic mapping review focusing on the utilisation of EWH control strategies in DSM has yet been conducted. Consequently, the purpose of this research is to identify and examine main papers exploring EWH procedures in DSM by quantifying and categorising information with regard to publication year and source, kind of methods, and source of data for monitoring control techniques. In order to answer the research questions, a total of 31 publications published between 1999 and 2023 were selected depending on specific inclusion and exclusion criteria. The data indicate that direct load control (DLC) has been somewhat more prevalent than indirect load control (ILC). Additionally, the mixing method is much lower than the other techniques, and the proportion of Real-time data (RTD) to non-real-time data (NRTD) is about equal.

Keywords : demand side management, direct load control, electric water heater, indirect load control, non real-time data, real-time data
Conference Title : ICDMCA 2023 : International Conference on Demand Management and Control Applications
Conference Location : Singapore, Singapore
Conference Dates : September 04-05, 2023