Application of occupancy-interlinked inhabitant behavior variables for improved energy and load profiles modeling

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Abstract:

Most simulation tools replicate the deterministic physical behavior of households particularly in energy load with repeated typical patterns of occupants' activities and occupancy without reproducing the active occupancy and occupants' interactions within such households. In so doing, this imparts peak demand/energy inaccurate information as encountered worldwide and the exaggerated energy savings estimation undertaken by government and utilities. This study entails the performance assessment of an ANN-based approach with the application of occupancy-interlinked inhabitant behavior variables in residential households. The application of such variables reinforces the ANN model to handle uncertainty and volatility of data to ascertain adroit forecasting of energy load profiles. The model produced a good coefficient of determination ($R2$) and correlation coefficient (r). This model is projected to contribute mostly to energy load profile modeling, energy, utilities and measurement, and verification exercise.

Published in: 2020 IEEE PES/IAS PowerAfrica
Date of Conference: 25-28 Aug. 2020
Date Added to IEEE *Xplore*: 12 October 2020
ISBN Information:
INSPEC Accession Number: 20054191
DOI: 10.1109/PowerAfrica49420.2020.9219940
Publisher: IEEE
Conference Location: Nairobi, Kenya

I. Introduction

Practically every single aspect of contemporary life is based around energy which instigates increased energy demand. The world is facing challenges due to high energy demand. About a decade ago the main energy supplier in South Africa being Eskom has encountered a lot of difficulties, struggling to achieve the tolerable electricity reserve margin. As a result, the country experienced seasonal load shedding, although strategies for demand-side management (DSM) are duly employed. Eskom has conducted several DSM initiatives and strategies to reach its goal to evade load shedding, nevertheless, the unfitting measurement of the usage of energy from such approaches have contributed to their efficiency [1].

References

References is not available for this document.