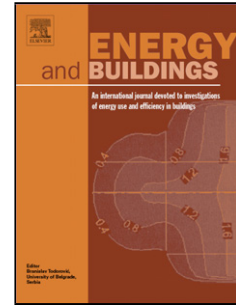


Accepted Manuscript

Title: Pareto tribe evolution with equilibrium-based decision for multi-objective optimization of multiple home energy management systems

Authors: Dezhi Wang, Xiaoshun Zhang, Kaiping Qu, Tao Yu, Zhenning Pan, Qianjin Liu



PII: S0378-7788(17)31418-4
DOI: <https://doi.org/10.1016/j.enbuild.2017.10.072>
Reference: ENB 8092

To appear in: *ENB*

Received date: 20-4-2017
Revised date: 21-9-2017
Accepted date: 22-10-2017

Please cite this article as: Dezhi Wang, Xiaoshun Zhang, Kaiping Qu, Tao Yu, Zhenning Pan, Qianjin Liu, Pareto tribe evolution with equilibrium-based decision for multi-objective optimization of multiple home energy management systems, Energy and Buildings <https://doi.org/10.1016/j.enbuild.2017.10.072>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Pareto tribe evolution with equilibrium-based decision for multi-objective optimization of multiple home energy management systems

Dezhi Wang^{a,b}, Xiaoshun Zhang^{a,b,*}, Kaiping Qu^{a,b}, Tao Yu^{a,b}, Zhenning Pan^{a,b}, Qianjin Liu^{a,b}

^a College of Electric Power, South China University of Technology, 510640 Guangzhou, China

^b Guangdong Key Laboratory of Clean Energy Technology, 510640 Guangzhou, China

* Corresponding author. Tel.: +86 15017527246.
E-mail address: xszhang1990@sina.cn (X. S. Zhang).

Abstract--This paper proposes a novel Pareto tribe evolution (PTE) with equilibrium-based decision for multi-objective optimization of multiple home energy management systems (HEMS). The multiple HEMS are divided into three types according to their electrical appliances, thus the curse of dimension resulted from massive controllable electrical appliances can be effectively addressed. Three objective functions including maximization of consumer satisfaction, minimization of energy cost, and minimization of peak-to-average ratio of the load profile are simultaneously optimized by PTE, in which the best compromise solution is determined through Nash equilibrium based decision making according to the obtained Pareto front (PF). In order to obtain a uniform and widespread PF, the efficient search mechanism for tribe division, reproduction and migration are presented to achieve an exact local search and a synergistic search among all the individuals. The performance of PTE for multi-objective optimization of multiple HEMS has been evaluated with 100-HEMS.

Keywords – Pareto tribe evolution; Nash equilibrium; Multi-objective optimization; Multiple household energy management systems

* Corresponding author. Tel.: +86 15017527246.
E-mail address: xszhang1990@sina.cn (X. S. Zhang).

Download English Version:

<https://daneshyari.com/en/article/6729070>

Download Persian Version:

<https://daneshyari.com/article/6729070>

[Daneshyari.com](https://daneshyari.com)