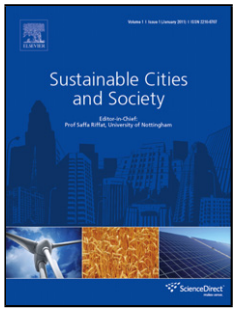

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PII: S2210-6707(17)31089-2
DOI: https://doi.org/10.1016/j.scs.2017.12.033
Reference: SCS 905

To appear in:

Received date: 20-8-2017
Revised date: 25-12-2017
Accepted date: 25-12-2017

Please cite this article as: Shakouri G., Hamed., Rahmani, Mahboobeh., Hosseinzadeh, Mahnaz., & Kazemi, Aliyeh., Multi-objective Optimization-Simulation Model to Improve the Buildings' Design Specification in Different Climate Zones of Iran.*Sustainable Cities and Society* https://doi.org/10.1016/j.scs.2017.12.033

Multi-objective Optimization-Simulation Model to Improve the Buildings' Design Specification in Different Climate Zones of Iran

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Highlights

- An optimization-simulation model is proposed to improve the energy efficiency measures of buildings.
- The optimization model allows for simultaneous minimization of cost and thermal energy consumption.
- Different building systems are considered according to the various climates and cultures of Iran.
- Simulations are performed by the BCS19 software to evaluate the Pareto optimal alternatives.

Abstract

The building sector is responsible for approximately 40% of the total annual worldwide consumption of energy. In Iran, subsidy policies of energy supply have caused it to be more than 2.5 times of the global consumption. As a result, buildings' energy efficiency improvement must be considered important for Iranian designers and researchers. However, this issue has not received due attention yet. Thus, the present study aims to shed new light on the buildings' energy efficiency planning in Iran by adopting a multi-objective optimization-simulation model in order to provide a set of optimum possible solutions for improving the energy efficiency measures of buildings located in different climate zones of the country. The proposed model aims at determination of envelope materials, and types of active/passive cooling/heating systems to optimize the economic and environmental performance of the overall system. The model is applied to a building categorized as type-one