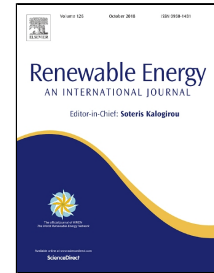


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Comparative Study of Solar-Powered Underfloor Heating System Performance in Distinctive Climates

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Abstract

According to the International Energy Agency, buildings are the largest energy-consuming sector globally, producing over one-third of greenhouse gas emissions in 2013. Renewable energies such as solar can be harnessed to fully or partially meet the energy demands of buildings. In this study, solar thermal collectors are used in a building to provide the hot water required for an underfloor heating system. Three cities in Iran, namely Tabriz, Tehran and Kish island, with distinctive climatic conditions are considered to gain a better understanding of the performance of solar-powered underfloor heating systems in different climates. Moreover, an economic analysis is conducted to assess the feasibility of the proposed system. DesignBuilder software is applied to simulate the energy performance of the building. The results indicate that

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