Cooling energy saving in residential buildings in UAE by shading and night ventilation

Somaya Abouelfadl

Abstract:

This research looks for a better room air temperature through passive and hybrid cooling processes with the aim at reducing cooling energy consumption in residential buildings in UAE. UAE lies in the Arabian golf area and has a large area in desert. Desert has a severe hot and dry climate. A mathematical model has been used to calculate the effects of shading and summer night ventilation on internal house temperature and house cooling energy savings. Different windows, roofs, and walls shading effects have been investigated. Summer night ventilations influences have also been studied. A computer, energy simulation program for buildings has been used to calculate hourly every day over the year the room air temperature, humidity, cooling energy needs and others. With different variables, results have been plotted for a representative summer day (15 July). With 80% window shading, roof and wool shading accompanied with summer night ventilation of 50 h-1 the north and south room temperature is reduced by around 13 K. In addition, the cooling energy required for the house is saved by approximately 65 %.

Keywords:

Energy saving, walls shading, night ventilations, air temperature, cooling energy needs, window shading.

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