

Sustainability and Comparative analysis of the canopy as a building shell with the goal of energy efficiency

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Abstract

The growth of energy consumption has made the world encounter to threatening changes in today's societies, in addition to intensification of the risk of fast termination of fossil fuels; Hence in international programs and policies, energy has been find special significance for sustainable development. A significant portion of energy consumption (About 40%), is in the building sector for cooling, heating and ventilation. The building shell is an efficient component in sustainable architecture. In order to achieve proper design with climate principles, with three general approaches to building layers encountered: 1.Shell as the separator of the building out of atmospheric conditions; through thermal resistance (insulating), 2.Shell as a thermal mass (delaying the heat transfer from the body of the building), 3.Shell as a storage and distributor of heat in building. The canopies are a kind of shell, which can cover all three of these features. The shell's work in most of the time is shading, light reflection and providing thermal capacity, the cases which canopies have them inherently. Among the main questions of the present research, we can mention the following: 1.How can the canopy coincides into buildings surface and optimizes energy consumption? 2.What features should a coinciding shell's canopy have in terms of climate challenges and what kind of canopies can be placed in this position? Canopies have different categories such as: Outer or Inner, Horizontal or Vertical or Frame, Animated or Fixed. The main objective of this research is to match the canopy as an intelligent building shell in order to reduce energy consumption in residential buildings in hot and dry climate.

Keywords: Sustainability; Smart Canopy; Energy Conservation Optimization; Building Shell; Renewable Energy; Canopy as Shell;