COMPREHENSIVE DESIGN STRATEGIES FOR SUSTAINABLE TIMBER-Glass BUILDINGS

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Abstract: (250 to 500 words: for each heading use the bullet points or narrative - the submission including graphics should not exceed one page)

Problems - Issues / Challenges-Needs
In view of reducing the negative environmental impacts and increasing the quality of built environment the development of design strategies linking various aspects of sustainability became crucial in architectural and structural planning. Considering alternative and eco-friendly solutions in residential and public building construction requires the use of integrative and interdisciplinary design approach, where buildings are treated as comprehensive system fulfilling multiple demands, such as functional, aesthetic, structural, safety, environmental and energy efficiency.

Solutions - Methods / Results - Findings
Contemporary buildings are mostly subject to attractive modern design characterized by large glass areas enabling adequate daylighting and use of solar gains, which on the other hand opens several problems regarding structural demands. In this manner, the role of responsible and sustainable design has to be oriented towards consideration of various design aspects, into an understanding of various disciplines and not preferring only individual design criteria which have been shown in the past as low quality and partial solutions.

The current paper presents a comprehensive overview of the research considering the design of timber-glass buildings. Firstly, it explains the needs for such a building design and secondly, it shows the role and importance of integration of architectural, energy, environmental and structural design. Various researches on building structural stability, energy efficiency, indoor environmental quality and environmental assessment are briefly presented forming an integrated, holistic design strategy for sustainable timber-glass buildings. The integration of individual researches shows the existence of a strong correlation between the building shape, design of glazing areas, selection of building materials, structural design and building quality in terms of sustainability indicators such as environmental and energy performance, structural safety, indoor environment quality and functionality.

Novelty - Value / Relevance to …
The contribution presents a comprehensive approach to the design of timber-glass buildings considering the issues of energy efficiency, environmental performance and structural design. The conclusions can be used by designers for new built design or the development of renovation strategies for existing buildings.

Forum statement
Reaching the sustainability of buildings is possible only through integrative and interdisciplinary design approach.

Keywords: (up to 5 keywords)
timber-glass buildings; energy-efficiency; environmental impact, structural design

Graphics: (please use the gray area below for representative graphics or graphical summary: select the gray area below and paste your graphics)