

Sustainable energy performances of green buildings: a review of current theories, implementations and challenges

ABSTRACT

This study targets to elucidate the essence of sustainability in green building design implementations. In this regard, the study draws attention to the sustainable energy performances of green buildings to identify the influential parameters based upon the contemporary successful accomplishments. The study elaborates on the contemporary trends and applications of green building design and the respective impacts on sustainable developments. As a result, the analytical review confirms that the sustainable energy performance of green buildings has been transformed to a sensible and practical resolution to alleviate the CO₂ emissions and diminish the building sector energy consumption. In addition, with view to the current challenges and barriers, the study concludes that; it is still crucial to identify and develop efficient energy solutions associated with green buildings for addressing the future energy demands. Likewise, the findings highlight that the sustainable energy performances associated with integrated technologies and renewable energy systems are still intertwined with significant challenges related to the fundamental parameters of cost, maintenance, and operation. In conclusion, the contemplations of the research findings are recommended to be taken into consideration by architects, engineers and developers for the development of future eco-cities with an explicit viewpoint towards developing greener and smarter built environments.

Keyword: Building energy performance; Renewable energy; Sustainable built environments; Green buildings; Future cities development