

Impact of Building Orientation on Energy Performance of Buildings in Kabul, Afghanistan

Authors : Mustafa Karimi, Chikamoto Tomoyuki

Abstract : The building sector consumes 36% of total global energy used, whereas only residential buildings are responsible for 22% of that. In residential buildings, energy used for space heating and cooling represents the majority part of the total energy consumption. Although Afghanistan is amongst the lowest in energy usage globally, residential buildings' energy consumption has caused serious environmental issues, especially in the capital city, Kabul. After decades of war in Afghanistan, redevelopment of the built environment started from scratch in the past years; therefore, to create sustainable urban areas, it is critical to find the most energy-efficient design parameters for buildings that will last for decades. This study aims to assess the impact of building orientation on the energy performance of buildings in Kabul. It is found that the optimal orientation for buildings in Kabul is South and South-southeast, while West-northwest and Northeast orientations are the worst in terms of energy performance. The difference in the total energy consumption between the best and the worst orientation is 17.5%.

Keywords : building orientation, energy consumption, residential buildings, Kabul, environmental issues

Conference Title : ICSBTE 2023 : International Conference on Sustainable Buildings Technologies and Environment

Conference Location : Zurich, Switzerland

Conference Dates : January 16-17, 2023