

## Net-zero building designs in hot and humid climates: A state-of-art

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### ABSTRACT

Net Zero building is becoming a global trend as a strategy to reduce the carbon footprint. In order to achieve Net-Zero building design in hot and humid climates, efforts must be put to reduce the overall energy use to the maximum extent by integrating appropriate building technologies into the architectural designs. In this paper, the latest ideas dealing with building performances and net-zero building design projects, are reviewed and an outlook is given including new concepts of combined systems in hot and humid climate regions. The paper is structured in the following manner which includes basic guidelines, natural ventilation systems, cooling and dehumidification, insulation and construction materials, reviews of several net-zero energy building projects. The paper also proposes novel wind tower dehumidification design and ventilated attic building design for the hot and humid region. Thus the state of art review is presented for net-zero buildings in a hot and humid climate.

### KEYWORDS:

Net zero buildings; Wind tower; Solar chimney; Natural ventilation; Dehumidification; Hot and humid