

## Natural Ventilation for the Sustainable Tall Office Buildings of the Future

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**Abstract :** Sustainable tall buildings that provide comfortable, healthy and efficient indoor environments are clearly desirable as the densification of living and working space for the world's increasing population proceeds. For environmental concerns, these buildings must also be energy efficient. One component of these tasks is the provision of indoor air quality and thermal comfort, which can be enhanced with natural ventilation by the supply of fresh air. Working spaces can only be naturally ventilated with connections to the outdoors utilizing operable windows, double facades, ventilation stacks, balconies, patios, terraces and skygardens. Large amounts of fresh air can be provided to the indoor spaces without mechanical air-conditioning systems, which are widely employed in contemporary tall buildings. This paper tends to present the concept of natural ventilation for sustainable tall office buildings in order to achieve healthy and comfortable working spaces, as well as energy efficient environments. Initially the historical evolution of ventilation strategies for tall buildings is presented, beginning with natural ventilation and continuing with the introduction of mechanical air-conditioning systems. Then the emergence of natural ventilation due to the health and environmental concerns in tall buildings is handled, and the strategies for implementing this strategy are revealed. In the next section, a number of case studies that utilize this strategy are investigated. Finally, how tall office buildings can benefit from this strategy is discussed.

**Keywords :** tall office building, energy efficiency, double-skin façade, stack ventilation, air conditioning

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