

Occupant's thermal comfort in Qatari offices – Need for the new adaptive standard

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ABSTRACT

Qatar's per capita energy consumption is one of the highest in the world, consuming 30.184 TWh as of 2012. Buildings contribute significantly (80%) to this, with air-conditioning taking a lion's share. Qatar does not have custom-made adaptive thermal comfort standards (ACS). In their absence, designers tend to follow Western standards that are meant for colder climates verbatim. This leads to the disregard of the effect of local climate, clothing and cultural needs. Availability of cheap energy encourages such practice. Following the ACS is vital for energy savings in buildings. In this paper, we aim to develop the ACS for Qatar. It necessitates long-term field studies in real buildings. This paper presents the results of long-term thermal comfort field surveys in eight Qatari offices. The occupant's thermal perceptions along with the environmental measurements were recorded in these surveys. This was done during the winter in Doha. A total of 40 subjects expressed comfort over a wide range of temperatures in offices. They returned 1362 sets of data, of which 27% were from women. Fanger's PMV overestimated the actual sensation. These findings have far-reaching energy implications towards environmental sustainability as specified in Qatar Vision 2030.

Keywords: Thermal comfort, adaptive comfort standard, office buildings, occupant adaptation, sustainability, energy use

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