

## Field Study on Thermal Performance of a Green Office in Bangkok, Thailand: A Possibility of Increasing Temperature Set-Points

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**Abstract :** In the tropics, indoor thermal environment is usually provided by a cooling mode to maintain comfort all year. Indoor thermal environment performance is sometimes different from the standard or from the first design process because of operation, maintenance, and utilization. The field study of thermal environment in the green building is still limited in this region, while the green building continues to increase. This study aims to clarify thermal performance and subjective perception in the green building by testing the temperature set-points. A Thai green office was investigated twice in October 2018 and in May 2019. Indoor environment variables (temperature, relative humidity, and wind velocity) were collected continuously. The temperature set-point was normally set as 23 °C, and it was changed into 24 °C and 25 °C. The study found that this gap of temperature set-point produced average room temperature from 22.7 to 24.6 °C and average relative humidity from 55% to 62%. Thermal environments slightly shifted out of the ASHRAE comfort zone when the set-point was increased. Based on the thermal sensation vote, the feeling-colder vote decreased by 30% and 18% when changing +1 °C and +2 °C, respectively. Predicted mean vote (PMV) shows that most of the calculated median values were negative. The values went close to the optimal neutral value (0) when the set-point was set at 25 °C. The neutral temperature was slightly decreased when changing warmer temperature set-points. Building-related symptom reports were found in this study that the number of votes reduced continuously when the temperature was warmer. The symptoms that occurred by a cooler condition had the number of votes more than ones that occurred by a warmer condition. In sum, for this green office, there is a possibility to adjust a higher temperature set-point to +1 °C (24 °C) in terms of reducing cold sensitivity, discomfort, and symptoms. All results could support the policy of changing a warmer temperature of this office to become "a better green building".

**Keywords :** thermal environment, green office, temperature set-point, comfort

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