Determining base temperature for heating and cooling degree days for India

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Determining base temperature for heating and cooling degree-days for India

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Abstract

Internationally, the cooling degree-days (CDD) and heating degree-days(HDD) have been commonly used as indicators of cooling and heating load occurring due to outdoor temperature. These indicators have also applied for classification of climate zones as referred in ASHRAE Standard 169-2013. As of now various base temperatures has been used in the different part of the world. Additionally, the analysis for base temperature had been done in 1980 by ASHRAE. This study aims to determine the base temperature for cities in India. The simulation approach has been used to identify base temperature using Energy Signature and Performance line method for 60 cities of India. The US-DOE developed 16 reference buildings which have been used for eight climate zones of India. These eight climate zones have been classified using the methodology of ASHRAE Standard 169–2013 on weather data of Indian cities. It was observed that the cooling base temperature is varying from 6.8 °C to 28.6 °C for the large hotel and 8.7–28.1 °C for office buildings while the heating base temperature is ranging from 13.8 °C to 21.4 °C for the large hotel and 10.4–18.7 °C respectively for different cities. The estimated base temperature for cooling and heating is 18 °C for India.

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