

EGU2020-8931, updated on 02 Mar 2021

<https://doi.org/10.5194/egusphere-egu2020-8931>

EGU General Assembly 2020

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## Energy demand estimates in large Russian cities and its biometeorological characteristics

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To estimate the energy amount needed to heat indoor living and public spaces, the heating degree day (HDD) parameter is applied. This is the most common climatic indicator of energy consumption for the building heating, which is calculated for a certain period of the year by summing the absolute deviations of the average daily ambient temperature from the selected base temperature. However, human biometeorological sensitivity is based not only on the ambient temperature, but on a combination of temperature, humidity, and wind speed.

We have conducted a comparative analysis of the climatic and biometeorological characteristics of the regions including the largest Russian cities. For the effective ambient temperature range of 17.2 to 21.7°C (comfort zone), we have calculated changes in the comfort zone for Moscow, St. Petersburg, Krasnodar, Novosibirsk, and Vladivostok according to data from 1959 to the present. Despite all climate differences between regions with selected cities, allowance for wind speed leads to a decrease in the number of days with temperature within the comfort zone.

This study supported by Russian Science Foundation (project No 16-17-00114).