



## **Impact of Urban Heat Island on the thermal regime of buildings in Bucharest (Romania)**

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Extreme hot events and heat waves occur frequently in Bucharest during the warm season, triggering significant heat stress and thermal risks, especially in buildings with inappropriate ventilation, while climate change scenarios agree upon the warming trend along the next decades. This study investigates the impact of the Urban Heat Island (UHI) on the thermal regime of buildings, in order to develop an alert system capable to issue early warnings when the thermal risk arrives at high levels in Bucharest. The warnings should be accurate regarding the intensity of the risk, the temporal fit and location, and complex information are compiled (e.g. air and land surface temperature, land cover, buildings and flat characteristics). Ground-based meteorological data and satellite products were used for computing the ambient temperature over several test areas for the summer months, and the indoor climate was dynamically modeled with an hourly resolution. The thermal risk was determined using standardized comfort indices, e.g. Predicted Mean Vote (PMV) and Predicted Percentage of Dissatisfied (PPD), and the specific thermal and functional characteristics of the buildings. The study also investigates the influence of the urban characteristics on both the environmental and indoor temperatures. The results were obtained over test areas placed in different urban conditions, and the influence of the UHI on the indoor climate was emphasized. The results were obtained within the national project REDBHI (Reducing urban heat island effects to improve urban comfort and balance energy consumption in Bucharest - PN-II-PCCA-2013-4-0509).