

The impact of microclimate on building energy demand: A district scale simulation method

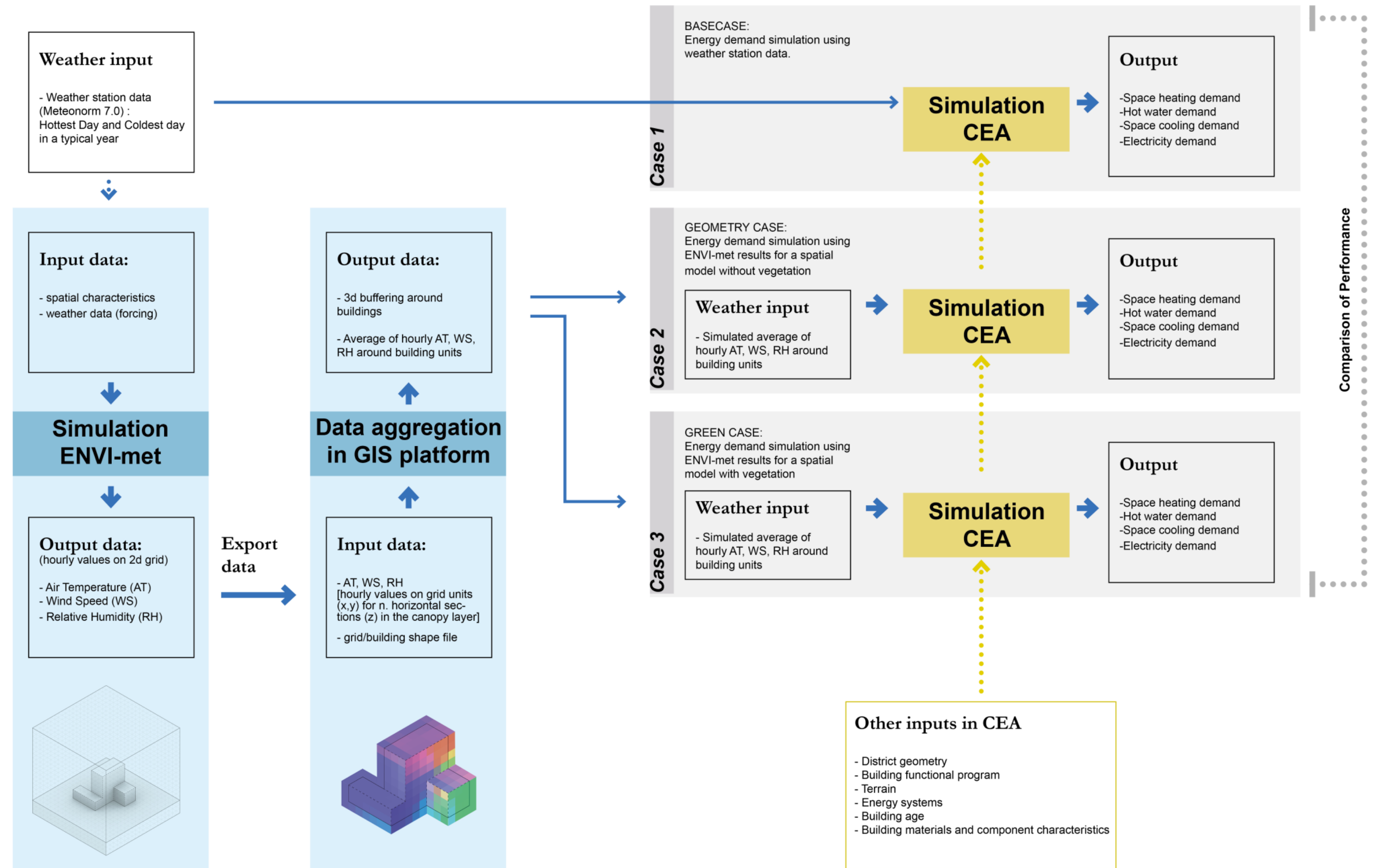
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Abstract

Rapid urbanization and densification processes are globally changing microclimatic environments in which buildings express their energy performance. Although previous studies have demonstrated the relevant impact of urban microclimate on space cooling and heating demand, modelling tools employed to support the design process, largely overlook microclimatic conditions in assessing building energy performance, making use of general weather data. This study presents a computational approach which allows quantitative analysis of building energy demand on a district scale, including interdependent factors such as local air temperature, relative humidity and wind speed, diversity in building geometry and materials as well as user behaviours. The method, which links the ENVI-met microclimate model and City Energy Analyst (CEA) for energy demand calculations, has been applied on a Masterplan for a district development in Zurich in order to analyse the energy performance of the proposed design and define guidelines for improvement.

Methodology



Results

