**A city scale degree-day method to assess building space heating energy demands in Strasbourg Eurometropolis (France)**

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**Abstract:**

Efficient strategies are required to reduce space heating energy demands in buildings at city scale. Models taking into account the dynamic of the Urban Heat Island (UHI) phenomenon may be useful tools to help urban planners in this task. In this paper, we propose a new methodology to assess the energy demands for space heating in buildings at city scale: a degree-day method is applied, coupled with the use of a dynamic urban meteorological model that computes a building energy budget. First, it is shown that the total building space heating energy demand at city scale, as simulated by the meteorological model, is quasi- linearly dependent on the daily mean city scale air temperature. The developed city-scale degree-day method applied to assess the space heating energy demands in Strasbourg Eurometropolis (France) is shown to be consistent with the estimates issued by local official energy sources. A sensitivity analysis highlights the fact that while the heating energy demands are dependent on the building insulation performance and thermostat heating temperatures, scenarios in which building energy properties are changed do not significantly affect the UHI.

**Key words:** Building space heating energy, Urban heat island, Degree-day method