



Analysis of the relationship between the urban heat island intensity and the heating/cooling energy consumption in a renovated part of Budapest

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The artificial surfaces and buildings modify the natural environment and affect the local climatic conditions of cities. An important sign of this modification is the urban heat island (UHI) intensity, which is the temperature difference between the densely built-up inner areas and the rural surroundings around the city. The UHI intensity can be detected by studying the data collected from in-situ air temperature measurements and/or surface temperature data from satellite measurements. For this urban climatology research we use the often used data of MODIS sensor, which can be found on the Terra and Aqua satellites of NASA.

Ferencváros, the district IX of Budapest is a very heterogeneous area of the Hungarian capital. Since the 1980s the local government has launched various renovation programs. The main aim of these programs is to improve the environment by modernising the buildings and increasing both the number and the size of green areas in the region. Some parks have been renewed and new green areas have been created as well. One of the development plans is the so-called block rehabilitation program. As a part of this program, the old buildings were totally demolished in Central Ferencváros, and left non-built-up, so that the central areas of the blocks turned into small parks.

For the urban dwellers the heating and cooling energy consumption is a very important factor. Energy use is affected by the condition of the buildings as well as the outside temperature. This analysis examines (i) the UHI intensity based on the surface temperature data of the MODIS sensor, and (ii) its relationship to the heating and cooling energy consumption of Ferencváros. The main question to be answered in this study is whether the rehabilitation programs have a positive effect on UHI and energy consumption.