

## **Future possibilities of green walls in a medium sized Hungarian town – A case study of Kecskemét**

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Adaptation to climate change is probably one of the most urgent tasks for settlements, especially for larger cities. In the case of densely built cities, the challenge is to manage the negative processes of urban heat islands, which can be detected particularly during summer periods.

In our work, we focus on the possibilities of green wall applications. Green walls are important elements of green infrastructure and have a crucial role in modifying the microclimate. They can also contribute to reducing energy usage. Our aims are the following: to show the function of green walls as parts of a green infrastructure and to predict expected changes in importance before 2050, based on the example of Kecskemét. This town is a relatively large settlement in Hungary, with 114,000 inhabitants. The city is located in the climate-sensitive Carpathian basin, on the sand ridges between the Danube and Tisza rivers. From the point of view of green infrastructure, Kecskemét is certainly not among the worst settlements, thanks to its so-called "green zone," an arboretum and leisure park with a substantial water surface. However, in spite of the green zone, the microclimatic circumstances of the downtown are not entirely favorable. One reason for this is the lack of green surfaces in the streets, in the squares, and in the relatively small housing plots; such potential green surfaces could improve air quality and decrease local temperature anomalies.

Currently, there are no outdoor green walls in Kecskemét, which leaves open a great opportunity for development. However, not every building is a good candidate to be covered with plants. In this work, we do not examine private buildings, where the use of green infrastructure depends on the personal decisions of the inhabitants and owners; in contrast, urban management and local developers could be required to build green infrastructure. Therefore, in our study, we focused on public buildings with the exception of renovated, modernized structures and tourist attractions such as town halls, churches, etc. The local strategies and environmental programs emphasize the health status and the comfort of the population, topics which are strongly correlated with climate-conscious attitude and solutions. We draw attention to the importance of green infrastructure and future development opportunities, and we quantify the energy savings that result from less heating and air-conditioning in green infrastructure buildings.