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The effect of vertical urban greening on historical building materials

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Due to hard coverage and building infrastructures, cities experience higher temperatures and higher pollution levels in their city centre relative to their less dense surroundings. This urban heat island effect is receiving an increasing amount of attention and concern. In response, cities are implementing green initiatives to mitigate elevated temperature and pollution levels, improving the health and well-being of their residents. However, the urban heat island is typically the largest in the historical core of the city, where the abundance of built heritage can make the implementation of green initiatives difficult. The dense urban fabric and the rules of conservation make such an implementation inconvenient. A major concern is how green initiatives might affect the condition of the historical building materials.

Therefore we scope the compatibility of vertical greening with built heritage, in terms of microclimatic changes, and considering impacts of salt crystallization, frost events, biodeterioration and pollutant deposition. The vertical greening represents vegetation growing along exterior walls. Either plants, rooted on the ground, climb up the facade by attaching themselves on the vertical surfaces or plants hang down from the top of the facade. Monitoring case studies in Antwerp and laboratory studies will help us investigate key changes, beneficial or adverse, in the material condition of heritage buildings. This project will develop our understanding of the relationship between the green initiatives and the historical materials in an urban area.