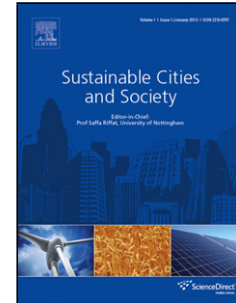


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# A Methodology to Determine the Potential of Urban Densification through Roof Stacking

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## HIGHLIGHTS

- Seven approaches present solutions for urban densification
- Successful roof stacking requires integrating urban, engineering and architectural aspects
- European cities have a great potential to be densified through roof stacking
- 30% of the population increase could be covered by roof stacking in Brussels

## ABSTRACT

Facing the need to accommodate a growing number of inhabitants in major European cities, this research aimed to establish a methodology that facilitates decision making on urban densification through roof stacking. The methodology adopts a systematic approach on three consecutive levels: urban, engineering, and social. Multiple criteria are identified to assess and map the roof stacking potential in terms of location and number of added floors. The Brussels Capital Region was chosen as a case study to experiment with the developed workflow chart and validate the proposed approach, using ArcGIS software, by creating a map of the urban densification potential through roof stacking of Brussels at the city scale. The results show a realistic potential of accommodating 30% of the expected population increase in Brussels by the year 2040 using only roof stacking, provided that the current urban regulations are respected. In addition, a theoretical potential to accommodate more than the expected population increase by the same year is proposed provided that urban planning regulations are relaxed in relation to the height of buildings. Further applications to other cities in

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