

Paper Title: An Urban Feasibility Study Into Balancing Upfront Embodied Carbon Emissions Through Integrated Green Areas As Carbon Offsets

Paper Link: <https://ieeexplore.ieee.org/document/9859485>

1 Summary

1.1 Motivation

The upfront embedded carbon emissions in construction present a challenge to traditional approaches for reducing a building's carbon footprint. In order to directly balance these emissions in urban environments, this study investigates the use of integrated green spaces as offsets.

1.2 Contribution

This study takes a fresh look at addressing embodied carbon emissions through urban green areas. It assesses the carbon sequestration capacity of various green spaces, finds city-wide networks as the most effective scale, and underlines the importance of supportive policies and carbon accounting procedures in order to promote and monitor green offset efforts.

1.3 Methodology

The research used a comprehensive methodology that included modeling tools to evaluate both embodied carbon emissions from buildings and the carbon sequestration capacity of various green areas. The models were utilized in a case study focusing on Christchurch, New Zealand, to test their practicality. A thorough multi-scale investigation was carried out, analyzing the usefulness of green spaces at many levels ranging from individual buildings to large metropolitan districts.

1.4 Conclusion

In conclusion the research indicates that the integration of extensive green infrastructure into urban planning can serve as a useful means of achieving carbon emission balance. This strategy not only reduces carbon emissions but also enhances public health, air quality, and climate regulation. Accurate carbon accounting systems and supportive regulations are essential for successful deployment..

2 Limitations

2.1 First Limitation

The study focuses on the carbon sequestration potential of trees and vegetated surfaces. Examining alternative green infrastructures, such as wetlands, green roofs, and vertical gardens, may prove advantageous, with particular benefits contingent on the local environment and available area.

2.2 Second Limitation

The study highlights the importance of investigating and optimizing the design and configuration of green spaces in cityscapes for enhanced carbon sequestration and equitable access.

3 Synthesis

According to the study, creating urban green spaces will be essential to creating net-zero carbon cities and will help shape policy and urban planning for successful integration. Wider adoption could result from more research on the financial feasibility of green offset techniques. Using urban green spaces as carbon offsets has the potential to promote the coexistence of cities and wildlife, resulting in a more resilient and sustainable planet.