

Special Issue

Towards Net-Zero: Decarbonizing the Built Environment Through Operational and Embodied Carbon Reduction

Message from the Guest Editors

Net-zero is the key sustainability goal for the built environment. To truly qualify as a net-zero building, both the operational and embodied carbon footprints must be offset. Over the last few decades of research, the design and development of activities for reducing building energy use in the operational stage has led to significant reductions in operational energy use.

Therefore, with reduced operational energy use, embodied carbon contribution can be significant for the whole-life carbon footprint. This Special Issue aims to advance academic and industry knowledge by addressing integrated strategies, tools, policies, and innovations to reduce the carbon footprint of buildings and infrastructure throughout their lifecycles. We invite original research, critical reviews, case studies, and methodological advancements on topics including, but not limited to, the following:

- Operational carbon reduction
- Embodied carbon mitigation
- Carbon accounting frameworks and benchmarks.

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About the Journal

Message from the Editor-in-Chief

Current urban environments are home to multi-modal transit systems, extensive energy grids, a building stock, and integrated services. Sprawling neighborhoods are composed of buildings that accommodate living and working quarters. However, it is expected that the cities and communities of the future will face complex and enormous challenges, including maintenance, interconnectivity, resilience, energy efficiency, and sustainability issues, to name but a few. A smart city uses advanced technologies and a digital infrastructure to improve the outcomes in every aspect of a city's operations. A smart building optimizes the experience of occupants, staff, and management by using a modern and connected environment. Innovations in technology that can bring dramatic improvements to design, planning, and policy are critical in developing the cities and buildings of the future.

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manuscripts are peer-reviewed and a first decision is provided to authors approximately 14.9 days after submission; acceptance to publication is undertaken in 2.7 days (median values for papers published in this journal in the first half of 2025).