Special Issue

Smart and Sustainable Buildings: Advancing Towards Net-Zero and Intelligent Control

Message from the Guest Editors

In response to climate imperatives, Zero-Energy Buildings (ZEBs) have emerged as a transformative solution to decarbonize the built environment. Achieving net-zero energy consumption is a challenge, requiring interdisciplinary research and innovative solutions across various domains, from architectural design and engineering systems to policy frameworks and occupant behavior. While progress has been made, there remain considerable challenges, including technological integration, cost-effectiveness, performance gaps between design and operation, grid interaction, and scalability. This Special Issue aims to address these challenges by showcasing the latest advancements and practical applications that are pushing the boundaries of ZEB realization. In this Special Issue, original research articles and reviews are welcome. Research areas may include (but are not limited to) the following:

- Innovative ZEB design & materials
- BIPV, micro-wind, geothermal hybridization
- Machine learning and smart control for ZEB optimization.
- Demand response and smart building-grid integration
- Cost-benefit analysis of ZEB technologies
- Human-centric approaches in ZEBs

We look forward to receiving your contributions!

Guest Editors

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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.

Editor-in-Chief

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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).