

Topical Collection

Encyclopedia of Building Performance, Climate Change, and Applied AI

Message from the Collection Editors

The built environment accounts for over one-third of total energy consumption and a significant portion of carbon emissions. With growing pressures to decarbonise buildings, enhance resilience, and achieve net-zero targets, there is an urgent need for innovative approaches that integrate advanced technologies and interdisciplinary research. This Topical Collection seeks to serve as a comprehensive and authoritative reference on how buildings can be designed, operated, and retrofitted to respond effectively to climate change. The following topics are encouraged:

- AI-driven energy modelling and performance prediction;
- Machine learning for building diagnostics and predictive maintenance;
- Digital twins and smart building technologies;
- Retrofit strategies for decarbonisation and energy efficiency;
- Data analytics for occupant behaviour and environmental monitoring;
- Life-cycle sustainability assessment and climate adaptation frameworks.

This collection welcomes both theoretical and applied works, aiming to engage academics, industry professionals, and policymakers seeking innovative, evidence-based pathways to transform buildings into intelligent, climate-responsive systems.

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About the Journal

Message from the Editor-in-Chief

Many international journals have proliferated over the last 20 years regarding very specific themes of research. Thus, I am pleased to announce the new open-access MDPI journal *Encyclopedia* to provide a wide audience platform for the presentation of outcomes and methodological approaches of current interest for the scientific community. Social sciences, humanities, physical sciences, engineering, and life sciences are the principal macro-areas of relevance for the journal. On behalf of the Editorial Board, I welcome all to *Encyclopedia* and invite contributions of entry papers to our editorial project.

Editor-in-Chief

Prof. Dr. Raffaele Barretta

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Author Benefits

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