

Special Issue

Sustainability in Energy and Buildings: Future Perspectives and Challenges: 2nd Edition

Message from the Guest Editors

The global urgency to reduce energy consumption and CO₂ emissions has reshaped the priorities of every sector, with the construction and building industry at the forefront of this transition. Buildings are among the largest energy consumers worldwide, and despite technological advances, energy demand in the built environment has shown a steady increase over the past two decades. Addressing this challenge is critical to achieving climate neutrality goals and ensuring a resilient, sustainable future.

Sustainability in buildings—spanning their design, construction, operation, and end-of-life—is, therefore, one of the most pressing issues of our time. Alongside well-established strategies such as renewable integration, high-performance materials, and lifecycle analysis, emerging tools like artificial intelligence, digital twins, big data analytics, and smart building management systems are opening new pathways for innovation. These technologies, coupled with nature-based solutions and circular economy approaches, hold immense potential to transform buildings from passive consumers into active players in climate change mitigation and adaptation.

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Deadline for manuscript submissions

15 May 2026



Applied Sciences

an Open Access Journal
by MDPI

Impact Factor 2.5
CiteScore 5.5



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