Special Issue

Intelligent Solar Energy Systems for Sustainable and Carbon-Neutral Building Design

Message from the Guest Editors

The transition to carbon-neutral buildings demands a shift from passive solar integration to intelligent, adaptive energy systems. This issue will focus on AI-driven design, control, and optimisation of solar-integrated buildings, addressing challenges in modelling, prediction, and real-time system management. We seek contributions exploring how AI, machine learning, and digital twins can revolutionise the performance and resilience of building-integrated solar systems. Of particular interest are studies on explainable AI for predictive control, uncertainty quantification in solar generation and demand forecasting, and autonomous fault detection for integrated PV and storage. This issue aims to advance the understanding of how intelligent algorithms can optimise energy flows, support adaptive architectural design, and enable buildings to function as active energy producers. Submissions combining computational innovation, experimental validation, and real-world case studies are encouraged. By uniting expertise from energy, computing, and architecture, this issue will define the next frontier of AI-empowered solar technologies for resilient, sustainable, and energy-positive buildings.

Guest Editors

Dr. Mahmoud Dhimish

Renewable Energy, Engineering, and the Environment, University of the Built Environment, Reading RG1 4BS, UK

Prof. Dr. Adel Mellit

Faculty of Science and Technology, University of Jijel, Jijel 18000, Algeria

Deadline for manuscript submissions

31 December 2026

Buildings

an Open Access Journal by MDPI

Impact Factor 3.1
CiteScore 4.4

mdpi.com/si/260709

Buildings
Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
buildings@mdpi.com

mdpi.com/journal/buildings

Buildings

an Open Access Journal by MDPI

Impact Factor 3.1
CiteScore 4.4

mdpi.com/journal/buildings

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

Prof. Dr. David Arditi
Construction Engineering and Management Program, Department of Civil, Architectural, and Environmental Engineering, Illinois Institute of Technology, 3201 South Dearborn Street, Chicago, IL 60616, USA

Author Benefits

High Visibility:

indexed within SCIE (Web of Science), Scopus, Ei Compendex, Inspec, and other databases.

Journal Rank:

JCR - Q2 (Construction and Building Technology) / CiteScore - Q1 (Architecture)

Rapid Publication:

manuscripts are peer-reviewed and a first decision is provided to authors approximately 15.1 days after submission; acceptance to publication is undertaken in 2.9 days (median values for papers published in this journal in the second half of 2025).