Special Issue

Low-Carbon Concrete Solutions for Sustainable Construction: Trends and Perspectives

Message from the Guest Editors

The construction industry is a major source of carbon emissions, with traditional concrete production consuming significant energy and releasing large amounts of CO_2. Considering climate change, resource depletion, and the demand for sustainable infrastructure, innovative low-carbon concrete technologies are gaining attention. These include the use of industrial by-products, recycled materials, carbon capture, low-clinker or clinker-free cements, nanomaterials, and AI-driven mix design. Such approaches aim to reduce emissions across the concrete lifecycle while maintaining structural performance. This Special Issue highlights recent advances in low-carbon concrete, seeking interdisciplinary research bridging material science, structural engineering, and environmental evaluation. Topics include:

- Novel low-carbon binders and supplementary cementitious materials;
- CO_2 mineralization and carbon capture in concrete;
- Machine learning and data-driven concrete mix design;
- Durability and mechanical performance of green concrete.

We welcome submissions showcasing innovations, future challenges, and practical applications in sustainable construction. We look forward to your contributions.

Guest Editors

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Deadline for manuscript submissions

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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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