



Low-Carbon Cement and Concrete in Modern Construction: Towards a Green and Sustainable Future

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Message from the Guest Editors

As urbanisation accelerates globally, the construction industry faces the dual challenge of meeting infrastructure demands while minimising environmental impact. Traditional construction practices, especially the extensive use of concrete, significantly contribute to global carbon emissions—cement production alone accounts for approximately 3.4% of worldwide CO₂ emissions due to fossil fuel combustion. There is, therefore, an urgent need to adopt low-carbon solutions in cement and concrete production to foster sustainable development.

This Special Issue, “Low-Carbon Cement and Concrete in Modern Construction: Towards a Green and Sustainable Future”, aims to address these critical challenges. We invite original research, theoretical and experimental studies, case studies, and review papers that explore innovative approaches to reducing the carbon footprint of cement and concrete.

Relevant topics include, but are not limited to:

- Low-carbon building materials;
- Recycled materials in concrete;
- Alternative cements and binder systems;
- Life cycle assessment of buildings;
- Additives and admixtures for sustainable concrete production.





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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.

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