Special Issue

Recent Advances in Sustainable Low-Carbon Materials for Green Concrete

Message from the Guest Editors

As the largest building materials in volume, concrete and cement-based binders make a significant contribution to global carbon emissions. The carbon emissions released during the manufacturing of cement-based binders can often have detrimental effects on both human health and the environment, highlighting the urgency for the construction industry to adopt greener and more sustainable materials. In pursuit of reduced carbon emissions, the industry actively seeks incremental improvements through various means. These include material selection, waste reduction, reuse and recycling construction and demolition waste, incorporation of new materials, low-carbon development of cement-based composites, and integration of renewable energy sources. In this Special Issue, we are looking for innovative research on sustainable construction materials and new technologies, including low-carbon binders, upcycling of solid wastes into construction products, decarbonization in concrete, CO2 mineralization process, policies and life cycle assessments, cost-effective products, new test methods, case studies, and other relevant studies.

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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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