



Special Issue Reprint

Environmental Impact Assessment of Buildings

www.mdpi.com/books/reprint/2004

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ISBN 978-3-03928-243-2 (Softback)

ISBN 978-3-03928-244-9 (PDF)



This Special Issue covers a wide range of areas—including building orientation, service life, use of photocatalytically active structures and PV facades, implications of transportation system, building types (i.e., high rise, multilevel, commercial, residential), life cycle assessment, and structural engineering—that need to be considered in the environmental impact assessment of buildings, and the chapters include case studies across the globe. Consideration of these strategies would help reduce energy and material consumption, environmental emissions, and waste generation associated with all phases of a building’s life cycle. Chapter 1 demonstrates that green star concrete exhibits the same structural properties as conventional concrete in Australia. Chapter 2 showed that the use of TiO₂ as a photocatalyst on the surface of construction materials with a suitable stable binding agent, such as aggregates, would enable building walls to absorb NO_x from air. This study found that TiO₂ has the potential to reduce ambient concentrations of NO_x from areas where this pollutant becomes concentrated under solar irradiation. Chapter 3 presents the life cycle assessment of architecturally integrated glass–glass photovoltaics in building facades to find the appropriate material composition for a multicolored PV façade offering improved environmental performance. Chapter 4 shows that urban office buildings lacking appropriate orientation experienced indoor overheating. Chapter 5 details four modeling approaches that were implemented to estimate buildings’ response towards load shedding. Chapter 6 covers the life cycle GHG emissions of high-rise residential housing block to discover opportunities for environmental improvement. Chapter 7 discusses an LCA framework that took into account variation in the service life of buildings associated with the use of different materials. Chapter 8 presents a useful data mining algorithm to conduct life cycle assessment in residential developments built on transport systems.

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