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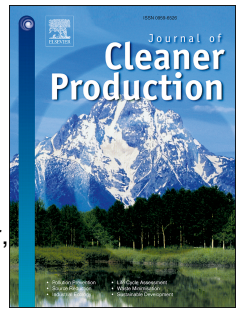

Minimizing greenhouse gas emissions and costs for structures with flat slabs

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Minimizing greenhouse gas emissions and costs for structures with flat slabs.

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Abstract

CO_2 emissions are understood and accepted by our society to be a cause of climate change. And in order to reduce greenhouse gas emissions, their sources must be identified. This study analyzes and examines the emissions and economic costs incurred by flat-slab structures depending on the column layout and slab thickness. This study analyzes and examines the emissions and economic costs incurred by flat-slab structures depending on the column layout and slab thickness. Models of three buildings with different slab thicknesses were used to determine the processes that cause equivalent CO_2 emissions. The materials production stage, specifically the materials that are permanently incorporated into the structure (concrete and steel rebar), represents 85.5% of total emissions. On the other hand, the execution stage engenders the majority of a project's total cost. In the future, research and business efforts should focus on fostering a circular economy in order to reduce greenhouse gas emissions during the process of obtaining reinforcing steel and cement.

Highlights (maximo 85 caracteres incluidos los espacios)

In order to reduce CO_2 emissions, the sources of said emissions must be located.

The cost is an indicator that should always be taken into consideration.

The structural materials production phase generated the greatest environmental impact.

Concrete with high amounts of steel was ruled out due to economic and emission costs.

Slab thickness affects the costs and the environmental impact of a structure.

Keywords

Flat slab, Life Cycle Assessment, Costs, Reinforced Concrete, Global Warming Potential.