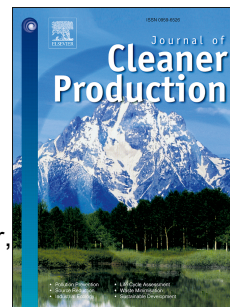


Accepted Manuscript

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Javier Ferreiro-Cabello, Esteban Fraile-Garcia, Eduardo Martinez de Pison Ascacibar, Francisco Javier Martinez de Pison Ascacibar



PII: S0959-6526(16)31049-6

DOI: [10.1016/j.jclepro.2016.07.153](https://doi.org/10.1016/j.jclepro.2016.07.153)

Reference: JCLP 7725

To appear in: *Journal of Cleaner Production*

Received Date: 14 December 2015

Revised Date: 18 July 2016

Accepted Date: 24 July 2016

Please cite this article as: Ferreiro-Cabello J, Fraile-Garcia E, de Pison Ascacibar EM, de Pison Ascacibar FJM, Minimizing greenhouse gas emissions and costs for structures with flat slabs, *Journal of Cleaner Production* (2016), doi: 10.1016/j.jclepro.2016.07.153.

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

Javier Ferreiro-Cabello¹, Esteban Fraile-García¹, Eduardo Martínez de Pison Ascacibar¹, Francisco Javier Martínez de Pison Ascacibar¹.

Javier Ferreiro-Cabello. Email: javier.ferreiro@unirioja.es

Esteban Fraile-García. Email: esteban.fraile@unirioja.es

Eduardo Martínez de Pison Ascacibar. Email: eduardo.mtnezdepison@unirioja.es

Francisco Javier Martínez de Pison Ascacibar. Email: fjmartin@unirioja.es

(1) University of La Rioja (Spain), Department of Mechanical Engineering, Edmans Group.

Corresponding author: Javier Ferreiro-Cabello, University of La Rioja, Department of Mechanical Engineering. C/San José de Calasanz 31, 26004 Logroño (Spain). Email: javier.ferreiro@unirioja.es.

Abstract

CO₂ 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 CO₂ 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 CO₂ 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.

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