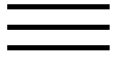


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Life cycle assessment of building materials: Comparative analysis of energy and environmental impacts and evaluation of the eco-efficiency improvement potential

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Abstract

The building industry uses great quantities of raw materials that also involve high energy consumption. Choosing materials with high content in embodied energy entails an initial high level of energy consumption in the building production stage but also determines future energy consumption in order to fulfil heating, ventilation and air conditioning demands.

This paper presents the results of an LCA study comparing the most commonly used building materials with some eco-materials using three different impact categories. The aim is to deepen the knowledge of the energy and environmental specifications of building

...to deepen the knowledge on energy and environmental specifications of building materials, analysing their possibilities for improvement and providing guidelines for materials selection in the eco-design of new buildings and rehabilitation of existing buildings.

The study proves that the impact of construction products can be significantly reduced by promoting the use of the best techniques available and eco-innovation in production plants, substituting the use of finite natural resources for waste generated in other production processes, preferably available locally. This would stimulate competition between manufacturers to launch more eco-efficient products and encourage the use of the Environmental Product Declarations.

This paper has been developed within the framework of the "LoRe-LCA Project" co-financed by the European Commission's Intelligent Energy for Europe Program and the "PSE CICLOPE Project" co-financed by the Spanish Ministry of Science and Technology and the European Regional Development Fund.



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Keywords

LCA; Building materials; Embodied energy; Eco-efficiency

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