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## Environmental implications of the use of agglomerated cork as thermal insulation in buildings

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### Abstract

The market for insulation material is playing a crucial role in Europe's energy transformation, due to its influence on energy consumption in buildings. The introduction of renewable materials for thermal insulation is recent, and little is known so far about its environmental implications. This study analyses the environmental performance of a cork insulation board, made of agglomerated cork from forestry cork wastes, by means of cradle-to-gate Life Cycle Assessment methodology. The results indicate that the use of natural insulation materials does not necessarily imply a reduction of environmental impacts due to manufacturing processes with a low technological development. In this case, the most influential stage is the manufacturing stage, in which the board agglomeration and the cork trituration have the highest impacts. The most influential inputs are both the transport used during the life cycle and the large quantities of electricity and diesel in the manufacturing stage. Some strategies have been identified to reduce the environmental impact, such as promote the acquisition of local raw cork to reduce transportation from the manufacturer, improve the efficiency and productivity of manufacturing processes and improve the product design to help increase its market share. Moreover, the inclusion of biogenic carbon contained in forest-based building materials affects the Global Warming Potential results considerably. However, it is very important to consider how this biogenic carbon is calculated and how the product is managed after its lifetime.

### Keywords

Insulation materials, LCA, cork, renewable material, sustainable construction, building energy

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