

Thermal Solutions for Green Buildings



The BIOBUILD project aims to provide thermal solutions for energy efficiency in buildings through fully bio-based building materials. BIOBUILD is replacing fossil-based materials with new, non-toxic and sustainable

building materials optimized towards thermal energy storage. The project will integrate bio-phase change materials (bioPCMs) into solid wood, wood particles and fibers bound by plant oil resins, lignin or fungal mycelium.

Challenge

The impact of fossil fuels on energy consumption in buildings highlights the urgency to transition to renewable energy sources and sustainable construction practices. In the EU, buildings account for 40% of energy use, 36% of greenhouse emissions and about 95% of the binders used in wood-fibre composites are fossil derived. Fossil fuels such as coal, oil and natural gas have traditionally been the primary sources of energy for heating, cooling and electricity generation in buildings. Non-biobased materials such as bricks, concrete, plastic and glass have high environmental footprints and limited recycling possibilities. Their widespread use contributes significantly to overall energy consumption.

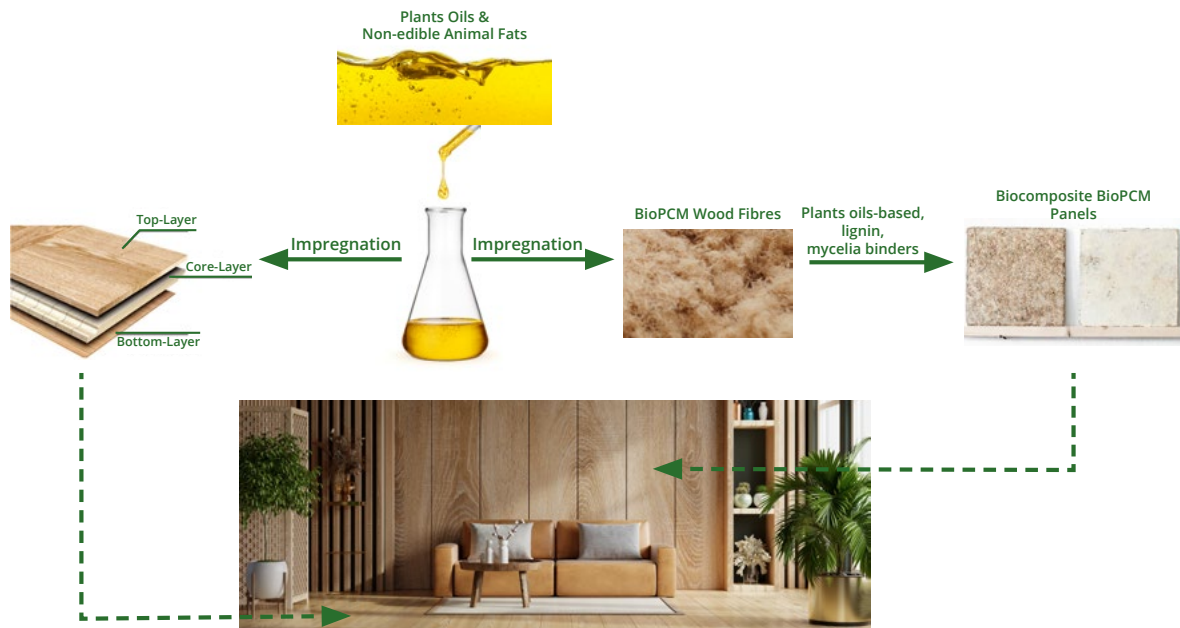


Objectives

- Incorporate bioPCMs into solid wood, recycled wood particles and fibers
- Produce three bio-binders using plant oils resins, lignin and fungal mycelia
- Demonstrate and validate at TRL 7 the BIOBUILD concept
- Use the technologies developed to design and build four houses in Sweden and Spain
- Evaluate energy efficiency of house prototypes with integrated wallboards and flooring
- Employ ex-ante life cycle assessment for each product and explore long-term recyclability



BIOBUILD Concept



Impacts

- Improved thermal comfort of occupants and 20% reduction of energy demand
- Increased use of formaldehyde-free binders and reduced VOCs
- Wider use of bio-based materials and wood-based products in buildings
- Decreased use and dependence on fossil-based products in construction
- Reduced environmental footprint and maximised resource efficiency in construction

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www.bio-build.eu



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