

## **Building with bio-based materials – best practice examples**

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### **ABSTRACT**

The use of timber as a construction material dates back to ancient times. In regions where stone was a rare resource, timber architecture has been developed for centuries, being directly applied for various type of building. Beside wood, also other bio-materials, defined here as materials derived from organic sources, become recently recognized as attractive alternative to many traditional building materials. The push for sustainable buildings and increasing environmental awareness observed nowadays helps to reactivate bio-architecture as interesting alternative to other construction trends.

Progress in efficient wood harvesting, manufacturing, and designing techniques allows sustainable use of renewable resources. Moreover currently developed engineered wood materials, such as glued laminated timber beams and cross-laminated timber panels, allow using wood for building long-span and/or multi-storey buildings. In the same time progresses in the field of wood modification offer innovative products with enhanced properties of natural timbers is observed. These include novel bio-based composite materials, as well as more effective and environmentally friendly protective treatments, e.g. thermal treatment, densification and chemical modifications. The same revolutionary advancement is noticed with surface treatments including innovative coatings, impregnations or integration of developments of nanotechnology for wood protection. Also other fibre-based materials (flax, straw, hemp, wool, jute, ramie, sisal, etc) having low specific weight, good thermal and acoustic properties, become interesting alternative for biodegradable and recyclable building composites.

Unfortunately, very few architects and civil engineers are correctly trained in the aspects of using wood and other bio-materials as a material for building facades. Therefore, an intensive campaign within Bio4ever project is recently conducted in order to demonstrate performance of alternative solutions. The overall goal is to widely promote the bio-based materials and to demonstrate the best examples of architecture that use such sustainable resources. All the know-how developed within this project will be available for direct technology transfer in a form of technical handbook dedicated especially to designers and contractors. This abstract is an invitation to join this initiative and to demonstrate successful use of bio-based materials applied as a building skin.

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