R&D IN WOOD AT THE UPC

2023

UNIVERSITAT POLITÈCNICA DE CATALUNYA BARCELONATECH

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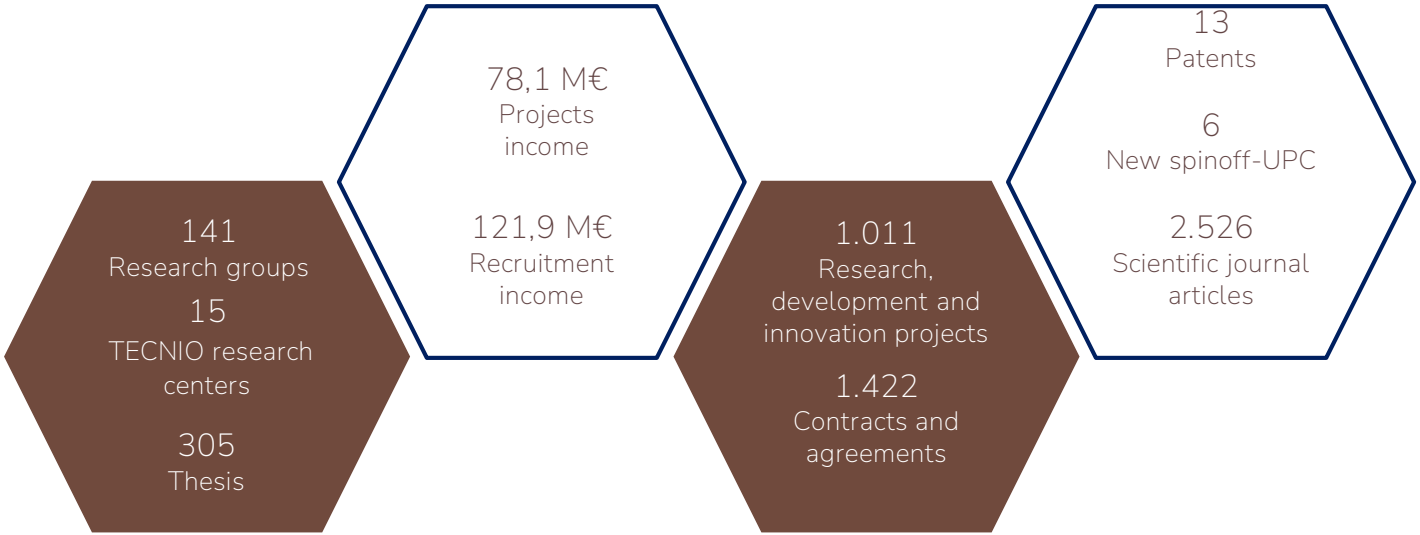
01 THE UPC

The Universitat Politècnica de Catalunya (UPC) is a public institution of research and higher education in the fields of engineering, architecture, sciences and technology, and one of the leading technical universities in Europe.

The UPC participates in the innovation system of Catalonia with projects and contracts for research, development, valorization of knowledge and commercialization of technology.

RESEARCH, DEVELOPMENT AND INNOVATION ACTIVITY AT THE UPC 2022



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02
THE WOOD

WOODEN STRUCTURES

With the development of advanced wood products, wood structures are becoming more common in architecture again.

These structures can be used to build tall and large buildings with a smaller environmental footprint compared to traditional building materials.

SUSTAINABLE DESIGN

Approach that seeks to minimize the environmental impact of buildings through the use of renewable materials, energy efficient systems and passive design strategies.

Wood is a renewable material that can be sustainably harvested and can also be used to create energy efficient and passive solar designs.

Examples of activitiy

Avaluation and development of durable and sustainable construction materials applied to the construction of roads, buildings and civil structures.

Revaluation of waste and by-products from the point of view of sustainability.

Respond to the need for research and pedagogical innovation in the field of architecture.

Study of concrete, metal and mixed, prefabricated and wooden structures, among others.

Improve and systematize architectural rehabilitation and restoration processes.

Urban sustainability, Sustainable Cities and Communities, Housing, Energy Efficiency, Architecture and quality of life improvement of neighbourhoods.

Design action protocols based on the global and sustainable vision of the urban environment.

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03

RESEARCH & INNOVATION

Through the research groups distributed by its Schools and Faculties, the UPC has facilities and resources to provide its own services, in the areas of diagnosis, advice, development, demonstration, training, promotion and support to industry, the public sector and civil society in the promotion and deployment of architectural innovation technologies.

SPECIFIC RESEARCH CENTERS

AGROTECH

Agro-food Technology Research Center

CPSV

Center for Land Policy and Valuations

RESEARCH GROUPS

AD&RM

Architecture, Design: Representation and Modelling

ATEM

Analysis and Technology of Structures and Materials

GICITED

Interdisciplinary Group of Science and Technology in Building

GILDA

Group for Innovation and Logistics Teaching Architecture

QURBIS

Quality of Urban Life: Innovation, Sustainability and Social Engagement

MATCAR

Construction Materials and Roads

REARQ

Rehabilitation and Architectural Restoration

04 UPC EXCELLENCE PROJECTS

In this document are considered excellence projects those in which:

- The scientific process is rigorous and complex with high quality standards.
- They are strategic and tractors.
- They acquire a commitment to both social aspects and to great scientific and socioeconomic impact.
- They have repercussions on the territory.
- They comprise the different entities participating in the quadruple helix, so that the projects remain multidisciplinary.

The UPC excellence projects are financed by various programs, such as the State Plan or Horizon Europe.

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UPC EXCELLENCE PROJECTS

IMIP - Innovative Eco-construction System based on Interlocking Modular Insulation Wood and Cork-based Panels

The main objective of the IMIP project is to design, validate and implement an ecological building system based on natural biological materials to improve energy efficiency in public buildings. One of the main products produced is a BIM plug-in to incorporate the life cycle benefits of the materials used such as carbon stock. This tool will be used mainly by professionals in the building sector and researchers to assess the carbon footprint of buildings.

Thus, the project contributes to the mitigation of climate change by increasing the use of wood and cork products in the construction and rehabilitation of public buildings thanks to its high energy efficiency and carbon storage capacity.

UPC EXCELLENCE PROJECTS

KnoWood - Knowledge Alliance for Sustainable Mid-Rise and Tall Wooden Buildings

The KnoWood project is a project funded by the Erasmus+ program within actions KA2: Cooperation for innovation and the exchange of good practices. Alliances for knowledge.

The project has the participation of 11 entities from 5 different countries: Canada, Denmark, Spain, Lithuania and the United Kingdom and aims to promote the construction of medium and high-rise buildings with wood.

One of the main objectives is to analyze and respond to the training needs of the wood construction sector. For this, training modules will be developed during the project aimed at construction at height with wood.

UPC EXCELLENCE PROJECTS

HybridTim - Design and construction on environmental high performance Hybrid Engineered Timber Buildings

The E+ HybridTim project responds to the great need to solve sustainability problems and create sustainable solutions for design, construction and related sectors to face future environmental challenges. It promotes sustainable and environmentally friendly design and construction of hybrid timber buildings.

Wood is increasingly used in the construction sector, both in the EU and around the world. Experts agree that CO2-absorbing wood is an ideal building material, when grown in sustainably managed forests, to reduce greenhouse gas emissions. The use of engineered wood combines a potential for prefabrication and rapid construction with lower embodied energy and a potential delay in carbon emissions over the life of the building.

UPC EXCELLENCE PROJECTS

BioSAFE - Bio-sustainable solutions for the acoustic and fire improvement of building envelopes

The BioSAFE project aims to affect the building's envelopes, mainly facades, promoting designs with sustainability, comfort and safety criteria. This involves the use of materials based on renewable resources (wood, bamboo and agricultural by-products), taking into account two important aspects: their safety in case of fire and their acoustic performance.

This proposal is, to a large extent, a continuation of the SBES project - Sustainable solutions for building envelopes (BIA2017-88401-R). However, the present project focuses on new and original objectives: the improvement of both acoustic and fire performance and the development of natural flame retardant products.

UPC EXCELLENCE PROJECTS

OTHER COMPETITIVE PROJECTS:

- RegBCN - Regenerate Barcelona.
- LIGNOMAD - Network for the promotion of wood and other lignocellulosic materials in the construction sector.
- MEDULA - Use of plant pulp to improve the hygrothermal behavior of buildings.
- COST - Fire safe use bio-based building products.

05

EDUCATION

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EDUCATION – BACHELOR'S DEGREES

ARCHITECTURE, URBANISM AND BUILDING

- Bachelor's degree in Architectural Technology and Building Construction

Barcelona School of Building Construction (EPSEB)

- Bachelor's Degree in Architecture Studies

Barcelona School of Architecture (ETSAB)

- Bachelor's Degree in Architecture Studies

Vallès School of Architecture (ETSAV)

- Bachelor's Degree in Landscape Architecture

Barcelona School of Architecture (ETSAB)

Barcelona School of Agri-Food and Biosystems Engineering (EEABB)

More information about UPC degrees

EDUCATION –
MASTER‘S DEGREES

ARCHITECTURE, URBANISM AND BUILDING

- Master's degree in Architecture

Barcelona School of Architecture (ETSAB)

Vallés School of Architecture (ETSAV)

- Master's degree in Advanced Building Construction

Barcelona School of Building Construction (EPSEB)

- Master's degree in Diagnosis and Intervention Techniques in Building Construction

Barcelona School of Building Construction (EPSEB)

- Master's degree in Advanced Studies in Architecture-Barcelona (MBArch)

Barcelona School of Architecture (ETSAB)

EDUCATION – MASTER'S DEGREES

ARCHITECTURE, URBANISM AND BUILDING

- Master's degree in Building Construction Management

Barcelona School of Building Construction (EPSEB)

- Master's degree in Landscape Architecture (MBLandArch)

Barcelona School of Agricultural and Biosystems Engineering (EEABB)

Barcelona Technical School of Architecture (ETSAB)

- Master's degree in Advanced Studies in Design-Barcelona (MBDesign)

Vilanova i la Geltrú School of Engineering (EPSEVG)

Terrassa School of Industrial, Aerospace and Audiovisual Engineering (ESEIAAT)

Barcelona School of Architecture (ETSAB)

RESEARCH AND INNOVATION SUPPORT SERVICE

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Research, Development and Innovation UPC

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