


ANNUAL
REPORT
2021

We generate knowledge
to drive the big changes
and to address the big challenges
that we face as part of society



Technology Center (CIT UPC)

Edifici Omega (planta 0)

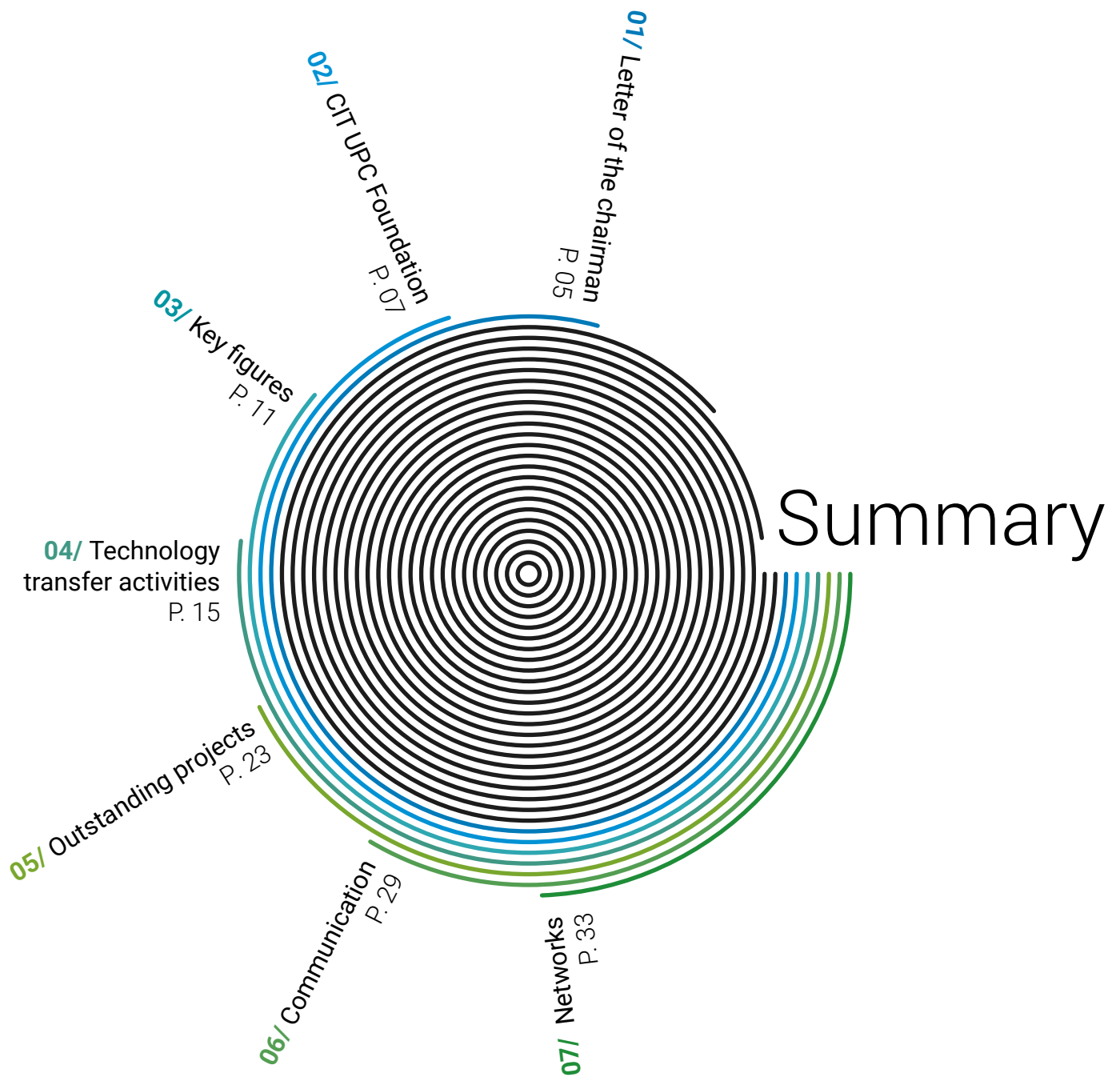
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Legal deposit: DL B 26119 - 2014





Letter from the chairman



Prof. Daniel Crespo

RECTOR OF THE UPC
AND CHAIRMAN OF CIT UPC

2021 has been a year of recovery in which we have gradually returned to face-to-face activity. Although health conditions have improved, returning to pre-pandemic economic conditions is proving more difficult.

Despite the uncertainties we faced in 2021, the Universitat Politècnica de Catalunya-BarcelonaTech has continued to work on putting all of its knowledge at the service of the productive sector and society in general. We continue to do this through the Innovation and Technology Centre (CIT UPC), which facilitates the transfer of knowledge from the public research system to the productive fabric to generate an economic and social impact.

We strive to build relationships with companies and entities and to weave the ties that provide long and enriching collaborations that are of mutual benefit.

In a society that is increasingly conditioned by technological challenges, we need the solutions that can only come from the highly competitive research that is informed by the knowledge and rigour of UPC researchers.

We are unambiguously committed to innovation as a driver of change and progress and believe that our university has a central role in achieving this.



CIT UPC foundation

The UPC and technology transfer

The Universitat Politècnica de Catalunya · BarcelonaTech (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.

Just after its foundation, the UPC made an institutional commitment to technology transfer and subsequently to spin-offs and patents. As a result, the UPC made a strategic commitment to founding the UPC Technology Centre, following in the footsteps of the world's top technical universities.

This commitment over time explains why the UPC is the leading university in Spain in terms of knowledge transfer according to the Ranking CYD 2022, and is among the 100 best universities in the world and the top university in Spain and Latin America in Engineering, and ranked 15th in the world, 4th in Europe and 1st in Spain and Latin America in Architecture, according to the Scimago Institutions Rankings (SIR 2022).

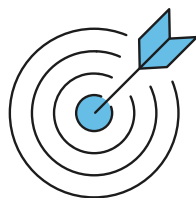
CIT UPC'S objectives

CIT UPC is a foundation that works with the UPC research and technology transfer centres. They carry out excellent research and, as a result, they are highly active in technology transfer to companies and seek to provide technology solutions.

Building on this situation and these strengths, the UPC aims to **contribute to the economic and social growth of Catalonia through knowledge transfer**, which is the **bridge between science in general and companies' technology needs**. Given the available critical mass, and the capacity and range of innovative knowledge provided by the UPC research centres, we can provide solutions to complex technical problems that require a cross-cutting approach.

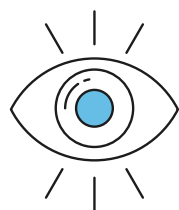
We work to be a key player on the map of technology centres in southern Europe in terms of research, technology and knowledge-based transfer, that is, innovation. A technology centre that can do this job is clearly one that can provide the greatest added value and help to increase the competitiveness of the companies that put their trust in it. We are committed to bringing more and better technology to the market by transforming knowledge into marketable technologies.

Mission



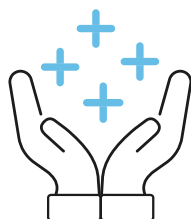
CIT UPC helps to build business competitiveness through the generation, development and application of exceptional technological knowledge to business. This process is carried out in the UPC's research and development of technology of the UPC.

Visión



CIT UPC aims to become a global leader in research excellence, technology transfer and innovation, and in technological areas that have an impact on companies and economic growth.

Values



CIT UPC bases its activity on efficiency and sustainability in order to bolster its credibility and trustworthiness, while at the same time meeting the needs and expectations of its various stakeholders and complying with current regulations, in particular those related to environmental protection and occupational health and safety.

The collective values of CIT UPC include the following:

- Commitment to our clients.
- Participation and cooperation.
- Independence, prestige and social outreach.
- Sustainable development.
- Commitment to health and safety.

Organisation

Board

CHAIRMAIN

Dr. Daniel Crespo Artiaga

Rector of the Universitat
Politécnica de Catalunya (UPC)

DEPUTY PRESIDENT

Sra. Montserrat Guàrdia Güell

Chair of the Board of Trustees
of the Universitat Politècnica de
Catalunya (UPC)

SECRETARY (nonboard member)

Sra. Anna Serra

Secretary of the Board of
Trustees of the Universitat
Politécnica de Catalunya (UPC)

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Vice-rector for research
of the UPC

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Research Staff Policy of the UPC

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Director of CD6 UPC

Mr. Carles Sumarroca Claverol

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Trustees of the UPC, COMSA
Corporación de Infraestructuras

Mr. David Marin Casanovas

Member of the Board of Trustees
of the UPC and Inaccés CEO

Mr. Albert Gallart Pasias

Director of Grupo Pulso

Mr. Xavier Marcet i Gisbert

President of Lead To Change

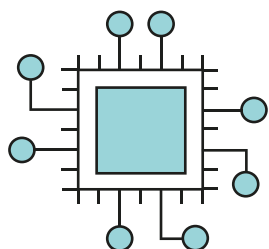
Mr. Miquel Martí Pérez

CEO of Tech Barcelona

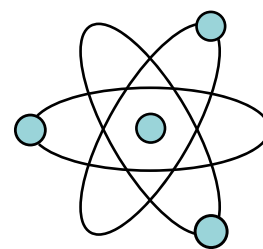


Key figures

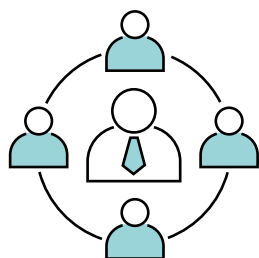
2021 Technology transfer figures



The CIT UPC Foundation contributes to the general benefit of society and especially to improving the competitiveness of the production sector. In 2021, we contacted over **450 companies and entities** to inform them about the technologies that are developed at the UPC.



The CIT UPC Foundation promotes applied research as well as cooperation and internal coordination between **UPC groups and research centres**. In 2021, we worked with over **70 companies** to carry out research activities and transfer R+D results to them.

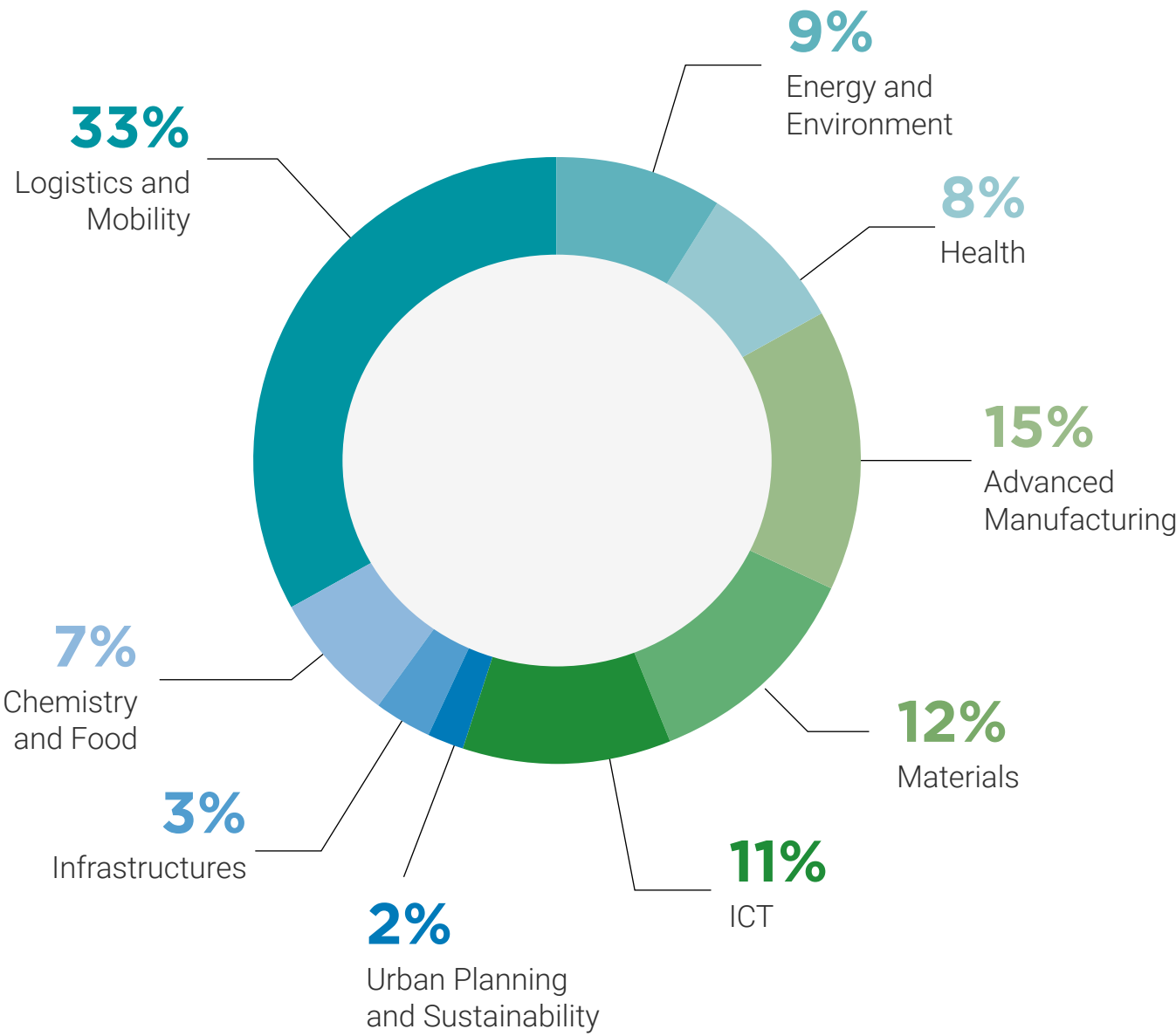


The CIT UPC Foundation has held **over 250 executive meetings** to meet the technology needs of companies and entities that have required them to provide a comprehensive, multidisciplinary technology service and thus support business innovation.



The CIT UPC Foundation has contributed to **increasing the social recognition of the function of technology transfer and the appreciation** of research centres and the UPC, based on the promotion of projects of technological excellence.

Technological origin of the projects promoted by CIT UPC

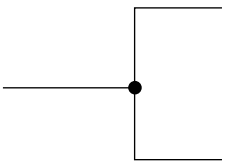


2021 figures of the scientific activity and research of the UPC



72.73 M

Income of the Universitat Politècnica de Catalunya for projects



68%

Competitive

31%

Non-competitive



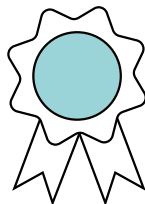
859

New agreements and competitive projects



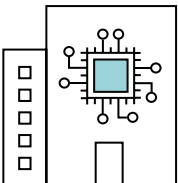
209

Research groups



19

Registered patents



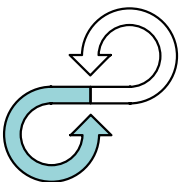
13

Technology-based companies created



60%

Of teaching and research staff are PhD holders



2,998

Companies and entities with collaboration agreements



Technology
transfer activities

- TECHNOLOGY CONFERENCES
- DISSEMINATION AND PROMOTION ACTIVITIES
- OTHER TECHNOLOGY TRANSFER ACTIVITIES OF THE UPC
- CLUSTERS AND ASSOCIATIONS
- SPECIFIC PROJECTS
- FAIRS AND CONGRESSES



22/01/2021
DISSEMINATION AND PROMOTION ACTIVITIES
Collaboration agreement between CIT UPC and Seastainable Ventures

January 2021

15/01/2021
OTHER TECHNOLOGY TRANSFER ACTIVITIES OF THE UPC
The Sant Joan de Déu Research Institute, in which CREB UPC participates, recognised as a CERCA centre

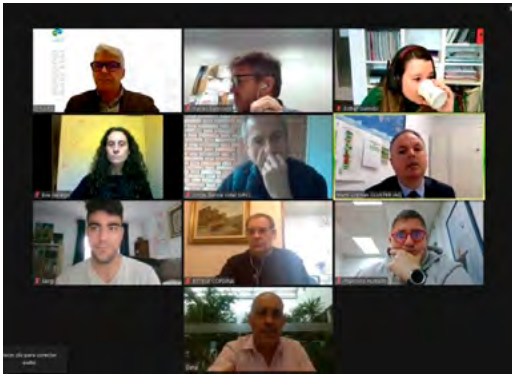


27/01/2021
TECHNOLOGY CONFERENCES
Webinar on interior air quality (IAQ)





24/02/2021
CLUSTERS AND ASSOCIATIONS
CIT UPC, new member of the
Audiovisual Cluster



21/04/2021
TECHNOLOGY CONFERENCES
UPC Technology in the Webinar
on “Technologies to improve indoor
air quality. People’s health and
wellbeing

February 2021

March 2021

April 2021

May 2021

04/ Technology transfer activities



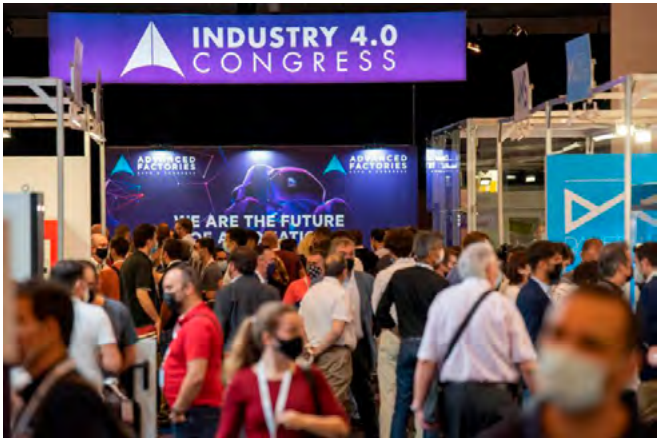
27/05/2021
TECHNOLOGY CONFERENCES
A virtual visit to universities and research and knowledge centres



15/06/2021
TECHNOLOGY CONFERENCES
CIT UPC participates in the Cafè de la Recerca edition on research, development and innovation networks

June 2021

8-10/06/2021
FAIRS AND CONGRESSES
The UPC at Advanced Factories 2021





28/06/2021 - 01/07/2021
FAIRS AND CONGRESSES
The UPC at MWC Barcelona 2021

July 2021

14/07/2021
FAIRS AND CONGRESSES
Open Innovation Forum 2021:
where business innovation challenges
find solutions

August 2021



04/ Technology transfer activities



14-17/09/2021
FAIRS AND CONGRESSES
CIT UPC, Institutional Partner
of EXPOQUIMIA 2021



22/09/2021
SPECIFIC PROJECTS
ARIADNA at the International
Mobility Congress 2021

September 2021

22/09/2021
SPECIFIC PROJECTS
The future of sustainable food,
under debate at an event organised by
the UPC and Barcelona Metropolitan
Area on 22 September



October 2021



08/11/2021
**OTRAS ACTIVIDADES DE TRANSFERENCIA
TECNOLÓGICA DE LA UPC**

La UPC, the TECNIO Association
for promoting technology transfer
in Catalonia



16-18/11/2021
FAIRS AND CONGRESSES

The UPC, at the Smart City
Expo World Congress 2021

November 2021

13-16/11/2021
SPECIFIC PROJECTS

CIT UPC, partner of the Sixth European
Blockchain Convention 2021



04/ Technology transfer activities



23/11/2021
CLUSTERS AND ASSOCIATIONS
CIT UPC at the CEQUIP meeting
of CIM UPC



25/11/2021
CLUSTERS AND ASSOCIATIONS
CIT UPC at the MAV DAY

December 2021



Outstanding projects

05/ Outstanding projects



HEALTH

Serious games to improve the training of perfusionists in heart surgery



HEALTH

NICVA: A non-invasive device for fast cardiovascular condition assessment



HEALTH

A new system for **purging serum therapy equipment** that avoids intravenous infra-medication



ICT

WINTER: Interference management in communications and information processing 5g networks



ICT

VIDA: smart ventilation to detect the level of purification of indoor air



ICT

An innovative **open data platform** for Barcelona

05/ Outstanding projects



ENERGY AND ENVIRONMENT

An innovative technology to **take advantage of the surplus energy** generated by solar panels



ENERGY AND ENVIRONMENT

COREWIND: improving the performance of floating wind technology in the open sea



ENERGY AND ENVIRONMENT

A **new generation of batteries** to move towards greener mobility



ADVANCED MANUFACTURING

CaRo: Core capabilities for co-workers Robots



ADVANCED MANUFACTURING

AVINT: machining strategies and prediction of roughness for optimal surface integrity



ADVANCED MANUFACTURING

SECUTIL: Security and cybersecurity solutions to protect critical infrastructure

05/ Outstanding projects



CHEMISTRY AND FOOD

Improved efficiency in **pest control** through photonic technology



CHEMISTRY AND FOOD

Cooperative robots developed to harvest dessert grapes



CHEMISTRY AND FOOD

Coppereplace: reduce the application of copper to vineyards and its environmental impact



MATERIALS

Completion of the PaperChain:
A model of circular economy to transform paper waste into secondary raw materials



MATERIALS

New tests and computer simulation methodologies for **electric vehicle chassis weight reduction**



MATERIALS

New cementitious neuromorphic materials for **civil engineering applications**



INFRASTRUCTURES

UPC works with digital twins
to make the construction industry
more efficient, more reliable
and safer



INFRASTRUCTURES

A new power generation system
using **piezoelectric** elements
integrated into roads



INFRASTRUCTURES

A new management
model integrated into the water
resources of the Besòs



URBANISM AND SUSTAINABILITY

Five case studies in the
Ciutat Vella neighbourhood on
urban reuse and the promotion of
innovative production models



URBANISM AND SUSTAINABILITY

Cartography of Barcelona during
the period of the first state of
alarm due to the pandemic



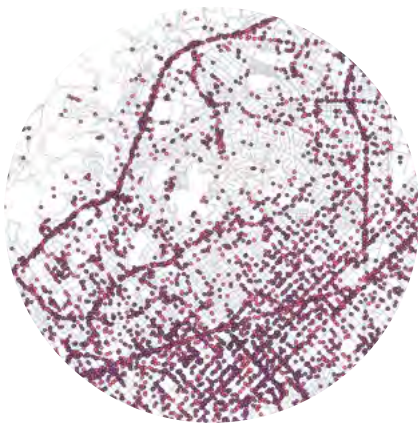
URBANISM AND SUSTAINABILITY

Modelling of mobility in
Barcelona Metropolitan Region to
assess the urban master plan



LOGISTICS AND MOBILITY

SYN-AIR: Datasharing in multimodal D2D (door to door) services for transport service providers



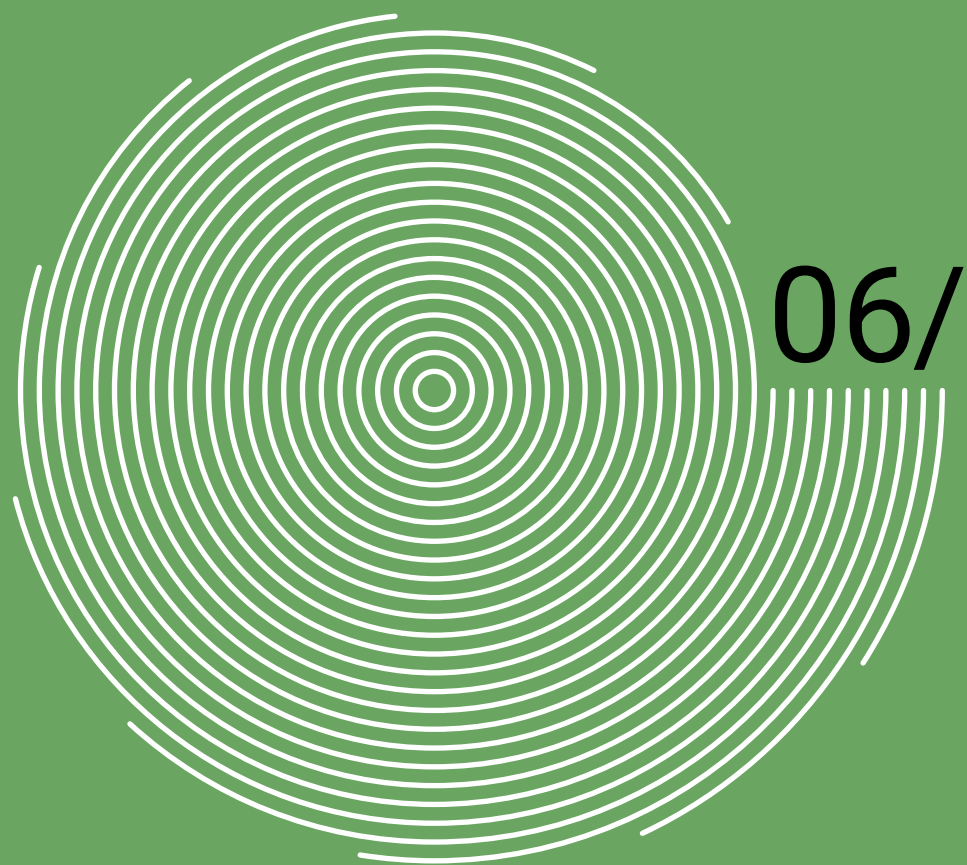
LOGISTICS AND MOBILITY

Mobidata: A new paradigm to determine patterns of mobility in the city of Barcelona



LOGISTICS AND MOBILITY

A SEAT-UPC Chair designs **electric charging stations** for urban micromobility



Communication

Publications

To achieve results from our scientific and technological assets, it is vital for society to know about them and essential to establish good communication with companies, entities and business organizations. With this objective, we use various channels to inform about projects developed as examples of university-company collaboration and the results and developments achieved.

Newsletter

We publish a bulletin of monthly news in three languages.

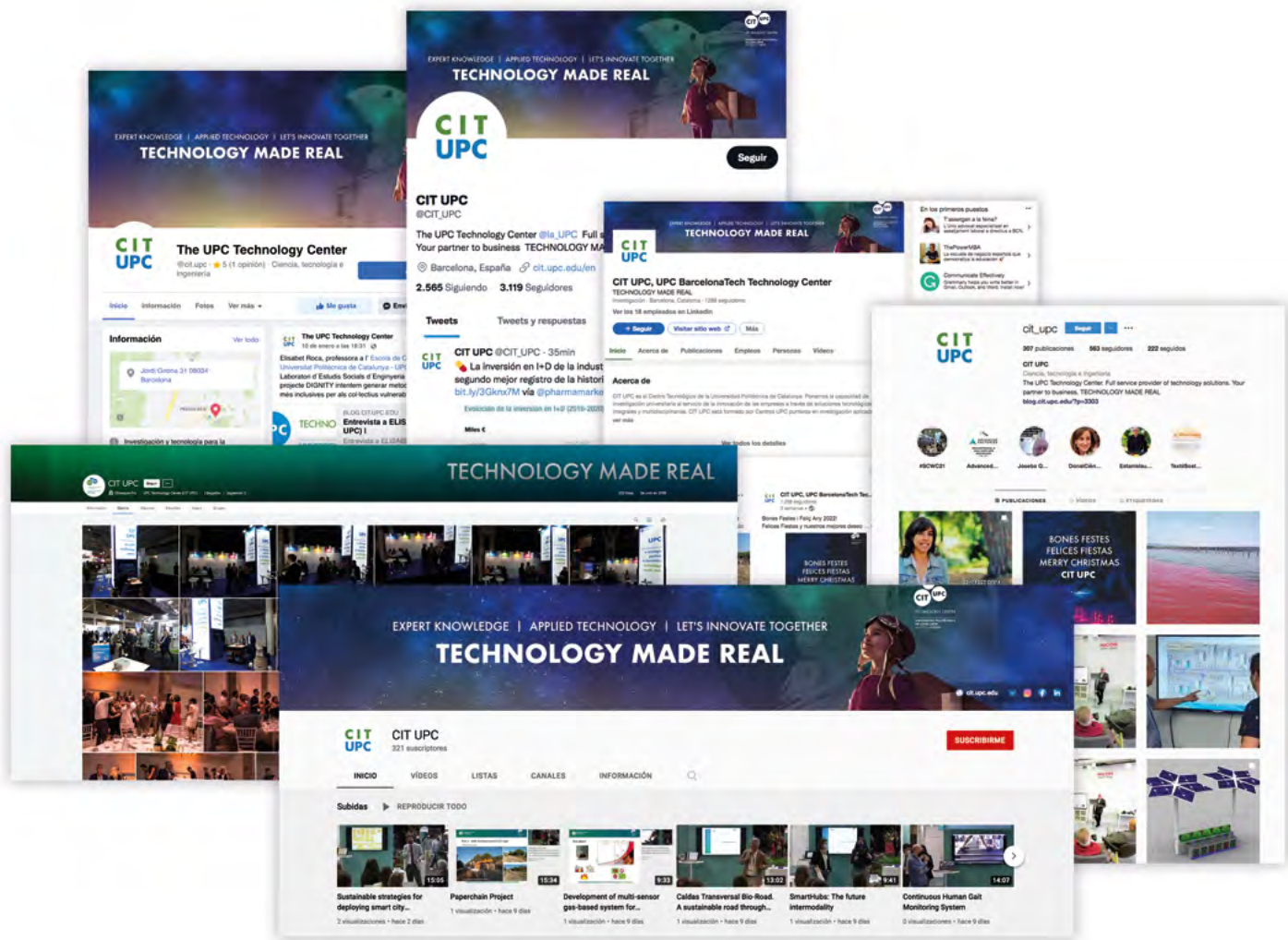


Blog

We publish a technology blog to share experiences and provide information on knowledge, technology and innovation. The blog is open to participation and aims to bring companies and the University into contact.

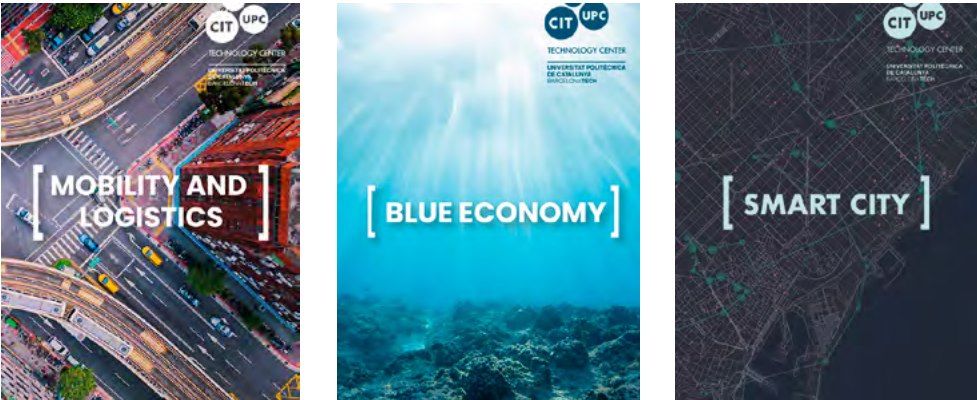


Social media

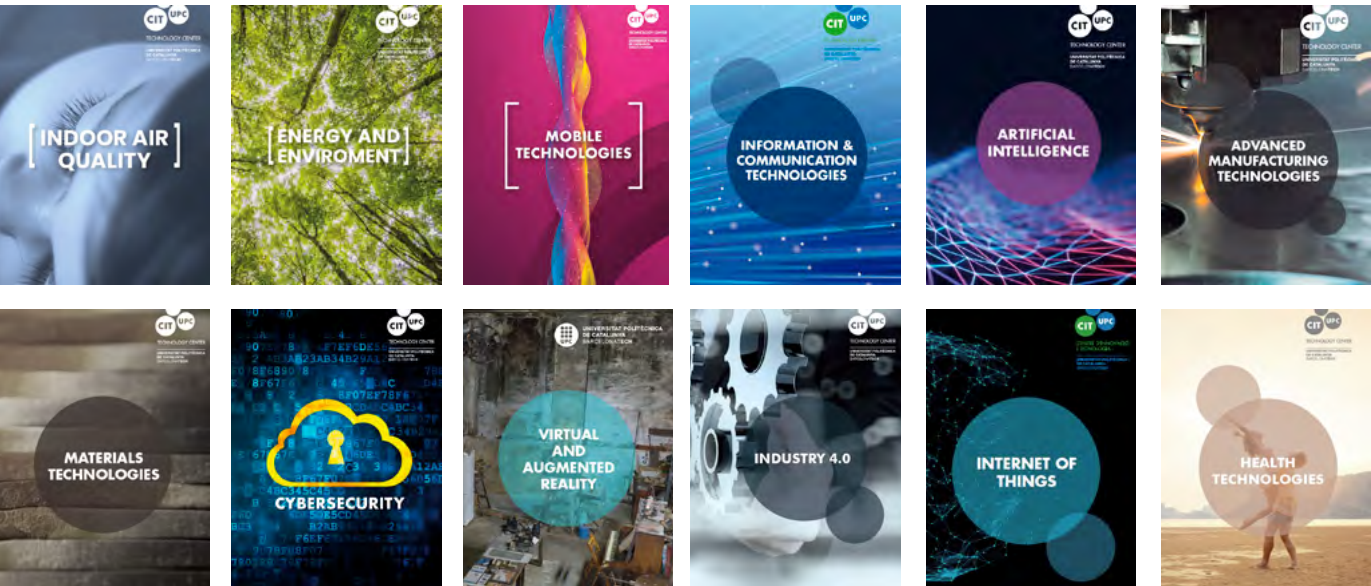


Cross-cutting technological approach

2021 editions



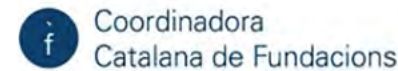
Other editions





Networks

Organisations



Clusters



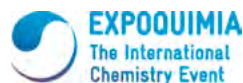
Technical coordination of



We are a partner of



We are a partner of the following events

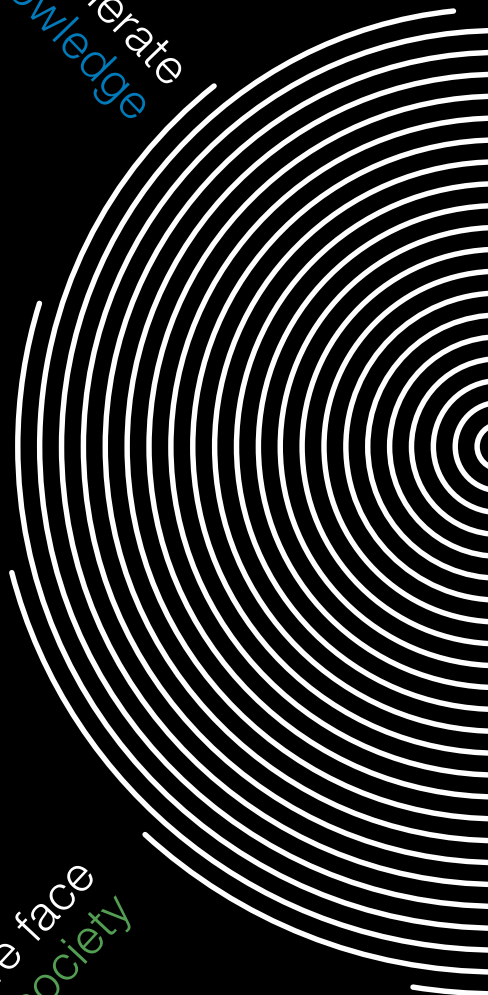


We generate
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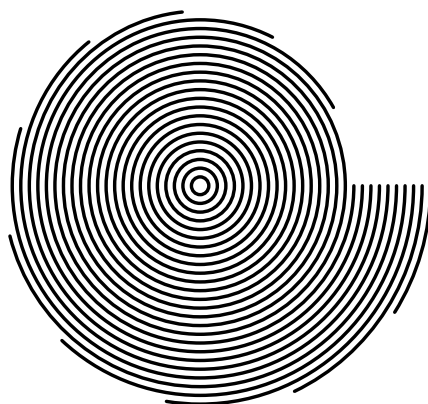
and to address
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Technology made real



Technology made real

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Generalitat de Catalunya
Departament de Recerca i Universitats
Secretaria General