



UNIVERSITAT POLITÈCNICA
DE CATALUNYA
BARCELONATECH

[ENVIRONMENT]

RESEARCH, DEVELOPMENT & INNOVATION AT THE UNIVERSITAT POLITÈCNICA DE CATALUNYA - BARCELONATECH (UPC)

The Universitat Politècnica de Catalunya - BarcelonaTech (UPC) specialises in the fields of engineering, architecture, science, and technology, including technologies applied to the environment. In this field, the main focus areas are:

Recycling, upcycling, treatment

- Climate change mitigation
- Gas emissions and air pollution control
- Plastics
- Organic
- Electronics
- Other

Ecosystem preservation

- Terrestrial ecosystems
- Wastewater treatment
- Urban ecosystem
- Drinking water
- Marine and coastal ecosystems
- Environmental impact and technological risk

As a result of the UPC's recognised research track record in its areas of specialisation, we can offer a wide range of services:

- R&D technology transfer projects
- Consortia for national and Horizon Europe projects
- Patents
- Technology assessment
- Specialised facilities

The UPC is a leading university in Spain in volume of research and technology transfer to companies, and has become one of the major hubs of knowledge in Southern Europe.

[RECYCLING, UPCYCLING, TREATMENT]

CLIMATE CHANGE MITIGATION

- Ecotechnologies and nature-based solutions
- Models and proposals for climate change mitigation
- Multilateral governance
- Global carbon budget and climate justice
- Advice on the Paris Agreement
- Life cycle assessment
- Green and circular economy



GAS EMISSIONS AND AIR POLLUTION CONTROL

- Gas sensors and contaminant detection
- Modelling odor episodes and atmospheric quality
- Industrial emission assessment tools, systems and models
- Modelling, diagnosis and control of sources of air pollution
- Characterisation and treatment of gaseous emissions
- Removal, filtration and/or valuation of air pollutants and gases (NH₃, H₂S, CO₂, CO, VOCs and cinder, amongst others)



PLASTICS

- Recycling and recovery of plastic materials
- Plastic recycling by means of hyperspectral techniques
- Conversion of plastic waste (monomers) into new plastics
- Development in bioplastics and biocomposites

ORGANIC

- Characterization and composting of organic waste for agricultural recovery
- Valorization of incineration waste
- Recovery of bio-active components from food and agrowaste
- Sustainable management of cork waste generated in the cork industry
- Development of bio or synthetic organic waste to obtain new materials, for use in the construction industry, transport and packaging
- (Bio) processes of transformation of waste and organic by-products

[RECYCLING, UPCYCLING, TREATMENT]

ELECTRONICS

- Circular economy of digital devices
- eReuse: reuse of electronics to ensure final recycling
- Bioleaching of low-rank ores and e-waste for valuable metals recovery
- Research on the traceability of digital devices across their lifespan



OTHER

- Co-gasification and pyrolysis of residual material (including municipal solid waste and forest waste)
- Construction and demolition waste management and recovery
- Mining, urban and industrial waste recovery
- Management, compaction and recovery of the waste process



[ECOSYSTEM PRESERVATION]

TERRESTRIAL ECOSYSTEMS

- Application technique of phytosanitary products to reduce the risk of environmental pollution
- Application technique for organic fertilizers to reduce environmental impact
- Efficiency in composting systems and optimization of agricultural productivity. Sustainable agriculture
- Studies to evaluate risk to human health and ecosystems
- Landslide risk management
- Ecosystem services and sustainable resource management



[ECOSYSTEM PRESERVATION]

WASTEWATER TREATMENT

- Real-time control of sewage systems and wastewater treatment plants
- Natural low-cost bioprocesses for wastewater and sludge treatment
- Design of constructed wetlands for wastewater treatment
- Numerical simulation of bioprocesses to remove contaminants from wastewater
- Life cycle assessment and economic evaluation of products and technologies for wastewater treatment, sludge management and biogas production
- Use of cork to clean wastewater and produce electricity
- Urban and industrial wastewater treatments and related technologies

URBAN ECOSYSTEM

- Urban contaminants and the environment
- Green building architecture and materials
- Noise pollution

DRINKING WATER

- Real-time monitoring and operational control of drinking water systems
- Improvement in the efficiency of water use, energy consumption, water loss minimization and water quality
- Modelling and simulation of drinking water networks
- Optimisation of water transport and distribution networks



MARINE AND COASTAL ECOSYSTEMS

- Engineering and physical oceanography
- Port and coastal structures. Coastal zone management
- Morphodynamics and coastal processes
- Maritime research and experimentation wave flume
- Data acquisition system design and automation of marine system measurements
- Development of multifunctional sensors for in-situ monitoring of the marine environment
- Development of mobile and fixed ocean observing platforms

ENVIRONMENTAL IMPACT AND TECHNOLOGICAL RISK

- Risk analysis in the process industry
- Wildland fires monitoring and prediction
- Compartment fires modelling
- Floods and flash-floods, forecasting and derived impact
- Ecotoxicology

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Departament de Recerca i Universitats
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