



CENER

NATIONAL RENEWABLE
ENERGY CENTRE

CENER – BIO2C

CENER BIO2C

The **Biorefinery and Bioenergy Centre (BIO2C)** of CENER, the National Renewable Energy Centre of Spain is a **semi-industrial pilot scale test facility** able to develop production processes for bioproducts, solid biofuels, advanced liquid or gaseous biofuels, as well as biorefinery concepts integrating different valorization routes, as an intermediate step between laboratory and the industrial scale-up of these technologies.

Supporting market uptake of biobased industries by development, integration, scale-up and demonstration of sustainable processes for the manufacture of biobased products and advanced biofuels. The BIO2C provides modular test facilities and a highly qualified staff for scaling up whole value chain based on biorefinery concepts and cascading valorization principle, as an intermediate step between laboratory and industrial implementation.

FIELDS OF ACTIVITY

Very flexible in relation to the feedstock and the target bioproducts, the BIO2C offers the following **kind of services**:

- Biomass characterization
- Lab testing and analysis
- Product and process development
- Process upscaling and validation at pilot and demo scales
- Product batches production and validation
- Tailor-made research contracts
- Techno-economic feasibility studies
- Sustainability and lifecycle analysis



BIOCHEMICAL UNIT

Thermochemical Pretreatment
Enzymatic Hydrolysis
Fermentation
Downstream



PRETREATMENT UNIT

Chipping
Drying
Torrefaction
Pelletization



GASIFICATION

Gasification Island
Thermal Oxidizer
Flue Gases Treatment



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ADItch

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RENEWABLE
CARBON



COMPANIES

www.renewable-carbon.eu/companies



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SUPPORTING THE WHOLE INDUSTRY CHAIN AND INSTITUTIONS

THERMOCHEMICAL PROCESSES



- Process development:
 - **Torrefaction** pilot
 - **Pelletizing** pilot & demo
 - **Gasification** pilot & demo
 - **Pyrolysis** pilot & demo
 - **Lignin depolymerization** processes lab & pilot
 - **Hydrothermal Liquefaction** lab & pilot plant
- Solid Biofuels **Characterization** lab
- Simulation of **Ash** behavior

SUSTAINABILITY & TECHNOECONOMIC ASSESSMENTS



- Ad-hoc **Sustainability** services for:
 - Certification systems development
 - LCA and GHG assessments
- **Techno-economic** evaluation:
 - Process **flow** diagram
 - **Mass** and **energy** balances
 - **CAPEX** and **OPEX**
 - **Operating account**: LPC, TIR, PAY-BACK

BIOPROCESSES



- Process development:
 - **Enzymatic** and **fermentative** processes from lab to demo
 - **Fractionation** of lignocellulosic biomass
 - **Gas fermentation** lab & pilot
 - **Separation** and **purification** technologies lab & pilot
- Feedstock **Characterization** lab

CONTACT

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