

## EnergyLab Description

EnergyLab is a private technology centre specialised in energy efficiency and sustainability. It is a non-profit private entity set up on 2008 as an initiative of the industry and the Regional Government.

EnergyLab identifies, develops and promotes technologies, processes, products and consumption behaviours able to contribute to the improvement of the energy efficiency and sustainability through its applications in industry, domestic products, mobility and buildings.



In 2014, EnergyLab was recognised as National Technological Centre by the Ministry of Economy and Competitiveness and it is member of ATIGA (Galician Technological Alliance) together with other five Galician centres.

EnergyLab's staff is highly qualified, with large experience on international projects development, and a 38% rate of PhDs.



## Introduction

The bioenergy area is focused on technological development of low carbon energy; including renewable sources such as biogas, biomass, geothermal, marine energy, etc. with the aim of a secure, efficient and sustainable energy supply.



## Main Areas of Work

The areas of work in the bioenergy area are aligned to biogas production, biomass and sustainability assessments.

- Characterization of organic wastes and biodegradability assessments.
- Determination of biogas and biomass potentials, including waste/plant localizations with GIS tools.
- Biogas production optimization: new digesters' designs, co-digestion, etc.
- Biogas up-grading with low cost techniques.
- Gases and particles emissions analysis in domestic biomass boilers.
- CFD modelling related to biogas and biomass gasification and combustion.
- Energy from the sea: tidal, wave prototypes.
- Environmental impact analysis with Life Cycle Assessment (LCA).
- CAPEX and OPEX determination with Life Cycle Cost (LCC).



## R&D Technical Capabilities

### Facilities and equipment

EnergyLab has specialized scientific and technological equipment, such as:

- Biogas production system by fermentation (batch and CSTR).
- Biogas upgrading system:
  - Equipment for chemical absorption.
  - Hydrogenotrophic reactor for biological methanation.
  - Micro-algae photobioreactor.
  - Advanced carbonatation system.
- Organic Rankine Cycle technology



### Technological skills

- Simulation of biogas production, biomass combustion and gasification.
- Technical and economic validation, feasibility studies of renewable energy sources and biogas/biomass projects.
- Conceptual and basic engineering of biogas/biomass equipment & facilities.
- Optimization of biogas digesters, co-digestion feeding and operation procedures.
- New biomass fuels for energy production.
- Biogas/biomass projects management.

## R&D Projects

- Sustainable Mobility Joint Research Unit: Technological development of the use of natural gas and biomethane in maritime and agrarian mobility .
- Renewable Gas Joint Research Unit for increasing the understanding of biomethane production processes for wastewater treatment plants in the urban and food sectors.



- Digester 2.0: FORTISSIMO2 project for the optimisation of anaerobic digestion process for biogas generation.
- PLANTADAC project: Development of a low cost anaerobic reactor suitable for Galician middle-sized cattle farms.
- Design, construction and monitoring of a biogas plant from beef cattle residues.
- Biomasa AP (POCTEP Project): improvement of biomass research capacities.

## Research Lines of Interest

- Low cost biogas and syngas upgrading systems.
- Novel residual biomass gasification for syngas production.
- Micro-algae biogas upgrading and added value by-products generation.
- Additives for new biomass fuels production and novel technologies for biomass energy valorization.

