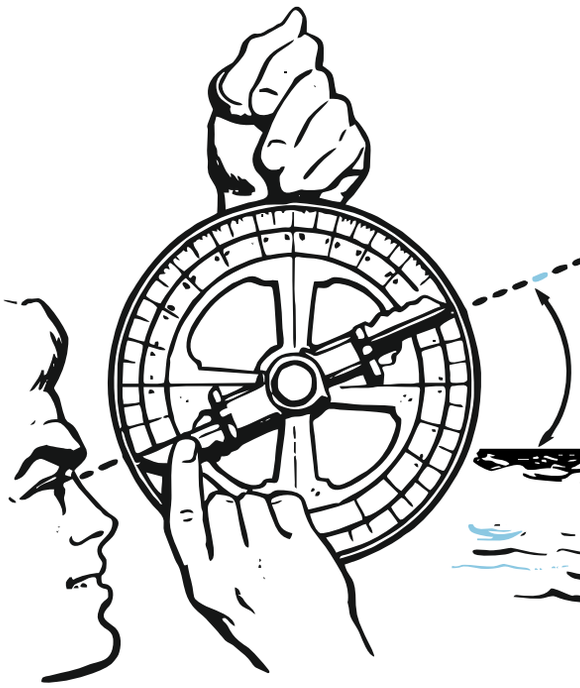


Łukasiewicz
Institute of Heavy
Organic Synthesis
BLACHOWNIA

HORIZON europe

TOPIC ID:
HORIZON-JU-CBE-2025-IAFlag-01

Urban-industrial symbiosis for bio-waste valorisation

Innovative Fertilizers and Sustainable Fuels Through Urban-Industrial Symbiosis

Type of project: IAFlag

Call opening date: 4 April 2025 Call deadline: 17 September 2025

www.icso.lukasiewicz.gov.pl

ABOUT US

Since early 2000s Łukasiewicz - ICSO "Blachownia" has been working on various technologies to replace fossil-based chemicals with bio-based or waste-based alternatives. The feedstocks that we are working on include plant oils, wood oil, starch, bio-based alcohols, lignin, cellulose, and organic acids. Our offer can be divided into the following segments: fuels, specialty chemicals, polymers, solvents, cosmetic additives and waxes.

Łukasiewicz - ICSO "Blachownia" offers the cooperation in area of:

- Thermal and catalytic conversion processes
- Advanced separation and purification
- Upscaling from lab to pilot scale
- Design and construction of tailor-made pilot plants
- Analytical methods and online process control
- Sorbent-based wastewater treatment
- Development of slow-release, coated fertilizers
- Biodegradation and toxicity tests.

OUR IDEA

Production of Coated Fertilizers from Nitrogen-Rich Streams

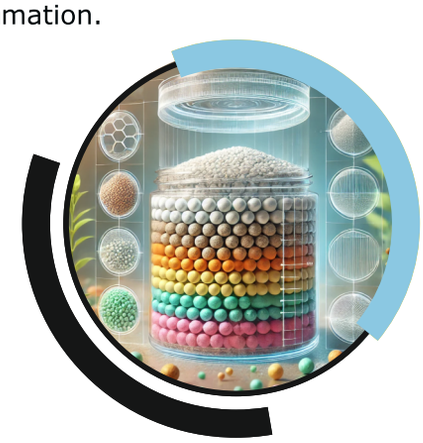
We aim to convert nitrogen-rich side streams (e.g., residues from industrial or agricultural processes) into advanced, slow-release fertilizers. By integrating physical pre-treatment and drying processes, it is possible to create a valuable mineral-organic fertilizers, which allow to reduce the carbon footprint. This approach helps close the loop on nitrogen usage, turning waste into an efficient, high-value agricultural input.

Utilization of Post-Fermentation Gases in Chemical Syntheses

We explore catalytic pathways to convert carbon dioxide, methane, and other post-fermentation gases into syngas or targeted intermediates for fuels and specialty chemicals. This strategy not only reduces greenhouse gas emissions but also provides a sustainable feedstock for industrial applications, contributing to a greener, circular economy.

Wastewater Purification via Sorbents and Their Potential as Fertilizers

We focus on designing advanced sorbent materials to remove pollutants from wastewater and then analyzing the spent sorbents for safe, beneficial reuse as fertilizer components. By supplying these sorbents as a nutrient source, it becomes possible to rehabilitate rural and post-mining areas by enhancing water transport and retention, improving soil quality, and increasing oxygen availability for the microorganisms responsible for soil reclamation.



Jan Wójcik - High Pressure Processes Research Group
Energetyków 9, 47-225 Kędzierzyn-Koźle, Poland
+48 664 718 934, + 48 77 487 34 53
jan.wojcik@icso.lukasiewicz.gov.pl