KEY FIGURES

solress
Next-generation of bio-based solvents

DURATION

48 Months

from September 2025 to August 2029

FUNDING FROM THE CIRCULAR BIO-BASED EUROPE JOINT UNDERTAKING

€7 Millions

A MULTI STAKEHOLDERS PROJECT

17 Partners from 9 countries

AIMPLAS PLASTICS TECHNOLOGY CENTRE
ΓΕΩΠΟΝΙΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΘΗΝΩΝ AGRICULTURAL UNIVERSITY OF ATHENS
Bio Base Europe Pilot Plant
Celignis
KAFFE BUENO
GALACTIC
GHENT UNIVERSITY
HYDROHM
Dermopartners Skin care contract manufacturing
ivl SVENSKA MILJÖINSTITUTET
TFC
KANSAI ALTAN
Solmeyea
CSIC
persea biotechnology
StoraEnso
BIOECONOMY FOR CHANGE

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Graphic design : www.links-web.fr

This project has received funding from the Circular Bio-based Europe Joint Undertaking (CBE JU) under grant agreement No 101214605. The JU receives support from the European Union Horizon Europe research and innovation programme and the Bio Based Industries Consortium.

Circular Bio-based Europe Joint Undertaking
Bio-based Industries Consortium
Co-funded by the European Union

solress
Next-generation of bio-based solvents

Replace fossil-based solvents with safe and sustainable bio-based alternatives from second-generation sugars

WHAT WE DO

The SOLRESS project proposes an integrated biorefinery system to produce 5 industrial solvents (ethyl acetate, ethyl lactate, butyl acetate, 2-MeTHF and GVL) post-consumer coffee grounds and lignocellulosic feedstocks.

These bio-based solvents, designed to meet industrial purity standards, will be tested in major solvent-using sectors including paints and coatings, cosmetics, and industrial material processing. The goal is to replace fossil-based and hazardous solvents with safer, sustainable bio-based alternatives.

OBJECTIVES

- Develop effective pretreatment processes for coffee grounds and white birch chips to recover pure sugar streams for fermentation processes.
- Optimize bioprocesses to convert CO_2 and hydrolysates into organic acids (lactic and acetic acid), improving sustainability and efficiency by integrating electrochemical methods for acetic and lactic acid extraction.
- Scale up bioethanol and biobutanol production from lignocellulosic feedstocks for bio-solvent synthesis including CO_2 capture technologies.
- Demonstrate esterification reactions and assess their effectiveness to produce ester bio-based solvents from organic acids and alcohols.
- Scale up furfural production from hemicellulose to produce other bio-based solvents and valuable by-products

EXPECTED IMPACTS

Scientific

• Use improved biotech and chemical processes to convert biomass into bio-based solvents, replacing fossil fuels and first-generation sugar-based solvents in certain applications.

Environmental

• Propose sustainable alternatives to fossil-based and hazardous solvents, reducing waste, improving resource circularity, and lowering environmental and health risks. The project will transform over one tonne of wood and one tonne of coffee waste into 100 L of ester bio-based solvents and 50 L of furfural solvents, to be tested in industrial applications.

Economical

• Promote the transition towards a zero-waste economy by recycling, within 10 years, 100,000 tonnes of coffee and wood waste annually to produce up to 50,000 tonnes of bio-based solvents

Societal

• Support new jobs, growth and investment by generating, within 10 years, over €100 million in revenue and creating more than 300 jobs.
• Increase the social awareness and consumer acceptance towards more safe, sustainable, and circular Bio-based solvents.
• Significant contributions to objectives of the EU Green Deal, SDG Goals, Circular Economy Action Plan, EU Waste Directives, packaging regulations.

APPLICATION FIELDS

- Paints & Coatings
- Chemical Industry
- Cosmetics & Personal Care
- Pharmaceuticals
- Food & Beverages
- Building & Construction
- Energy Sector

CONTRIBUTION TO SUSTAINABLE DEVELOPMENT GOALS