ELLIPSE

Circular Bio-based Europe Joint Undertaking

Bio-based Industries Consortium

Co-funded by the European Union

EFFICIENT AND NOVEL WASTE STREAMS CO-PROCESSING TO OBTAIN BIO-BASED SOLUTIONS FOR PACKAGING AND AGRICULTURAL SECTORS

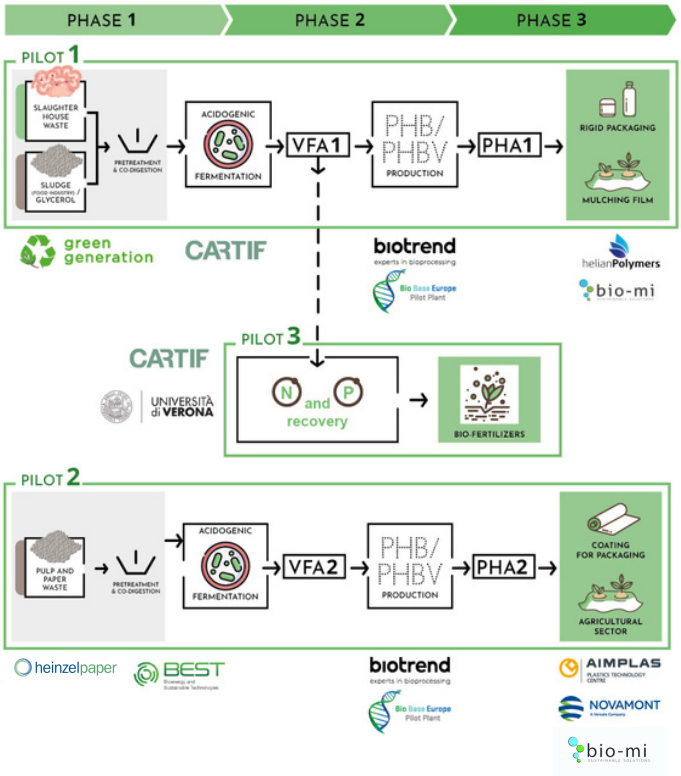
This project has received funding from the Circular Bio-based Joint Undertaking (CBE JU) under the European Union's Horizon Europe research and innovation programme under Grant Agreement No 101112581

INTRODUCTION

ELLIPSE project transforms industrial waste into valuable **bioproducts** by co-processing heterogeneous waste streams. This approach addresses **waste from slaughterhouses**, **the pulp** and **paper** industry, dairy industry sludge, and glycerol, converting them into **polyhydroxyalkanoates** (PHAs) and **bio-based fertilisers** (BBFs) for agricultural and personal care applications.

The project started in May 2023 and is funded by Circular Bio-Based Europe Joint Undertaking under **G.A. No 101112581** . During the first year, significant progress was made in optimising the production of volatile fatty acids (VFAs) from the waste streams. The consortium focused on characterising and selecting suitable waste samples, optimising pre-treatment methods and conducting acidogenic fermentation tests.

APPROACH



PRELIMINARY RESULTS

- **Waste Characterization and Selection** Samples from various pulp and paper industry processes and organic waste were analysed for different parameters. Samples with the most promising acidification results were selected for further analysis.
- Various **physical and chemical pre-treatments** were tested to enhance volatile fatty acid (VFA) yield. Combining multiple pre-treatments did not significantly improve the results.
- **Fermentation tests assessed VFA production** efficiency under different pH conditions. The predominant VFAs included acetic, propionic, and butyric acids.

NEXT STEPS

- Optimising fermentation parameters exploring downstream concentration techniques to enhance VFA production and PHA quality
- Pilot scale trials that involve scaling up the lab trials to 1 cubic meter, using various mixtures of dairy waste, bellygrass, and/or waste glycerine, with the aim to produce VFA-rich material for project partners to utilize.
- End of life alternative of validated products will be studied to confirm their recyclability and biodegradability.

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