

These industrially relevant organic acids (lactic acid (LA), succinic acid (SA), itaconic acid (IA), 3-hydroxypropionic acid (3-HP)) can be sold to other bio-based industries as building blocks for the production of biomaterials (e.g. bioplastics, animal feed, etc.) generating novel market opportunities.



Biomaterial

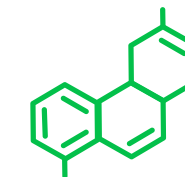
The four organic acids can also re-enter the production process flowchart of biorefineries, enhancing the sustainability and circularity of conventional products.

VIVALDI will use real off-gas emissions and wastewaters from 4 key bio-based industries' sectors

- Pulp & Paper
- Food & Drinks
- Bioethanol
- Biochemicals



Biobased Industries



Bioproduction of organic acids

MeOH and FA (used as carbon and/or energy source) and the **nutrients** recovered **are key elements for the bioproduction of organic acids**. The fermentation process is carried out with the specifically engineered yeast strain of *Pichia Pastoris*.

Purification & conversion



Biogenic CO₂ emissions

Via electrochemical conversion, the CO₂ originated from bio-based processes will be converted into methanol (MeOH) and formic acid (FA).

Nutrient recovery



Wastewaters

Nutrients such as NH₃, Ca²⁺, Mg²⁺ and K⁺ are recovered from the wastewaters of the same or nearby industries using bioelectrochemical systems.