

## Towards a circular bioeconomy: Urban biorefineries will transform municipal solid waste into bioproducts

## How can microalgae be integrated into waste biorefineries?

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In Europe, each habitant produces an average of 250 kg of Organic Fraction of Municipal Solid Waste (OFMSW) per year. OFMSW contains carbohydrates, proteins and lipids with high potential to be converted into bioproducts. The facilities that will transform waste into bioproducts, contributing to a more circular economy, are called **Urban Biorefineries**.

**Urbiofin Project** aims at demonstrating the techno-economic viability of transforming 10 t/d of OFMSW into chemical building blocks (bioethanol, VFA, biogas), biopolymers (PHA and biocomposites) and biobased fertilisers. One of the modules of the project will implement different biological technologies for the upgrading and valorisation of the biogas produced during the anaerobic digestion of OFMSW such as: anoxic desulfurisation of biogas, bioconversion of CH<sub>4</sub> into PHA and **photosynthetic biogas upgrading using microalgae**.

The **photosynthetic biogas upgrading using microalgae** combines the conversion of a OFMSW by-product into a consumer product (**biogas into biomethane**), the treatment of a waste effluent from anaerobic digestion (**digestate**) and the production of **microalgal biomass** for further valorisation as biofertiliser.

**Process description** 





## Publications

Marin et al. 2018, Bioresource Technology 255, 354-358 & Marin et al. 2018, Bioresource Technology 263, 58-66







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