URBIOFIN

Demonstration of an integrated innovative biorefinery for the transformation of Municipal Solid Waste (MSW) into new BioBased products

http://www.urbiofin.eu

Type of Action: Innovation Action - Demonstration

Value Chain: VC4 – organic waste

Start date: 01 June 2017

End date: 31 December 2021

BBI JU contribution: € 10,946,366.03

Summary

Each person in Europe generates an average of 500 Kg of municipal solid waste (MSW) per year. Around 50 percent of this is organic waste, made up of carbohydrates, proteins and lipids, all of which represent useful raw materials for creating valuable products. In addition, converting these will reduce the polluting effects and contribute to the shift to a genuine circular economy.

Digesting and composting have contributed to the reduction of the biodegradable fraction of MSW sent to landfill; however, the low economic value of compost and biogas means that citizens need to pay higher taxes for separate sourcing systems, slowing the potential uptake. However, new bio-based products can help to improve sustainability of such approaches.

The URBIOFIN project will demonstrate the techno-economic and environmental viability of converting the organic fraction of MSW on a semi-industrial scale. It will create chemical building blocks, biopolymers or additives using the biorefinery concept applied to MSW - i.e. urban biorefinery. Ultimately, URBIOFIN will offer a new feasible and more sustainable scenario alternative to the current treatment of the OFMSW.

Objectives

The URBIOFIN project has set a number of objectives:

- To evaluate the heterogeneity and compositional variability of the organic fraction of MSW in order to design the biorefinery and select representative feedstock.
- To define the industrial requirements for final bio-product properties.
- To reduce the operational costs of bioethanol production from the organic fraction of MSW by 20 percent.
- To demonstrate, at semi-industrial scale, the viability of continuous conversion of bioethanol produced from the organic fraction of MSW into bio-ethylene.
- To demonstrate, at semi-industrial scale,

Expected impacts

The URBIOFIN project is aiming to deliver the following impacts:

- To demonstrate that the current valorisation of the organic fraction of MSW can be improved, by converting it into chemical building blocks, biopolymers or additives. It will also generate biomethane and solid bio-fertilisers to valorise the entire organic fraction.
- To achieve a competitive price for the products produced by the URBIOFIN process
- Prepare the market for future introductions and commercialisations by ensuring products comply with requirements of EU legislation for safety, quality and purity.

Achievements & milestones

- continuous volatile fatty acids (VFAs) production from partial anaerobic digestion of the organic fraction of MSW.
- To validate, at semi-industrial scale, at least 50-60 percent of operational yields for Medium-chain volatile fatty acid (MCFA) and polyhydroxyalcanoates (PHA) production.
- To validate, at semi-industrial scale, PHA extraction process.
- To validate, at semi-industrial scale, biogas upgrading using microalgae.
- To produce new bio-based material from biogas.
- To produce final marketable products from the bio-based chemicals, polymers and additives obtained in URBIOFIN biorefinery and validate their performance.

How BBI JU is helping businesses to repurpose waste to drive new circular economic models

17 October 2019

As a conversation piece, the circular economy is on everyone's lips. It's not just a buzzword. With the global population predicted to approach 9 billion people by 2030, we are using more resources than the planet can provide. Our future depends on reusing what we have in a sustainable way. The BBI JU-funded project URBIOFIN is developing an integrated biorefinery for the transformation of municipal solid waste (MSW) into new bio-based products. Read more

Consortium

- Industrias Mecanicas Alcudia SA (Spain)
- AINIA (Spain)
- Urbaser SA (Spain)
- Biomasa Peninsular SA (Spain)
- Universidad de Valladolid (Spain)
- Exergy Ltd (United Kingdom)
- Novozymes A/S (Denmark)
- Stichting Wageningen Research (The Netherlands)
- Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas - CIEMAT (Spain)
- IRIS Advanced Engineering Ltd (Ireland)
- Natureplast SAS (France)
- Instituto Regional de Investigación y Desarrollo Agroalimentario y Forestal de Castilla-La Mancha (Spain)
- BCM BioEconomy Cluster Management GmbH (Germany)
- Stéfany Emballages et Services (France)
- The International Natural and Organic Cosmetic Association AISBL (Belgium)
- CSIC (Spain)

Former members

- G.I. Dynamics BV (The Netherlands)

Project coordination

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