EMBRACED EU Project - Establishing a multi-purpose biorefinery for the recycling of the organic content of Absorbent Hygiene Products waste in a circular economy domain

EMBRACED EU projekt - Uspostavljanje višenamjenske biorafinerije za recikliranje organskog sadržaja iz otpadnih apsorpcijskih higijenskih proizvoda u domeni kružne ekonomije

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INNOVATIVE PROJECT SCOPE

The Embraced project intends to demonstrate in a relevant industrial environment a circular model of integrated biorefinery based on the valorisation of the cellulosic fraction of post-consumer Absorbent Hygiene Products (AHP) waste towards the production of biobased building blocks, polymers and fertilizers.

- Validation into final products: Recycled plastic fraction into plastic bins and caps, deactivated cell from PHB fermentation into organic fertilizers, PHB into medical devices, biobased polymers into films for non-food packaging applications, recycled SAP into innovative absorbent underpads.
- Recovery of high valuable molecules and production of bio-energy:
  - Design of a system for recovery of phosphate, ammonium, potassium and urea contained in wastewater from AHP pretreatment process.
  - Valorisation of by-products from fermentation into bio-energy production.

PROJECT BACKGROUND

AHP waste, which is currently considered a non-recyclable fraction, represent between 2-4% of the total Municipal Solid Waste. Fater in the last years has developed and patented an innovative recycling solution for post-consumer AHP waste, already demonstrated at 1,500 t/year in Lovadina di Srescia (TV-Italy) in cooperation with the waste operator Contarina.

MAIN PROJECT OBJECTIVES

Feedstock:
Recovery of 3 high purity fraction: cellulose, plastic fraction and Super Absorbent Polymer (SAP).
Enhanced quality of cellulose by reducing the SAP content from 50% to 5%.
Conversion of AHP waste cellulose into building blocks and polymers:
- Demonstration of an innovative pretreatment technology for the obtaining of fermentable sugar from AHP waste cellulose to be converted through first of its kind biotech process into biobased building blocks of industrial interest.
- Demonstration of conversion of syngas from AHP waste into biodegradable Polyhydroxybutyrate (PHB)
- Demonstration of biobased and biodegradable polymers fromulation suitable for packaging applications

References: