PERCAL: Chemical building blocks from versatile MSW biorefinery

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

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WORKSHOP “BIO-WASTE”: Opportunities for bio-based industries. New feedstock driven

20/02/2019
Metal mechanical company funded in 1979.
High technological capacity.
Experience in petrochemical and refinery sectors.
25,000 m² of facilities. 180 employees.
Semi-industrial plant PERSEO Bioethanol®.
Biorefinery from Organic Urban Waste

Biotechnological process:
Transform the organic fraction of municipal waste into advanced bioethanol, bioproducts and bioenergy.
PERCAL will exploit Municipal Solid Waste (MSW) as feedstock to develop intermediate chemical products at high yield and low impurity level with huge industrial interest. These will be complementary to the bioethanol (current PERSEO Bioethanol® technology). To achieve a valorisation into:

1. Lactic acid (LA) to produce:
   - Eco-friendly ethyl lactate solvents by reactive distillation from lactic acid & bioethanol.
   - Hot-melt adhesives in combination with maleic anhydride by reactive extrusion.

2. Succinic acid (SA) as an intermediate building block to produce polyols for the polyurethane industry.

3. Biosurfactants by chemical and/or microbiological modification of protein and lipid fraction from remaining fraction of MSW fermentation.

Consortium:

Project budget: 3.4 M€. 3 years project (2017 – 2020)
Overall concept

Representative selected MSW streams

Biotechnology routes
Green Chemistry routes
Separation and purification
Enzymatic Hydrolysis

C | Carbohydrates
L | Lipids
P | Proteins

Succinic acid
Lactic acid
Ethanol

Fermentation by-products

Solvents for cleaning products, inks...
Hot melts Adhesives for cardboard
Polyols for polyurethane Industry

Final products
Demonstration of an integrated innovative biorefinery for the transformation of Municipal Solid Waste (MSW) into new BioBased products (GA 745785).

Demo Project Budget: 15 M€
Duration: 4 years project (2017 – 2021)

The consortium:
16 partners covering the value chain of MSW treatment to bioproducts
Project Objective

NEW MODEL OF OFMSW TREATMENT

Biorefinery
Multiple bioproducts
Higher value

OFMSW

URBIOFIN - Biorefinary

BIO-BLOCKS
- Bioethanol
- Volatile fatty acids
- Biogas

BIO-POLYMERS
- Polyhydroxyalkanoates
- Combined PHA's

ADDITIVES
- Bioethylen
- Biochemical products

VALUE

Landfill
Composting
Anaerobic Digestion
About 100 Mt of municipal biowaste is generated every year in Europe.

Only about a third (30 Mt) of this was separately collected and composted and/or digested (European Compost Network (ECN)).

Waste Framework Directive
Demand of sustainable and competitive biowaste treatment processes
Barriers:

• Waste legislation.
• Necessity of standards for bioproducts.
• Consumer acceptance of bioproducts coming from waste.
• Barriers to entry of new and feasible technologies in waste management.
Thank you for your attention!!