LIFE EBP

LIFE19 ENV/IT/000004

Ecofriendly multipurpose Biobased Products from municipal biowaste

INTRODUCTION

The aim of this document is to present an innovative project for the treatment of municipal bio-waste that reduces environmental impact and creates added value in the perspective of sustainable development. This document is addressed to **political stakeholders** at local, regional, national and European level.

LIFE EBP is an **environmental pilot project** that aims to demonstrate environmental, economic and social benefits of soluble **bioproducts** (BPs) and insoluble residues (IR) in the sectors of **municipal biowaste** management, agriculture and chemical industry in five European countries (Italy, Cyprus, Greece, France and Spain), taken as case studies.

Beside these results, LIFE EBP aims to **encourage joint ventures** among stakehoders in the sectors of waste management, agriculture and chemical industry and **promote industrialisation** of BPs/IR production and **uses** in all EU countries.

LIFE EBP is carried out **with the contribution of the LIFE Programme**, the financial instrument for the environment of the **European Union**.

LIFE EBP will commit the partners for four years, from October 2020 to September 2024.

THE ENVIRONMENTAL PROBLEM

LIFE EBP addresses **environmental problems** in the sectors of **municipal biowaste** (MBW) management, agriculture and chemical industry by two core actions:

- prove process for production of **new biobased products** (BPs/IR) from MBW;
- prove BPs/IR as **biofertilizers/agrochemicals**, **bio-based specialty chemicals** and **biopolymers** alternatives of commercial fossil-based products.

Municipal biowaste EU production is around **100 million tons per year**. Currently, MBW are treated in equal parts by *controlled fermentation (composting and digestate production)*, *incineration*, and/or *landfilled*, causing **serious environmental problems**.

The **environmental impact** of *composting* is mainly due to limited **greenhouse gases** (GHG) and **volatile organics emissions** and of *digestate production* stems mainly from **ammonia emission** and/or **nitrate leaching** due to application of digestate as fertiliser. *Incineration* produces **dust** and other **GHG** and **toxic organics**, and *landfill* releases **carbon dioxide** and **methane**.

Common **agriculture** practice is to boost plant production with **mineral and organic fertilizer** dose higher than adsorbed by plants. Thus, noxious fertilizers' components accumulate in soil, reach the food chain, leach through soil into ground water, and ultimately affect human and animal health.

Chemical industry produces **synthetic organic chemicals** from fossil sources. Major concern is **depletion of fossil source** and the increasing **GHG emissions**.

Surfactants are various chemicals used in the manufacture of many consumers' products, such as detergents among the mostly used; surfactants are massively used daily, and most are **dispersed in soil and water**. Concerns about their **ecotoxicity** arise from their tremendous daily consumption. Elevated concentrations of surfactants and their degradation products may **affect organisms** in the environment.

PROJECT OBJECTIVES

LIFE EBP has two main objectives.
The **first objective** is to demonstrate the **environmental, economic** and **social benefits** of new **biobased products** in the sectors of municipal biowaste management, agriculture, and chemical industry in five EU countries (Italy, Cyprus, Greece, France and Spain), by:

- replicating BPs/IR **production process** in **real operational conditions** using local municipal biowaste as feedstock;
- validating BPs/IR performance as **soil fertilizers, plant biostimulants/anti-pathogen agents, biopolymers** to make plastics, **surfactants** to make detergents;
- confirming BPs/IR **compliance with EU regulation** to **register BPs/IR** according to Waste Management Policy, Common Agriculture Policy and REACH Policy;
- assessing B**Ps/IR marketability**.

The **second objective** of LIFE EBP and based on the results of the pilot project is to **encourage joint ventures** among stakehoders in the sectors of waste management, agriculture and chemical industry and **promote industrialisation** of BPs/IR production and uses in all EU countries to **maximise the impact of project results**.

MAIN ACTIVITIES

LIFE EBP has four main actions to be carried out:
1) Construction of the **mobile prototype** to **process municipal biowaste** and **obtain BPs/IR** in Italy, Spain, Greece and Cyprus.
2) BPs/IR obtained from local MBW are **tested in local plants' cultivation**, in comparison with traditional commercial products. BPs are also used to **manufacure plastics and detergents**. Products are given to products to selected groups of customers to **assess products' marketability**.
3) **Life cycle environmental** and **economic assessment** (LCA/LCC) are carried out on processes and products to **estimate relevant impact categories** and CAPEX and OPEX **costs and benefits**.
4) **Process/product regulatory certification** studies potential regulatory/certification and **REACH registration issues** inherent to BPs production and uses. **Registration dossiers** are prepared. **Social life cycle assessment** (S-LCA) involves stakeholder mapping, analysis and 'value items' validation, proper impact categories and indicators.
5) Specific actions are carried out to **exploit/disseminate results** by identifying and contacting potential stakeholders, including policy-makers.

EXPECTED RESULTS

At project end, LIFE EBP will **validate in real operational environment** the following **expected results**:

- the hydrolysis of municipal biowaste (MBW) from different sources yields **90%** or more **soluble bioproducts** (BPs);
- **performance**-wise 1 kg BPs is **equivalent to** 5 kg NPK **fertilizers** and to at least 1 kg of **organic fertilizers** from fossil products;
- 5000 BPs and IR tons producible from 5000 MBW tns may allow **cultivating 100.000 soil ha** at average 50 kg/ha.

In place of *landfilling* and *incineration*, LIFE EBP will enable to measure the following **environmental benefits**:

- Reduction of 458 t **methane**, 983 t **carbon dioxide**, 200 kg **dust**, 7.7 t other **greenhouse gases** and **toxic organic**.
- Reduction of 14 t **nitrate leaching** through soil into groundwater.
- Reduction of 7500 t **CO2 emissions** from fossil Leonardite.

CONTRIBUTION TO EU POLICIES

LIFE EBP can **contribute to** achieve the objectives and to **update and integrate EU policies**:

- Decision 2010/707, 2013/208, 2014/322, COM/2009/0257 on **policies for employment**;
- **Europe 2020 strategy** for developing economy based on **knowledge and innovation**;
- EC new legislative proposal on strategy to **transform Europe** into a more competitive resource efficient economy, addressing a range of economic sectors, waste and circular efficient economy compatible with jobs and growth;
- **Circular Economy Action Plan** for sustainable growth;
- "**Towards a circular economy: A zero waste program for Europe**" aiming to increase the durability of products and create markets for recyclable materials;
- Employment policies, as **Green Employment Initiative**, on coordination of economic policy to play a more active role in supporting job creation in the transition to the green and resource efficient economy;
- The **European Green Deal**, the action plan to overcome the challenges related to climate change and environmental degradation;
- Regulation concerning the **Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)**.

THE LIFE PROGRAMME

The **LIFE Programme** is the financial instrument supporting **environmental and climate action projects** through the EU.
The **general objective of LIFE** is to contribute to the implementation, the updating and development of EU environmental and climate policy and legislation by co-financing project with EU added value.
EU regulation no. 2021/783 launched the sixth phase of LIFE for the period 2021-2027. The European Commission (**DG Environment & DG Climate Action**) manage the LIFE programme together with CINEA (the **European Climate, Infrastructure and Environment Executive Agency**).
The LIFE Programme is divided into **two sub-programme**: Environment and Climate action.
LIFE Environment is divided into ***Nature and biodiversity*** and ***Circular economy and quality of life***.
LIFE Climate action is divided into ***Climate change mitigation and adaptation*** and ***Clean energy transition***.

Some figures:
1992: years of birth of LIFE
5300: co-funded projects
5,6: billions of € cofinanced
6: phases of LIFE (LIFE I, LIFE II, LIFE III, LIFE+, LIFE, LIFE)

MORE INFO:

about **LIFE EBP**: www.lifeebp.eu - simone.solaro@hysytech.com

about **LIFE Programme**: https://cinea.ec.europa.eu/life_en