



# RESources from URban Bio-waSte:

## RES URBIS (in latin: things, goods, or affairs of the city)

### THE RES URBIS RATIONALE

#### To integrate treatment of all relevant bio-waste of urban origin

Huge amounts of organic residues originate from the sorted-collection of urban solid waste (**OFMSW**) and the sludge from urban wastewater treatment plants (**WWS**), which are **handled separately**.

**RES URBIS** aims to combine treatment of all bio-waste of urban origin, also including park and garden waste, and possibly residues from food-processing industry of suitable composition.

#### To develop an urban bio-waste biorefinery and related bio-based products

Integrated treatment of different bio-waste is functional to implement a novel **“urban biowaste biorefinery”** aimed to converting biowaste into useful **bio-based products**, especially towards **higher value products than biogas and compost**. By using an integrated approach, the minimal operating capacity of urban biowaste biorefinery can be reached even in small “waste basins”.

#### To take care of the whole technology chain and depending on territorial conditions

By converting urban biowaste into bio-products, **several industrial sectors have to be linked each other**, each one having its own business targets, needs and specifications.

Because driving forces and constraints highly depend on territorial conditions, affordable economic strategies have to be tailored with respect to autonomous **clusters**, e.g. where “waste basin” is large enough and recovery cycles are possibly closed within the cluster itself.

#### To take care of all other technical and non technical constraints

Regulatory (e.g. “end of waste”), environmental, and social constraints have to be also addressed, by also taking into account local, regional and national conditions

### RES URBIS consortium

#### FACTS:

3-year project  
3 million Euros  
21 partners  
from 8 nations

4 territorial clusters:  
8 770 500 population  
3.3 MTons/year waste  
294 KTONs/year dry sludge  
(2014 data)

- University
- Research Institute
- Industry
- Public Administration
- Territorial clusters



European Union

\* stakeholder

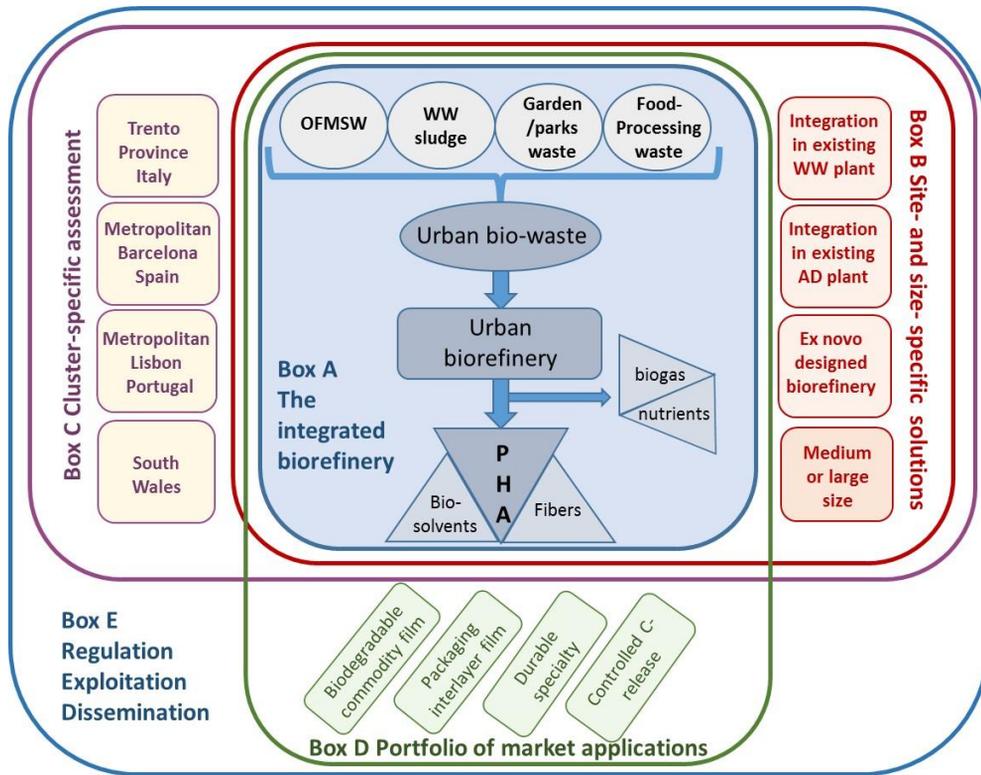
Process-related challenges
University of Roma “La Sapienza” (Italy)
New University of Lisbon (Portugal)
University Ca Foscari of Venice (Italy)
University of Barcelona (Spain)
University of South Wales (UK)
University of Bologna(Italy)
Biotrend (Portugal)
Physis (Italy)
CNR – IRSA(Italy)
Inst. Nat. Recherche Agronomique (France)
Product-related challenges
Biolnicia (Spain)
Mi-Plast (Croatia)
Softer (Italy)
Territorial clustering
Empresa das Águas Livres (Portugal)
Barcelona Metropolitan Area (Spain)
Province Autonoma di Trento(Italy)
Rhondda Cynon Taff County Council (UK) *
Economics and exploitation
Execon Partners (Switzerland)
Bio-Based and Biodegradable Industries Association (UK)
Regulation, safety, environmental and social aspects
Technical University of Denmark (Denmark)
National Institute for work safety (Italy)
University of Verona (Italy)

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# From organic waste of urban origin to valuable bio-based products: the urban biowaste biorefinery

## RES URBI activities

- **collection and analysis of data** on urban bio-waste production and present management systems in **four territorial clusters** in different countries, with different characteristics.
- well-targeted **experimental activity** to solve open technical issues by using appropriate combination of innovative and catalogue-proven technologies.
- **market analysis** within several economic scenarios and business models for full exploitation of **bio-based products**.



## The RES URBI box model

Several bio-based materials will be produced

- ✓ polyhydroxyalkanoate co-polymers (PHA)
- ✓ biosolvents (to be reused in PHA extraction), and
- ✓ fibers (to be reused for PHA biocomposites)

A portfolio of **PHA-based bioplastics** will be produced **at pilot scale**, to be tested for different applications:

- ✓ Biodegradable commodity film,
- ✓ Packaging interlayer film,
- ✓ Specialty durables (such as electronics),
- ✓ Premium slow C-release material for ground water remediation

- **Technical- economic analyses** of the whole technology chain will be done with reference to **selected territorial clusters**, by considering either the **ex-novo implementation** of the urban biowaste biorefinery or its **integration** into existing wastewater treatment or anaerobic digestion plants.

*PHA production pilot plant, by Universities La Sapienza of Rome and 'Ca Foscari of Venice*