

**DEEP  
PURPLE**



**Solar biorefineries:  
bioenergy and valuable  
resources from urban  
waste streams**

EU Green Week- WOW Interreg Webinar

**Recovery of valuable resources from  
wastewater**

Victor Monsalvo

Head of Ecoefficiency Area, Innovation  
and Technology Department

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# Background

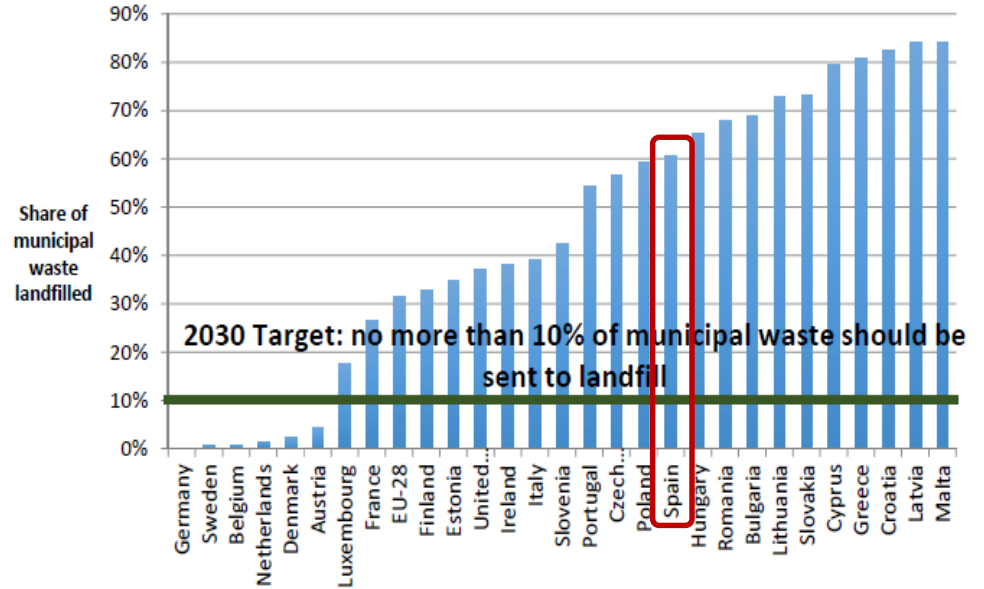
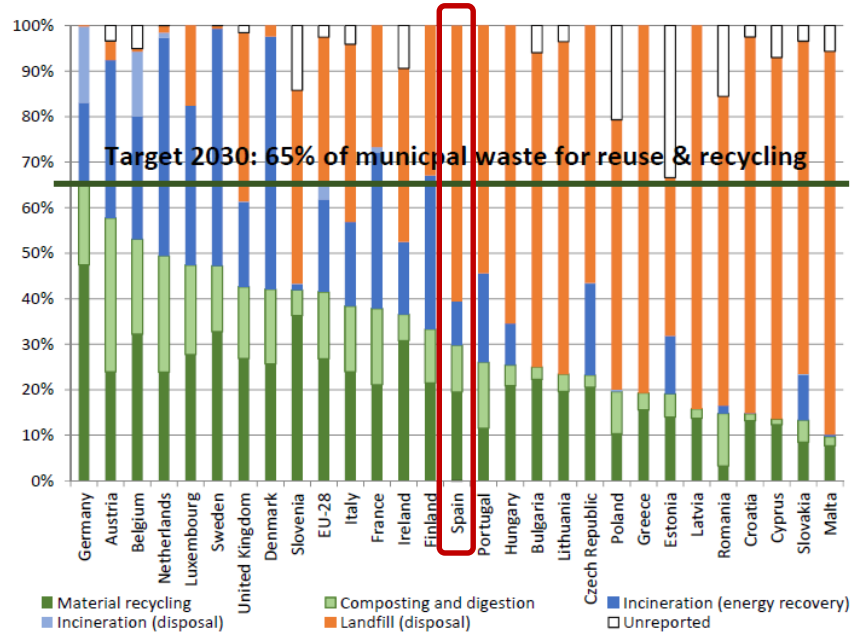


“This project has received funding from the Bio Based Industries Joint Undertaking (JU) under the European Union’s Horizon 2020 research and innovation programme under grant agreement No 837998. The JU receives support from the European Union’s Horizon 2020 research and innovation programme and the Bio Based Industries Consortium.”.





## EU 2030 BIOECONOMY TARGETS



## FROM BIOWASTE TO BIORESOURCE



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# Objective



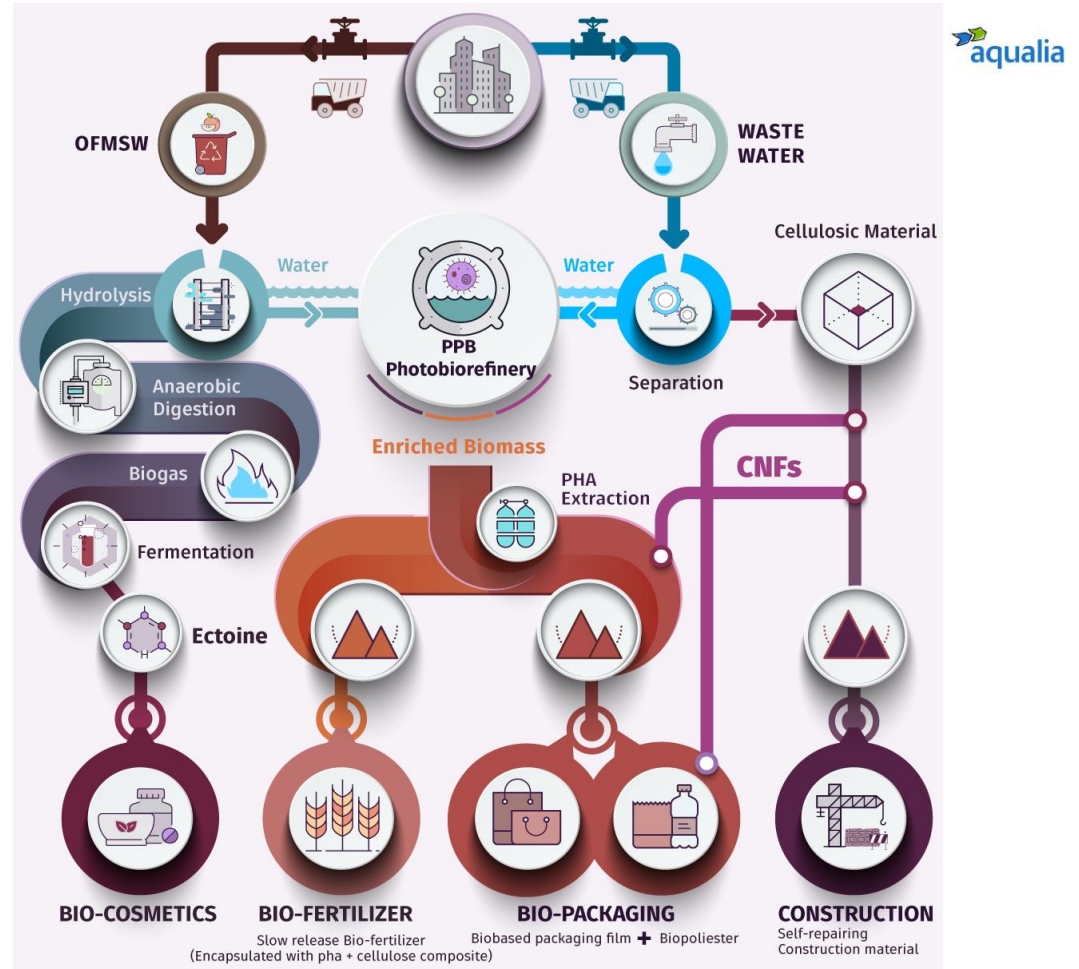
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## Objective

Demonstration of a versatile, integrated and flexible **Multi-Platform Biorefinery** to recover high added-value compounds from **urban waste streams** for the production of:

- slow-release fertilizers
- biofuel (biomethane)
- cosmetics
- self-healing construction material
- bioplastics (bio-polyesters and packaging)



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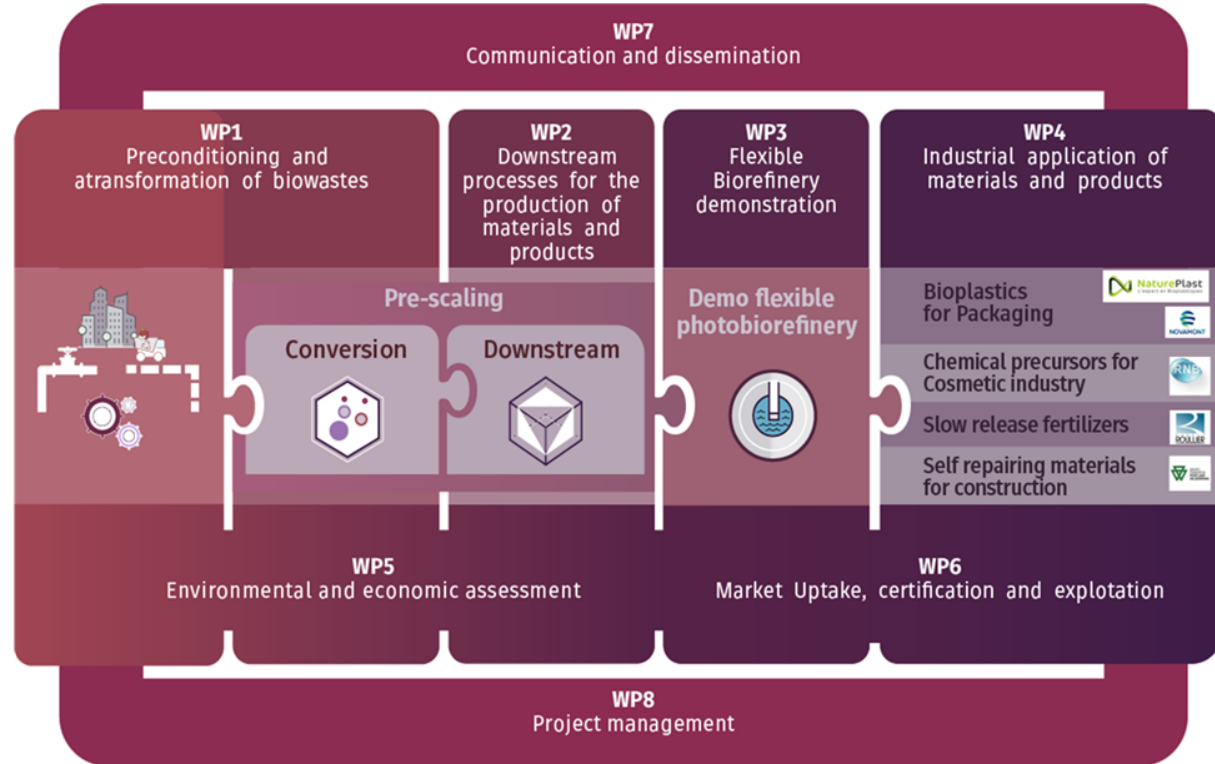
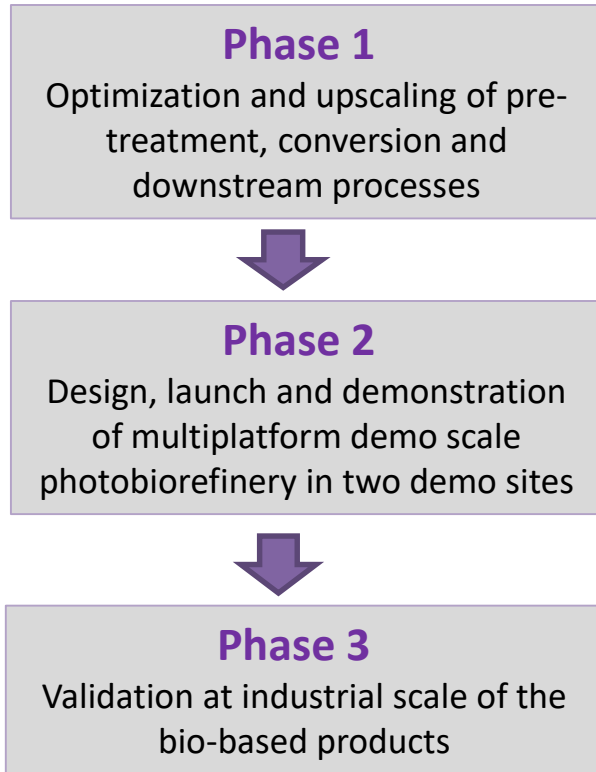
# Project methodology



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# Project methodology



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# Consortium

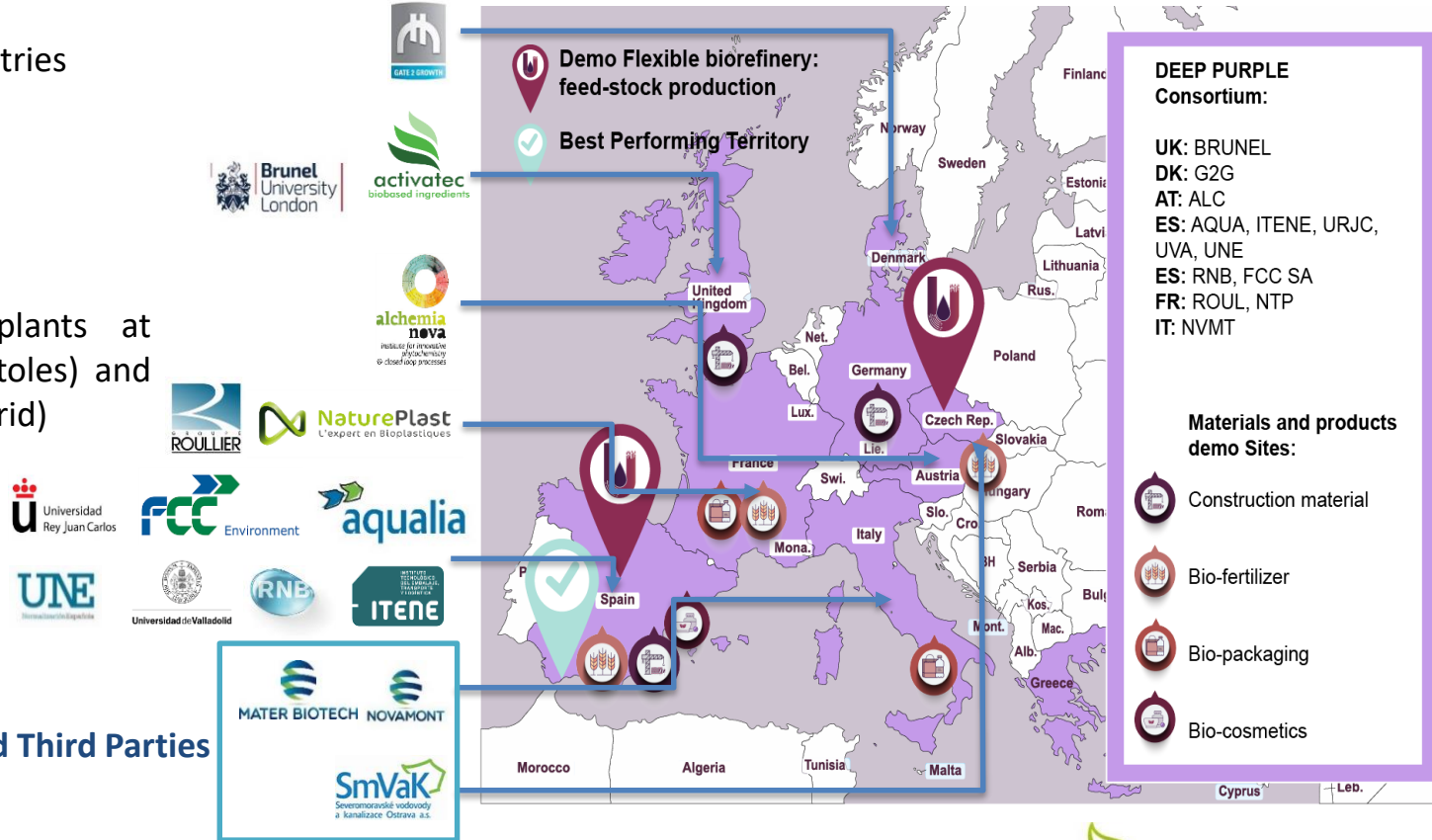


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# Consortium

- ❑ 14 partners, 6 countries
- ❑ 2 Demo-sites
  - Spain
  - Czech Republic
- ❑ Pre- and pilot plants at WWTP URJC (Mostoles) and Toledo, MSW (Madrid)



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## Demo sites



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# Demo sites

## Demo sites

- 1 Demo Site 1: Linares (Spain)
- 2 Demo Site 2: tbd

## Production sites

-  All-RG fertilizers production plant (Saint-Malo, France)
-  Mater-Biotech demo facility (Terni, Italy)
- ITENE facilities (Valencia, España)
- NVMT pilot plant (Novara, Italy)
-  RNB facilities (Valencia, Spain)
- ACTIV facilities (Coventry, UK)
-  Brunel University (London, UK)



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## Main figures



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# Main figures



95% ectoine extraction efficiency  
4% dry weight

+32%



+36%



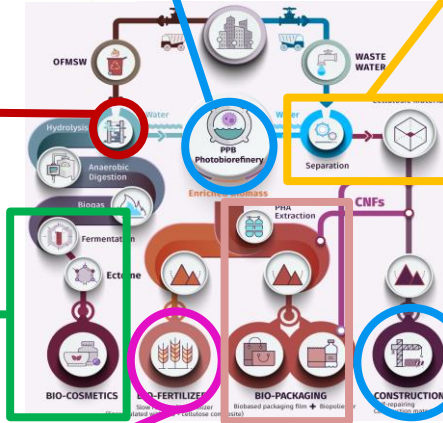
Biomass



Extraction



98% pure PHA  
72% PHA recovery

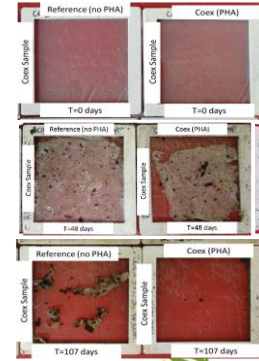


Recovered cellulose  
from wastewater

Cellulose nanofibres (CNFs)



Self-healing construction  
material



Improved  
mechanical  
properties and  
20% faster  
biodegradation



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## Even bigger! Upscaling to demonstrative scale

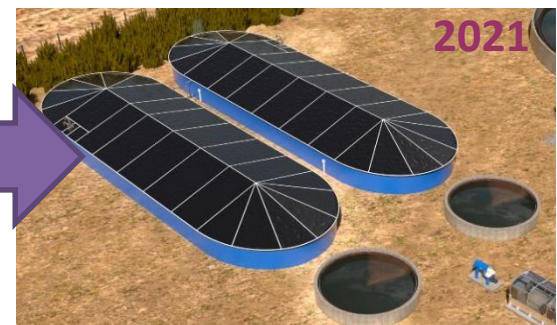
Solar-powered plant to obtain **bioproducts** and compliance with wastewater discharge limits



2018



2020



2021

Pre-pilot scale

2 x 0.5 m<sup>3</sup>

3.5 m<sup>3</sup>/d

0.35 m<sup>3</sup> PPB biomass/d

Pilot scale

2 x 32 m<sup>3</sup>

20 m<sup>3</sup>/d

2 m<sup>3</sup> PPB biomass/d

Demo scale

2 x 140 m<sup>3</sup>

500 m<sup>3</sup>/d

35 m<sup>3</sup> PPB biomass/d

Where?  
WWTP Estiviel  
(Toledo, Spain)

WWTP Estiviel  
(Toledo, Spain)

2 demo sites  
(Spain + tbd)

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## Main figures

# The largest 100% solar anaerobic photobiorefinery in the world



### MAIN TARGETS

- Treatment of **422 t/y OFMSW** and **438,000 m<sup>3</sup>/y mixed waste** (including wastewater)
- Production of **440 t/y of bio-products**: bio-cosmetics, slow-release bio-fertilizers, bio-packaging and self-healing construction materials
- GHG emissions savings: **11,300 tCO<sub>2</sub>eq/y**
- **60% reduction** of landfilled OFMSW
- **Environmental, Social and Economic Assessment**



11,300 t/y



525,000 trees



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# DEEP PURPLE

[www.deep-purple.eu](http://www.deep-purple.eu)

Thank you!

Víctor Monsalvo (Project Coordinator)

[victor.monsalvo@fcc.es](mailto:victor.monsalvo@fcc.es)



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Bio-based Industries Consortium

