



9-10<sup>TH</sup> APRIL

FINAL EVENT

# Three bio paths, one solution for plastics

Madrid | Spain

**Centro Cultural  
La Corrala**

Universidad Autónoma de Madrid  
C/ Carlos Arniches, 3 y 5  
28005 – Madrid



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indicating final event recover

# DAY 1

## 9<sup>TH</sup> APRIL 2024

**11:00** WELCOME ADDRESS BY CHLOE JOHNSON (PROJECT OFFICER)

### What was achieved? – Main results of plastic degradation with enzymes

<b>11:20</b>	<b>Marta Redrado Notivoli</b> Coordinator Bizente, Aitiip	BIZENTE – Applying enzymes to resolve end-of-life issues of thermoset composite plastics
	<b>Juan Antonio Tamayo Ramos</b> Coordinator ENZYCLE, ITENE	ENZYCLE – Microbial enzymes for treatment of non-recycled plastic fractions
	<b>Maria Jose Lopez</b> Coordinator RECOVER, UAL	RECOVER - Development of innovative biotic symbiosis for plastic biodegradation and synthesis to solve their end of life challenges in the agriculture and food industries

**12:20** Urgent Questions

**12:30** LUNCH & POSTER SESSION

### World Café

<b>14:00</b>	<b>DISCUSSION HOSTS 1:</b>	<b>Topic enzymes</b>
	<b>Christian Sonnendecker, UL</b>	Can potential enzymes for different approaches be found?
	<b>Kristie Tanner, Darwin</b>	Multienzymatic cascades or single enzymes?
	<b>Arno Cordes, ASA</b>	Which conversion rates are required, which are feasible for certain approaches?
	<b>Miguel Alcalde, EVO</b>	How important is the directed evolution of enzymes in order to adapt “their “appetite” to the respective type of plastic?
	<b>Javier Viña, EVO</b>	
	<b>Ronan Mccarthy, BRUNEL</b>	Use of selected microorganisms in combination with enzymes
	<b>Macarena Jurado, UAL</b>	Enrichment of native plastic-associated bacterial communities to increase plastic degradation activity
	<b>Ana Mencher, ITENE</b>	Use of synthetic biology approaches to maximise the microbial degradation of plastics
	<b>Daan Van Vliet, WUR</b>	Is directed evolution currently capable of solving the hurdles of plastic manufacturing?
	<b>DISCUSSION HOSTS 2:</b>	<b>Topic recycling process:</b>
	<b>Tommaso de Santis, acib</b>	Where do you see the hurdles for enzymatic recycling?
	<b>Beatrice Mongili, BSP</b>	What are the cost drivers that need to be optimised?
	<b>Mikel Dolz, EVO</b>	What influence do material pre-treatments have on the efficiency of enzymatic degradation?
	<b>Steven Verstichel, OWS RF</b>	
	<b>Marie-Aline Pierrard, IDELUX</b>	Role of biodegradable materials and organic recycling (compostability, AD) in a sustainable economy (enzymes are an important part of the biodegradation process)
	<b>Cristina Fernandez, IRIS</b>	Current organic waste treatment facilities (AD & composting)
	<b>Alessandro Nardecchia, IRIS</b>	Identification and sorting of materials entering waste treatment facilities
		The importance of process manufacturing when introducing enzymes in plastics: how the extrusion-compounding should be adapted? Pre-treatments and process adaptation?
		Could the activity of enzymes be monitored or quickly measured after extrusion-compounding and/or other plastic manufacturing steps?



## World Café

### DISCUSSION HOSTS 3:

**Mathéo Berthet**, SP

**Alain Graillot**, SP

**Patrizia Cinelli**, UNIP

**Raul Moral**, UMH

**Maria Machado**, ENTOGREEN

### Topic of reuse and upcycling opportunities:

What are the quality requirements for monomers from recycled plastics and how can they currently be met?

What challenges need to be overcome?

How do we know what kind of reuse or upcycling is possible?

What are the properties of the monomers obtained and how do they differ from those obtained using other recycling methods?

Can you describe in detail the phases of the conversion of monomers produced by enzymatic degradation in order to make them usable for new applications?

What are the technical challenges involved in this conversion and how are they overcome?

Composite materials with insect residues and materials coated with chitin/chitosan

Biofertilizers in the context of plastics recycling

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**15:00**    **Presentation of results through discussion hosts**

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**15:30**    **COFFEE BREAK**

## Connection of results and application in industry - Insights from first hand

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**16:00**    **Alain Marty**  
CARBIOS                                      Enzyme: an elegant solution for PET recycling

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**Susana Quiles**  
ACCIONA                                      Enzymatic perspectives to convert future composites into sustainable and high-value products

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**Maria Machado**  
ENTOGREEN                                      Black soldier fly, a path that leads to an organic gold

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**16:45**    **Discussion**

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**17:00**    **END OF 1<sup>ST</sup> DAY**

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# DAY 2

## 10<sup>TH</sup> APRIL 2024

### Future Perspectives – a bridge to politics and policy

10:15	<b>Samuele Ambrosetti</b> Bio-based Industries Consortium	BIC's position on the cascading use of bio-based resources including recycling
	<b>David Newman</b> European Bioeconomy Bureau	Plastic pollution, climate change and novel technologies- linking up the issues
	<b>Fernando Gómez Hermoso</b> Euro Funding	European policies and strategies: addressing technological challenges and funding needs in science and innovation

11:00 **Discussion**

### Synergy-Session

11:10	<b>Cristiano Varrone</b> UPLIFT, Aalborg University	Upcycling Bioplastics of food and drinks packaging
	<b>Lalitha Gottumukkala</b> ENXYLASCOPE, Celignis Analytical	Mining Microbes and Developing Advanced Production Platform for Novel Enzymes to Rapidly Unleash Xylans' Potential In a Scope Of Products For the Consumer Market
	<b>Manuel Ferrer</b> FUTUREZYME, Institute of Catalysis and Petrochemistry	Technologies of the Future for Low-Cost Enzymes for Environment-Friendly Products
	<b>Auxi Prieto</b> REVOLUZION, Center for Biological Research	The power of enzymes to solve bioplastics circularity
	<b>Aurelio Hidalgo</b> RADICALZ, Molecular Biology Center Severo Ochoa	Unleashing the potential of enzymes for more sustainable consumer products
	<b>Kristina Eissenberger</b> PRESERVE, Albstadt-Sigmaringen University	High performance sustainable bio-based packaging with tailored end of life and upcycled secondary use

12:40 **Discussion**

13:00 **END OF MEETING – LUNCH FOR ALL PARTICIPANTS**

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### ORGANIZING COMMITTEE

Juan Antonio Tamayo Ramos

Katrin Weinhandl

Olivia Laggner

Nieves Barnuevo

Marta Redrado

Lara Escudero

Laura Serrador Alarcon

Raffaele Turri

Maria Jose Lopez Lopez

Ana Plaza

Manuel Lucena

Marco de la Feld

