



# Circular economy for biodiversity Unlocking the green potential

*TUS Ireland*

**EUROPEAN  
YEAR OF  
SKILLS**

Date

June

5

3-11 June 2023

**#EUGreenWeek  
PARTNER EVENT**

**Technological University of the Shannon:  
Midlands Midwest**

Ollscoil Teicneolaíochta na Sionainne:  
Lár Tíre Iarthar Láir





### Ennis Campus

This campus in the bustling market town of Ennis is home to LIT's expanded level of daytime undergraduate education in Co. Clare and the new facility enables a substantial increase in the education offering in the town. A total of five degree programmes in social care work, early childhood education and care, and business are available through the CAO at LIT in Ennis. The LIT Ennis Campus is located on Bindon Street in the town's historic centre. The high ceilings and expansive windows of LIT's newest place of learning reflects the history of the building, while the bright modern internal refurbishment speaks to its future as part of a TU.



### Athlone Campus

The Athlone campus is located in the heart of the Irish Midlands, just outside the town of Athlone. Divided into east and west, and comprising 49 acres, the contemporary campus offers state-of-the-art academic and sporting facilities and world class research and development capabilities.

The Athlone campus is home to three strategic research institutes (materials, bioscience, and software) and two technology gateways (APT and COMAND) which drive high-TRL, market-informed research in collaboration with industry partners. The Midlands Innovation and Research Centre (MIRC), a business incubator which provides incubation facilities and business development support for knowledge-based start-ups, is also located on site.



### Moylish Campus

The main campus at Moylish Park is located next to Munster Rugby's Thomond Park and is a short walk from Limerick GAA's LIT Gaelic Grounds, home of the 2018 All-Ireland Senior Hurling Champions and 2019 Munster Champions. In 2019, LIT and Limerick GAA signed a unique partnership agreement that will yield many advantages for LIT students and TU students of the future, including a dedicated sports scholarship programme.

A vibrant campus community, facilities at Moylish include the Millennium Theatre, lecture theatres and science labs, modern computer suites, student support services and the student centre with its radio station and games room. The campus has an impressive range of sports facilities for students, with three full size grass pitches and an all-weather playing pitch, as well as a fitness centre and indoor sports hall. Although the largest of the LIT campuses, the commitment to small class sizes and an open, supportive and friendly environment ensures that student won't get lost in the crowd.



### Thurles Campus

Thurles is a vibrant town and is a great, central location in which to live and study. Well serviced by the Irish Rail network, it has a growing reputation as a college town.

The Thurles campus has a student-centred and friendly campus environment. It incorporates a 200-seater conference centre, lecture theatres, computer suites, science laboratories and specialist games development labs. It also boasts the cutting-edge LIT Sports Lab, a world standard strength and conditioning facility. Further sport developments are planned, including a new, indoor clay court tennis facility and additional GAA facilities for this campus in the town where the GAA was founded in 1884.



### Clare Street Campus

The Clare Street campus is home to the internationally renowned Limerick School of Art & Design (LSAD), a vibrant, living "canvas" for the creation, display and celebration of the artistic talents of the students. It has an award winning reputation, - the Fashion Department is listed in the top 50 worldwide, and it has cutting-edge creative technologies for student learning.

With its roots as a place of learning and training going back to 1852, LSAD is one of the most significant providers of art and design education in Ireland. Students learn from leading art and design practitioners; can access excellent workshop, studio and exhibition facilities and where their education is informed by the latest developments in the wider world of art and design.



### Clonmel Campus

The digital campus in Clonmel is situated in south Tipperary. Although a small campus, Clonmel provides a relaxed and friendly, yet creative learning space for students and is the centre for our popular and innovative degrees in game art and design, digital animation, and creative media and design.

# PRISM

- Polymer Processing
- Additive Manufacturing
- Composites
- Controlled Release
- Biomedical Materials
- Packaging
- Mechanical and Enzymatic Recycling
- Advanced and Smart Manufacturing
- Advanced and Smart Materials



**Technological University of the Shannon:  
Midlands Midwest**

Ollscoil Teicneolaíochta na Sionainne:  
Lár Tíre Iarthar Láir

# Biopolymer synthesis from waste

- Polylactic acid
- Nanocellulose
- PHB
- Cellulose acetate

## Processing



**Technological University of the Shannon:  
Midlands Midwest**

Ollscoil Teicneolaíochta na Sionainne:  
Lár Tíre Iarthar Láir



# Biopolymer modification and characterization

## Product design and development - centre for industrial services and design (CISD)

- Concept to Manufacture
- Solid and Surface 3D CAD modelling, 3D parametric and direct modelling
- Product Concept Digital Visualisation, Prototyping, Design for Manufacture / Assembly / Environment
- Computer Aided Engineering (CAE)

## Degradation and recycling

- Respirometer for CO2 monitoring
- Weather chamber/accelerated aging
- Chemical recycling via reactive extrusion
- Mixed plastic recycling



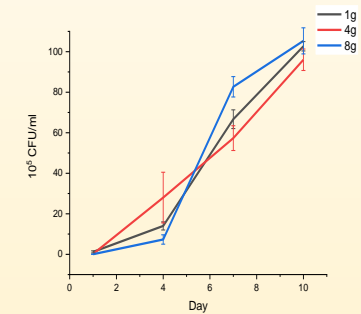
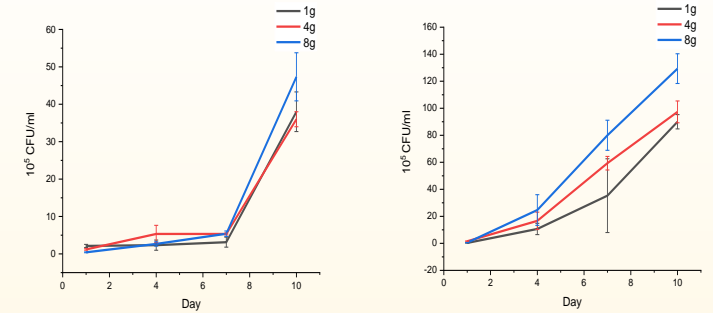
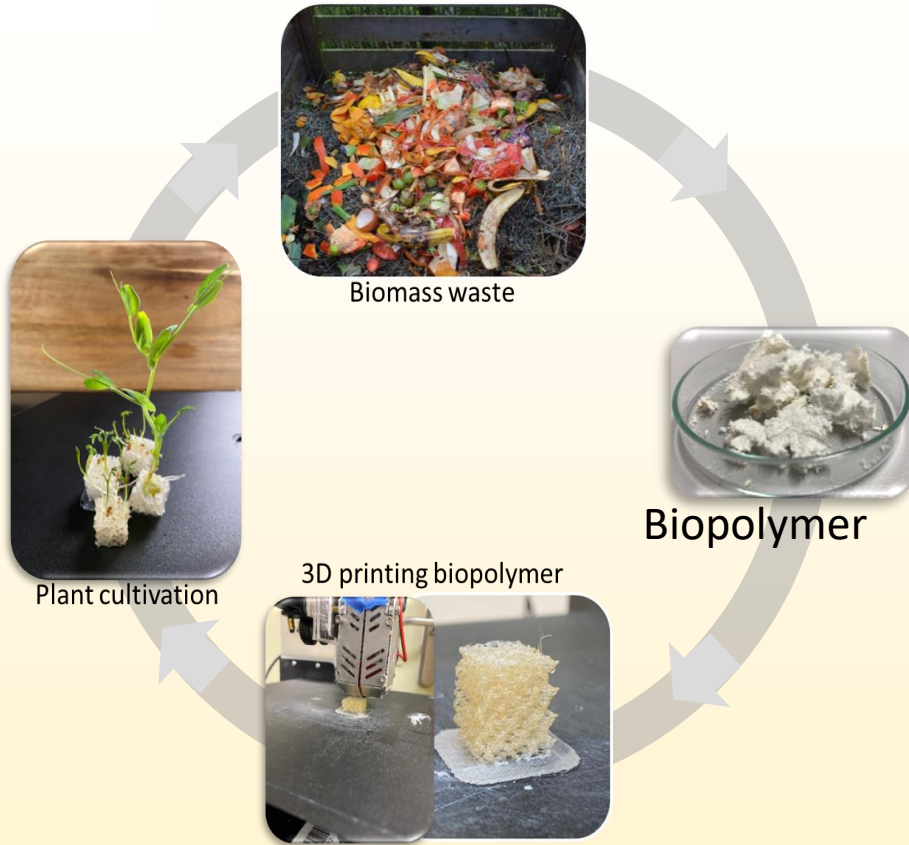
**Technological University of the Shannon:  
Midlands Midwest**

Ollscoil Teicneolaíochta na Sionainne:  
Lár Tíre Iarthar Láir



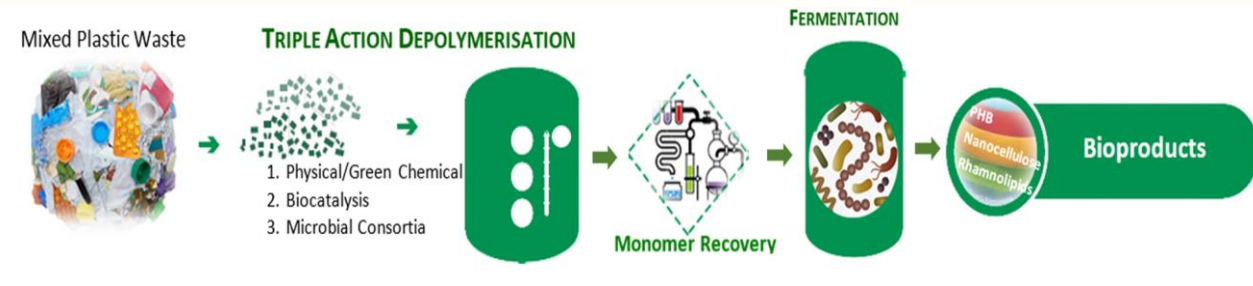
Réaltai Fás

# In-situ production of cellulose for use in hydroponic systems from organic wastes on a moon base



**Technological University of the Shannon:  
Midlands Midwest**

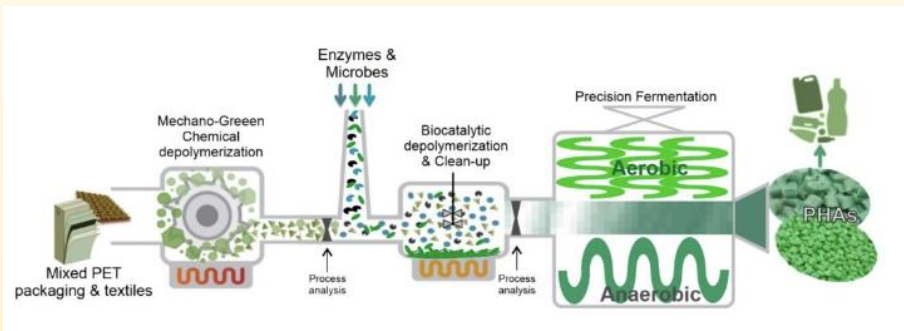
Ollscoil Teicneolaíochta na Sionainne:  
Lár Tíre Iarthar Láir



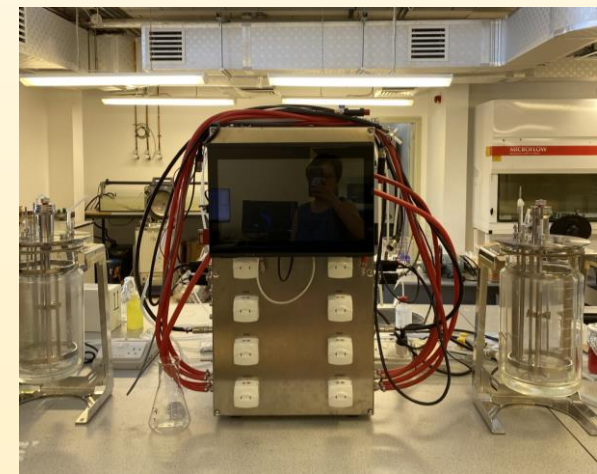
Accelerate degradation of mixed waste plastic & valorise as biopolymers and bioproducts as sustainable replacement plastics – **Plastics 2.0.**



EIC pathfinder



Removal by diversion of waste mixed PET plastics and textiles, Green Depolymerisation into constituent monomers, Bioconversion into PHA Bioplastics & Processing as new Eco-plastics and bioproducts



**Technological University of the Shannon:  
Midlands Midwest**

Ollscoil Teicneolaíochta na Sionainne:  
Lár Tíre Iarthar Láir



# CurCol

European Regional Development Fund

THEMATIC PRIORITY:



PROJECT  
AREA

Our aim is to develop and demonstrate the first locally produced biobased sustainable colourants from curcumin, to meet paper and plastic packaging requirements.

TUS: natural curcumin coloured bioplastic blends



**Technological University of the Shannon:  
Midlands Midwest**

Ollscoil Teicneolaíochta na Sionainne:  
Lár Tíre Iarthar Láir



@BeyondPeat



An Roinn Talmhaíochta,  
Bia agus Mara  
Department of Agriculture,  
Food and the Marine

Utilising organic bio-resources and novel technologies to develop specifically and sustainable peat replacements for professional horticultural crop production

TUS: developing biopolymer-based growing substrates



**Technological University of the Shannon:  
Midlands Midwest**

Ollscoil Teicneolaíochta na Sionainne:  
Lár Tíre Iarthar Láir





Traceless: Developing fully biodegradable tree support products with controlled release of fertilizers and pesticides to avoid microplastic and chemical pollution



- Biodegradable at ambient conditions
- Controlled release of fertilizers and pesticides



**Technological University of the Shannon:  
Midlands Midwest**

Ollscoil Teicneolaíochta na Sionainne:  
Lár Tíre Iarthar Láir



Business-driven systemic solutions for sustainable plastic packaging reuse schemes in mass market applications

TUS: assessing the reusability of selected plastic packaging and developing biodegradable packaging



**Technological University of the Shannon:  
Midlands Midwest**

Ollscoil Teicneolaíochta na Sionainne:  
Lár Tíre Iarthar Láir



# Target calls

[HORIZON-JU-CBE-2023-R-02](#) Optimised forest-based value chains for high-value applications and improved forest management - €10 million

[Funding & tenders \(europa.eu\)](#)

[HORIZON-JU-CBE-2023-R-04](#) Development of novel, high-performance bio-based polymers and co-polymers - €10 million

[Funding & tenders \(europa.eu\)](#)

[HORIZON-JU-CBE-2023-IAFlag-03](#) Bio-based packaging materials with improved properties: barrier, food contact, forming, printability, safety, recyclability/circularity-by-design - €17 million

[Funding & tenders \(europa.eu\)](#)

[HORIZON-JU-CBE-2023-IA-07](#) High performance, circular-by design, bio-based composites - €15 million

[Funding & tenders \(europa.eu\)](#)

[HORIZON-JU-CBE-2023-IA-04](#) Recycling bio-based plastics increasing sorting and recycled content (upcycling) - €15 million

[Funding & tenders \(europa.eu\)](#)

# Contact details

**Yuanyuan Chen**

**Yuanyuan.Chen@tus.ie**