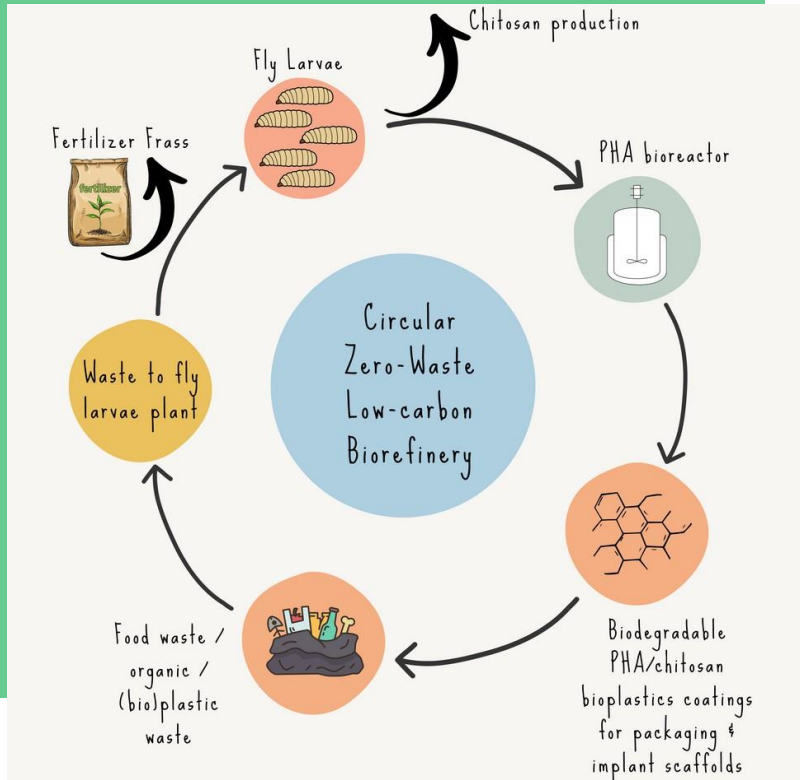


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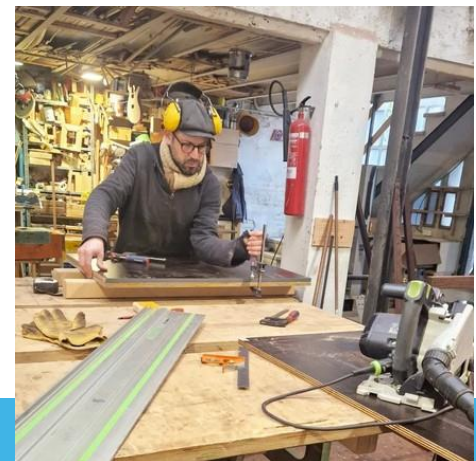
Exordium

BioLaMer is an EIC Pathfinder Open Project addressing the Food Waste and Petrochemical Plastics Challenges by Introducing a New Food Waste Value Chain.

BioLaMer welcomes you to its Second Edition Newsletter

The strength of BioLaMer route;

- The feedstock is renewable and inexpensive.
- It provides less complexity as the larvae has almost invariable chemical composition.
- It can be used to mitigate food waste problem.
- It can reduce the use of crop based feedstocks for biopolymer production.
- It doesn't disturb biodiversity, instead supports biodiversity initiatives.
- It can avoid/reduce pre-treatment cost that are associated with other waste-streams to produce the platform chemicals for biopolymer production.



First Prototype

BioLaMer has finished the process of constructing the first module of the 'small scale' prototype design of the Black Soldier Fly Larvae Bioreactor. The module was engineered with precise control over environmental factors like temperature, humidity, and lighting, facilitating optimal conditions for the larvae to hatch and grow during their newborn phase.



MAIRE...
Le tecnologie affrontate dal Gruppo di Ricerca EMERG (Environmental Management Research Group) riguardano lo sviluppo e le applicazioni industriali di nuovi materiali ottenuti da scarti di produzione, anche in ambito marittimo.
Nel gruppo EMERG lavorano gli strutturati Andrea Corini (Responsabile), Serena Righi, Diego Marazza, Stefano Macrioni e Antonio Primavera, oltre a numerosi assistenti di ricerca, dottorandi e studenti e studenti magistrali che svolgono nella sede di lavoro. Il Gruppo EMERG partecipa al progetto BioLaMer, finanziato dall'Europeo.

an Innovation Council (EIC) e coordinato dal Trinity College di Dublin, che attraverso la ricerca innovativa che, partendo dall'altissima tecnologia di larve di mosca nutrite con rifiuti di origine alimentare, produrrà polidestinati, biopiemme utilizzabili per ottenere prodotti plastici biodegradabili.
Se il progetto dimostrerà la fattibilità di tale tecnologia, esso contribuirà ad affrontare due importanti problemi ambientali: la gestione di grandi quantità di rifiuti alimentari e la presenza di plastiche non biodegradabili nell'ambiente, in particolare quello marino.

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NOT JUST THE SEA, ALSO AND ABOVE ALL RENEWABLE ENERGY

The topics addressed by the EMERG (Environmental Management Research Group) concern the development and industrial applications of new materials obtained from industrial waste, also in the marine field. The EMERG group is composed by Andrea Corini (Head), Serena Righi, Diego Marazza, Stefano Macrioni and Antonio Primavera, as well as several research fellows, doctoral students and master's students, who carry out their degree thesis in the Group. The EMERG is involved in the European BioLaMer project, funded by the European Innovation Council (EIC) and coordinated by Trinity College of Dublin, which will test an innovative bioreactor that will produce polyhydroxybutyrate biopolymers that can be used to make biodegradable plastic products, starting from the breeding of larvae for fresh food-derived waste. The project aims to address two important environmental problems: the management of large quantities of food waste and the presence of non-biodegradable plastics in the environment, particularly in the marine environment. The EMERG is in charge of assessing the environmental sustainability of the proposed technology. The EMERG is also investigating a sustainable material (Biosh-Calcio) for absorbing carbon dioxide and volatile organic compounds in closed-circuit breathing systems for underwater, firefighting, fire and medical applications. Currently, such time is used in three systems: 1) it is a substance with neutral properties in use and health risks. The composite developed by the Group allows the absorption of carbon dioxide and the absorption of harmful organic compounds generated by the human body while avoiding health risks. Finally, as part of the MARLES project (2019 - 2022) led by V. I. I. Costa (CNR Programme), who deals with improving the environmental quality conditions of the sea and coastal areas through the use of sustainable and innovative technologies and approaches, the Group worked on demonstrating the feasibility of new technologies in the field of prevention, recovery and treatment of marine waste, approving a process system for plastic materials recovered from the sea.

possible fields of innovation, with the goal of mitigating the effects of climate change through circular practices of recovery and treatment of contaminants and critical materials. For instance, the BIOCOMB project aims at implementing and transferring innovative soil management techniques to wine producers, such as the application of new organic soil improver matrices (compost and biochar), which enhance CO₂ storage, soil fertility and water retention capacity, reduce the release of pollutants into the environment, induce a higher resistance to diseases, for a sustainable viticulture. The NET-FULLS project, started in 2022 and financed under the Horizon Europe Energy programme, develops an innovative pathway to produce carbon-negative biofuels from low-value biogenic residues (such as lignocellulosic wood from forests) through a combination of thermochemical conversion, separation of hydrogen from syngas, recombination of the residual gas, biotechnological conversion of CO₂ to methane and carbon sequestration in biochar. Another project (STRIDENTE, a regionally funded project starting in autumn 2023) will investigate a process for recovering nitrogen and phosphorus from biodegradable residues to form a fertilizer, creating a slow-release fertilizer that can replace mineral and synthetic fertilizers, as promoted by the new European fertilizer regulation strategy. In general, the Group's objective is to develop materials obtained from carbonaceous substances and possible mineral components (metals, shells, etc.), second-generation carbon, whose composition and preparation is designed in terms of chemical, physical and biological action for uses such as agriculture, wastewater treatment and industrial process control, contaminant removal, mechanobiology and construction. Carbonaceous substances and the mineral component can be obtained from production waste of biological, and thus renewable, origin or fossil origin. The qualification "second generation" indicates both the production of carbon from waste, in a circular economy perspective, and the technological development related to the design, engineering of the materials obtained.

... NOT JUST SEA
The EMERG studies the possible applications of agro-industry derived composite materials in all

Web site: <https://tsh.unibo.it/environmental-management-research-group/>

Editorial Feature

BioLaMer, has captured the spotlight in the recent newspaper published by the University of Bologna's Ravenna campus.

In this article, **BioLaMer** partners **Prof Serena Righi** and **Dr Martina Pelliconi** provided a concise summary of the **BioLaMer's** research work, including its duration and the primary environmental challenges it addresses under the department Environmental Management research Group (**EMRG**). This press release aims to underscore the project's reach to aspiring students and the wider public.

While **BioLaMer** is entering its second year of action, the progress of the project can be evaluated from its deliverables and milestones accomplished;

- Development and delivery of an early prototype of the food-eating BSF larvae plant/bioreactor.
- Development of larvae pre-treatment protocols and processes to synthesize biomolecules such as fats, oils, proteins for using them as feedstocks for biopolymer production and certain platform chemicals for niche applications.
- Development of an all-natural super-absorbent material for food packaging and other hygienic applications.

We have also taken a significant step forward in this journey by initiating the patent application process for our innovative technology.

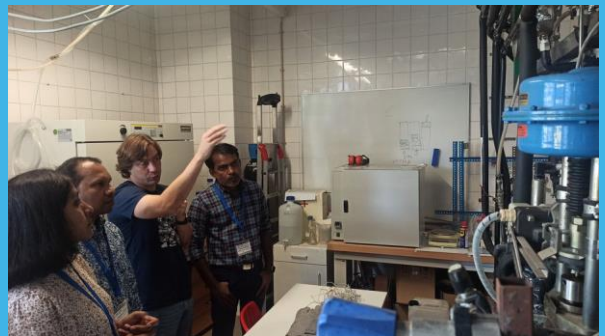
Partner Visit & Knowledge Sharing



The TCD team visited the partner laboratory at NOVAID, Lisbon, Portugal for discussions on their joined action in developing PHA production technology.

Through laboratory visit, demonstration of working experiments,

and technical discussions, we exchanged valuable knowledge and ideas for the next steps in the technology development.



Public Outreach

BioLaMer project has participated in the EUROPEAN RESEARCHER'S NIGHT 2023 through our partner NOVAID, Lisbon, Portugal.

In this event, **Prof Maria Reis, Dr Monica Carnevalheira** and **Dr Bruno C Marreiros** showcased the scientific research objective & work of the project,

which mainly focuses on sustainable, biodegradable and bio-based products, heading towards a circular and bio-based economy.



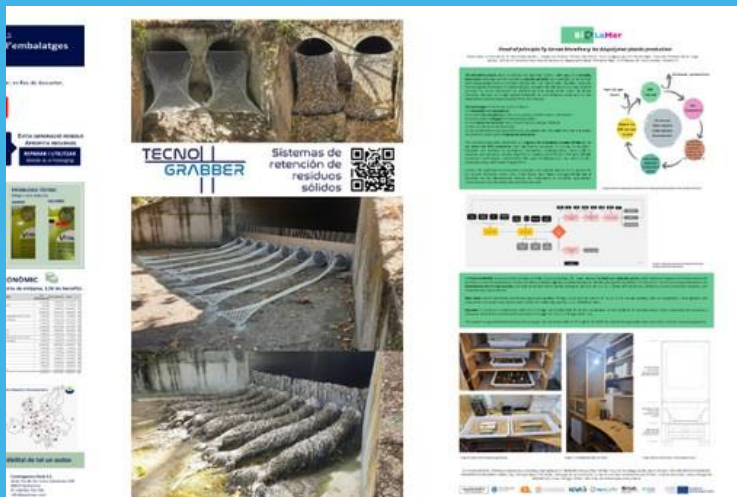
Visual Dissemination

BioLaMer highlighted a milestone in its first phase through a combination of a poster and the public address at the 7th Congress Recuwaste - Resources and Life with the topic **“THE CIRCULAR ECONOMY OF RESOURCES: ANTICIPATING THE FUTURE”** in **Tecnocampus Mataro**, Barcelona, Spain, which was held from the 14th - 15th November, 2023.

BioLaMer partner **Ms Nada Tozija from TransfoLAB BCN** has exhibited the poster and presented the circular solution with the first prototype scheme of the Black Soldier Fly larvae bioreactor.



BioLaMer project was one among the shortlisted proposals for the **“Alfonso Mailo Prize”**.



Workshop Engagement

BioLaMer was highlighted in the workshop focusing on the significance of LCA in shaping the ecodesign of chemical processes through our partner UNIBO, which was held on the 25th January 2024 in Milan.

At this event, **Dr Martina Pelliconi** and **Prof Serena Righi** delivered an oral presentation titled “**The importance of Life Cycle Inventory accuracy in the ecodesign of an innovative PHA production biorefinery**”. During their speech, they presented the innovative aspect of the **BioLaMer** project in terms of its PHA biopolymer production potential and emphasized the need of implementing the ecodesign principles at an early stage of the development through low TRL (Technology Readiness Level) LCA studies, with the aim to minimize environmental burdens not only at the laboratory scale, but also at higher TRLs.



Oral Presentation (Invited)



Thank You

See you in the next edition of our newsletter

Stay Connected with us

<https://biolamer.eu/>



Our project has been presented at the “International Conference on Multidisciplinary Approaches to SDGs and International Partners Meet 2024” held at Cochin, Kerala, India from the 10th –13th January, 2024 by **Dr Siby Padmanabhan**. Through this invited talk, we expanded the reach of our project by connecting with researchers and professionals in India.

BioLaMer Partners



Dr Sibu Padmanabhan – Project Coordinator
Prof. Michael Morris – Co-Investigator
Advanced Materials and BioEngineering Research (AMBER) Centre & School of Chemistry, Trinity College Dublin, Dublin, Ireland



Prof Serena Righi – Associate Professor
ALMA MATER STUDIORUM– UNIVERSITA DI BOLOGNA– UNIBO, Italy .



Dr Jorge Santos - CEO
AquaInSilico LDA, Lisbon, Portugal



Dr Ana Rita Farias
HEI-Lab Digital Human-Environment Interaction Lab, COFAC, Lusofona University, Lisbon, Portugal



Prof Rui Oliveira - Associate Professor
Prof Maria Reis - Full Professor
NOVAID FCT, Lisbon, Portugal



Ms Neda Tozija – Co founder
TransfoLAB BCN (centre for trash investigation), Barcelona, Spain



Ms Nisha Thomas - Director
Soclinetech Solutions & Services, Cork, Ireland



Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin



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