LIFE RESTART
Reuse of bEer SpenT grAin foR bioplasTics
LIFE21-ENV-IT-LIFE RESTART/101074314

Co-funded by
the European Union

LIFE RESTART - Reuse of bEer SpenT grain foR bioplasTics

15/01/2026

Giacomo Pinaffo – Project Manager - *g.pinaffo@fdcmessina.org*

LIFE RESTART
Reuse of bEer SpenT grAin foR bioplasTics
LIFE21-ENV-IT-LIFE RESTART/101074314

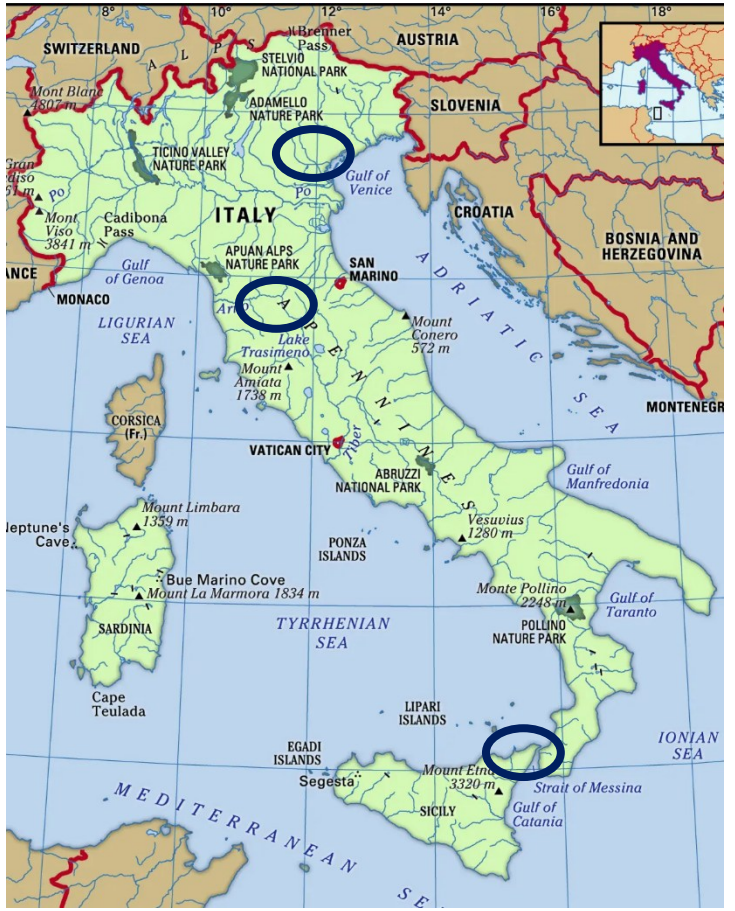
Co-funded by the European Union

INTRODUCTION

- Project title: LIFE2021-SAP-ENV-101074314-LIFE RESTART
- Project location: ITALY
- Total budget: 2,95 M€ (EC co-funding: 60 %)
- Duration: 51 months (closing 31/12/2026)
- Coordinator: Fondazione MeSSInA
- Partners: 6

CROSSING

GIARDINERIA ITALIANA



THE PROBLEM(S)

THE BEER INDUSTRY

- Every 1hL of beer produced generate 20 kg of Beer Spent Grain (BSG)
- 85% of the total by-products obtained from beer production
- Over 6.4 Mt of BSG waste are produced yearly in Europe
- 70% of BSG is used as feed, around 10% goes to produce biogas, and the remaining 20% is landfilled
- Every ton of BSG landfilled releases 513 kg CO2 equivalent of greenhouse gases (=656.640 ton yearly in EU)
- According to a 2019 survey:
  - an increasing number of Farmers (> 60% in Nord EU) are declining to take BSG as animal feedstock
  - none of the breweries own technologies for on-site storage of the spent grain
  - failure of BSG regular disposal would force the brewery to halt production
  - BSG waste disposal costs are between 75-100€/t in EU.

+

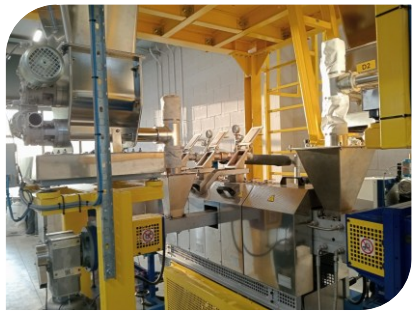
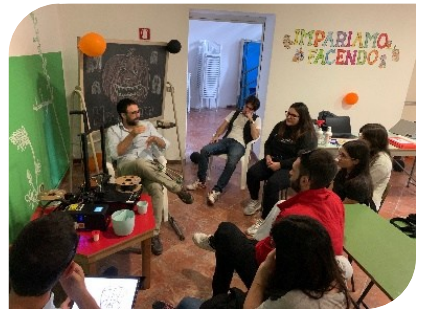
THE PLASTIC CONSUMPTION

- Global consumption of plastic is accelerating. In western Europe, the average annual plastic consumption is around 150kg per person — more than twice the global average of 60kg. Annual emissions related to plastic production in the EU amount to around 13.4 million tonnes of CO2
- Use of agricultural land to produce precursors for virgin bioplastics

OUR PROPOSAL TO TACKLE THE PROBLEMS

- Production of biodegradable and compostable plastics using BSG as a filler, providing an alternative option to BSG disposal, to Fossil based Plastic (FbP) production and to the use of agricultural land for the production of virgin bioplastics.
- Focus at the same time on relevant social issues, thanks to the engagement of the social economy sector:
  a) The production plant is located in a marginalized village affected by depopulation and lack of economic opportunities.
  b) The production site was previously abandoned; it has been fully regenerated and will host: an educational centre on biomaterials and ecological transition; a research centre which keeps experimenting on bioplastics; a green fab lab with 3D printers to engage local young people in creative workshops. The plant will also become the central hub of a local Renewable Energy Community thanks to its solar power plant.
  c) The company managing the plant is a social enterprise: it is creating specific job opportunities for disadvantaged people and the surplus generated will be reinvested in the development of the research center and in local actions to tackle education poverty.



LIFE RESTART

Reuse of bEer SpenT grAin foR bioplasTics

LIFE21-ENV-IT-LIFE RESTART/101074314

Co-funded by the European Union

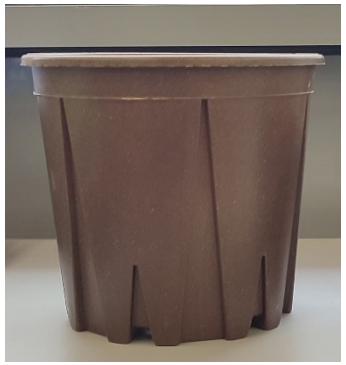
Wet BSG

Dried BSG

BSG filler

BSG compound

Bioplastic product



Drying of BSG

Dehumidification and pulverisation of BSG

Extrusion of BSG with a matrix bio-polymer and additives

Injection moulding to produce final products

Wastewater

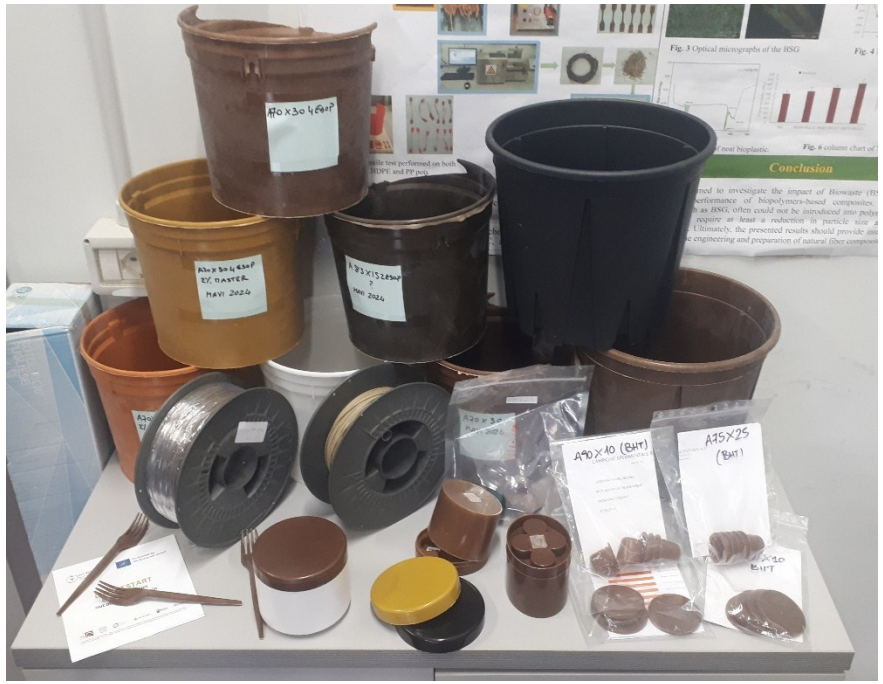
Water treatment and reuse

LIFE RESTART
Reuse of bEer SpenT grAin foR bioplasTics
LIFE21-ENV-IT-LIFE RESTART/101074314

Co-funded by the European Union

WHAT WE EXPECT TO ACHIEVE AT THE END OF THE PROJECT

- 7 new green jobs created
- 600 tons of wet BSG produced by the partner brewey will be recovered for the production of bio compounds
- ca. 120 tons of BSG filler are obtained: this will enable the production of ca. 300 tons of bio compound
- recovery of wastewater from BSG drying: 600 tons of wet BSG processed by BM in the last year of the project contain about 80% water (480t)
- EFSA application for the incorporation of BSG in the Positive List of Regulation (EU) 10/2011



OUR LEGACY

REPLICATION

- The business case, based on the pilot factory, will be modelled and made adoptable and customizable by other organizations willing to replicate the same circular and social economy model.
- The presence, among the project stakeholders, of Heineken Italia SpA and financial partners (Banca Intesa, main national banking group and active in many European countries, as well as FEBEA, European Federation of Ethical and Alternative Banks), will facilitate access to raw material (BSG) and finance for organizations willing to replicate the model.

TRANSFERABILITY

- The technology developed through the LIFE RESTART project has been successfully tested on other agri-food production chains, replacing the beer spent grains with other organic waste or by-products (olive pomace and coffee silverskin).