

# life**brewery**

from brewery to fish feed

## LAYMAN'S REPORT



**New Strategies for Improving  
the Sustainability of Breweries:  
Full Waste Recovery for  
Aquaculture Feed**

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## CONTEXT

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European Union is the 2nd largest beer producer in the world, (383 million Hl in 2014), ahead of USA, Brazil and Russia, with more than **6,500 breweries**. Spain is the 4th EU producer (33 million Hl and 332 breweries).

Beer production has a **double environmental impact**: 1) beer production and 2) wastes management. The largest volume are BSG -Brewer Spent Grain- (80 % of total solid by-products), followed by BY -Brewer Yeast- (10 %). So, given EU beer production in 2014, more than **6 million tons of BSG** (15-20 kg of BSG per 1 Hl of beer) and **0.8 million tons of BY** (1.5-3 kg of BY per 1 Hl of beer) were generated.

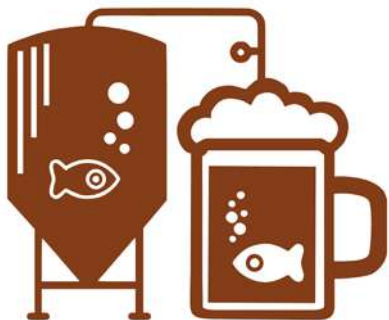
On the other hand, aquafeeds are formulated to contain all the essential nutrients that fishes need to keep healthy. They are highly dependent on marine ingredients: fish meal and oil. Hence, alternative ingredients which successfully replace these marine ingredients are required to result in **sustainable and economical feeds**.

Public strategies seek to advance into environmental preservation and, thus, into the quality of life of citizens, by protecting biodiversity and the environmental services provided by ecosystems, by properly managing of the generated wastes, by ensuring a clean and healthy environment and by promoting the responsible use of natural resources by business, government and public consumption. This project will **contribute to fulfil European environmental policy and legislation**.





## MAIN OBJECTIVE



The aim of this project is to demonstrate the feasibility of an **innovative, sustainable and integrated Valorisation Scheme** to **recover the brewer by-products** in a representative EU producing region as case study, through their up-grading at full scale as aqua-feed ingredients.

# WHAT FOR?



01



02



03

**01. An increase in the Environmental Efficiency and Competitiveness of brewing sector** by improving the image of environmental protection and sustainable use of resources and by minimizing costs of waste management.

**02. An increase in the EU Aquaculture Sustainability** by providing 2 sustainable raw materials from spent grain and yeast for aquaculture feed which decrease the dependence of fish meal production.

**03. Contribution to the Society Awareness** towards the environmental protection and efficient use of the resources.

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# TECHNICAL PHASES

## A1.

Setting the **Stakeholders' table**.

## B1.

**Pre-industrial optimization** of processes for obtaining meal & aquafeed prototypes.

## B2.

**Design of a Valorisation Scheme** including all stages of the Value Chain and Replicable to any European Scenario.

## B3.

**Demonstration** of the Valorisation Scheme applied to a case study.

## B4.

**Feasibility** of the Implementation in an industrial reference scenario.

## B5.

**Replicability and Transferability** of the Valorisation Scheme at European level.

## D1.

**Public Awareness** and Dissemination of results.

# EXPECTED RESULTS



**01. Four new raw materials** for aqua-feed (brewers' spentgrain and yeast).

**02. An Exploitation plan** to recycle most of byproducts in the case study region (Spain).

**03. Replication and Transference** to other EU regions with similar challenges.

**04. Reducing 25 % of the environmental impact** associated with aqua-feed production by replacing at least 15 % of the fish meal.

**-25%**  
Environmental  
impact



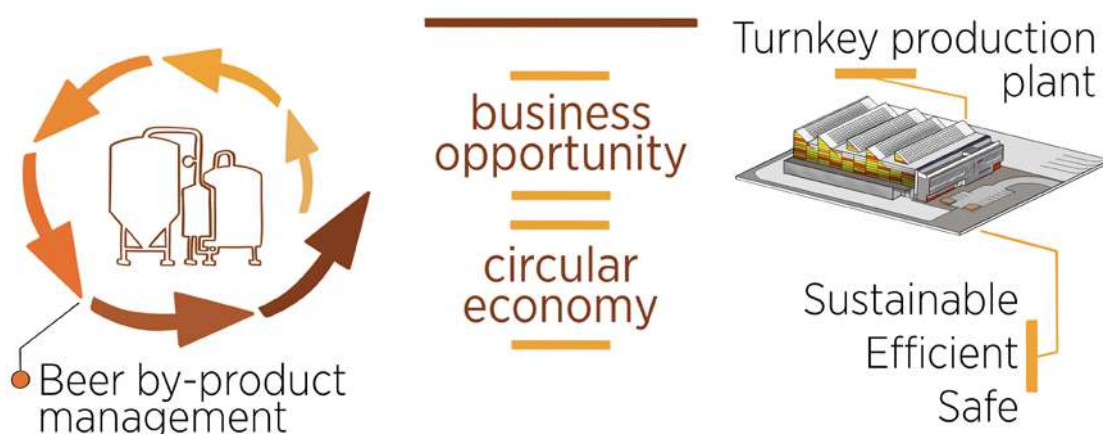
## ACHIEVED RESULTS

**An innovative, sustainable and safe technological solution has been developed; replicable to any scenario** and the capacity to develop a turnkey plant.

An enzymatic hydrolysis allows to obtain at the same time high value compounds for human food and a new and more digestible ingredient for aquaculture feed, giving a high value to the beer by-products.

The stabilisation step combines highly efficient technologies to ensure nutritional quality and safety, while guaranteeing the economic viability of the ingredients obtained.

A production plant has been eco-designed following the ISO 14006 methodology, which is flexible and adaptable to any scenario and dimension.







# TURNKEY SOLUTION

## INNOVATIVE AND SAFE

- Demonstrated process on at semi-industrial scale.
- Suitable ingredients for food and feed.
- Validated products in their final applications.

## CONSORTIUM CAPACITIES

- Customized solution.
- In-house technology.
- Detailed engineering.
- Turnkey solution.

## FLEXIBLE

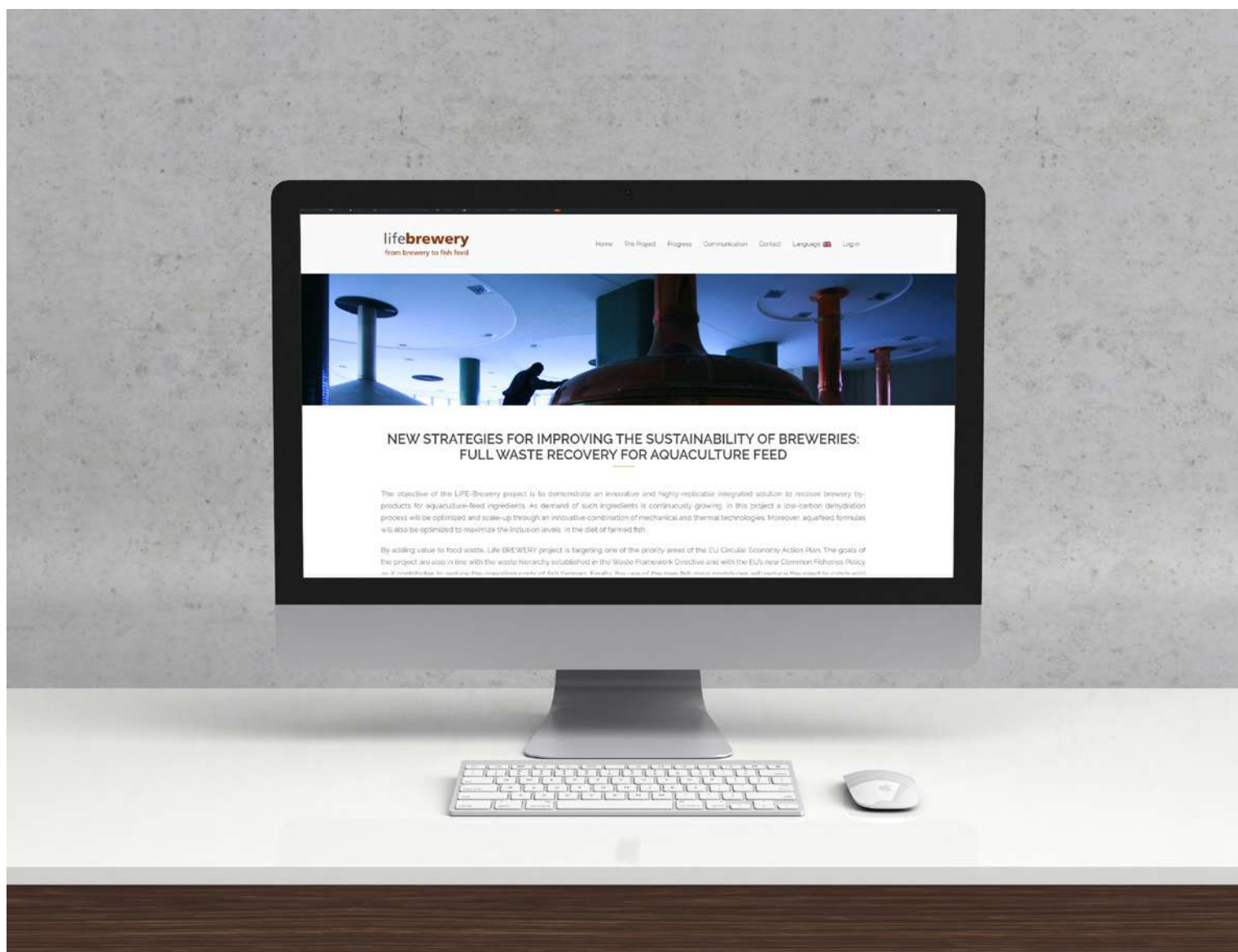
- Replicable to any European region.
- Adaptable to different.

## SUSTAINABLE

- Circular economy based solution.
- Eco-designed process and production.

## HIGH EFFICIENCY

- Optimized energy consumption.
- Adaptable to any renewable energy source.



## COMMUNICATION & NETWORKING

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Throughout the project, different communication materials and actions have been developed. The **WEBSITE** has been the main platform where all the information related to the project has been made known. In the different sections of the menu you can find all the updated information about the project and its progress.

In addition to the website, two **leaflets** have also been designed; one with information about the project, and the other, more commercial, about the technological solution developed.

A 3-minute explanatory **video** has also been created, which shows the problem of brewery waste and tells how LIFE BREWERY provides a solution by creating business opportunities.

On the other hand, five **press releases** have been sent to extend the reach and visibility of the project.

With regard to the scientific community, six **scientific and technical articles** have been written and the project has participated in **international events**. These events have provided an opportunity to meet other projects, organisations and companies that have allowed **NETWORKING** and to take advantage of synergies and knowledge.





## IN NUMBERS...

**6**

scientific and technical articles

**25**

related projects networked with

**40**

company and/or organisations contacted

**18.000**

website pages viewed

**30.000.000**

of people reached through press releases

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*"A further step towards the  
**green economy**, generating **new  
value chains** and solutions that  
contribute to a **healthier** and more  
**sustainable society**"*



The LIFE BREWERY project has received funding from the LIFE Programme of the European Union.