

# MULTI-STR3AM

Microalgae-biorefinery as source of novel foods, nutraceuticals and food additives

**B + F H E** Biotechnology to build a brighter future  
Food, Health and Environmental Applications

Mariana Doria | 10 May 2021



A sustainable **multi-strain, multi-method, multi-product** microalgae biorefinery integrating industrial side streams to create high-value products for **food, feed and fragrance.**

Budget € 9,1 Mi  
EU contribution € 6,6 Mi

# Drivers

## Regulation

New **ECHA** proposal to **restrict microplastics intentionally added to consumer goods** is creating pressure on manufacturers to **switch to degradable alternatives**, impacting the microencapsulation area.

## Market

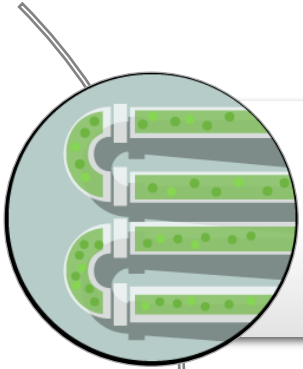
Rising **societal awareness of environmental issues**, conscientious **consumers and businesses** are increasingly seeking sustainable, bio-based raw materials that can be produced without depleting natural resources.

## Industry

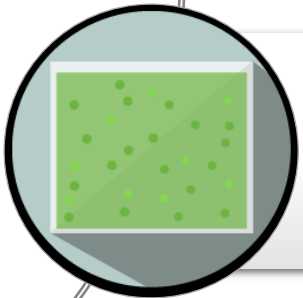
A growing demand for **alternative sources** of raw ingredients represents a **business opportunity** for the microalgae sector.

Critical need to shift to a sustainable means of producing food, feed and fragrance raw materials.

# Why microalgae?



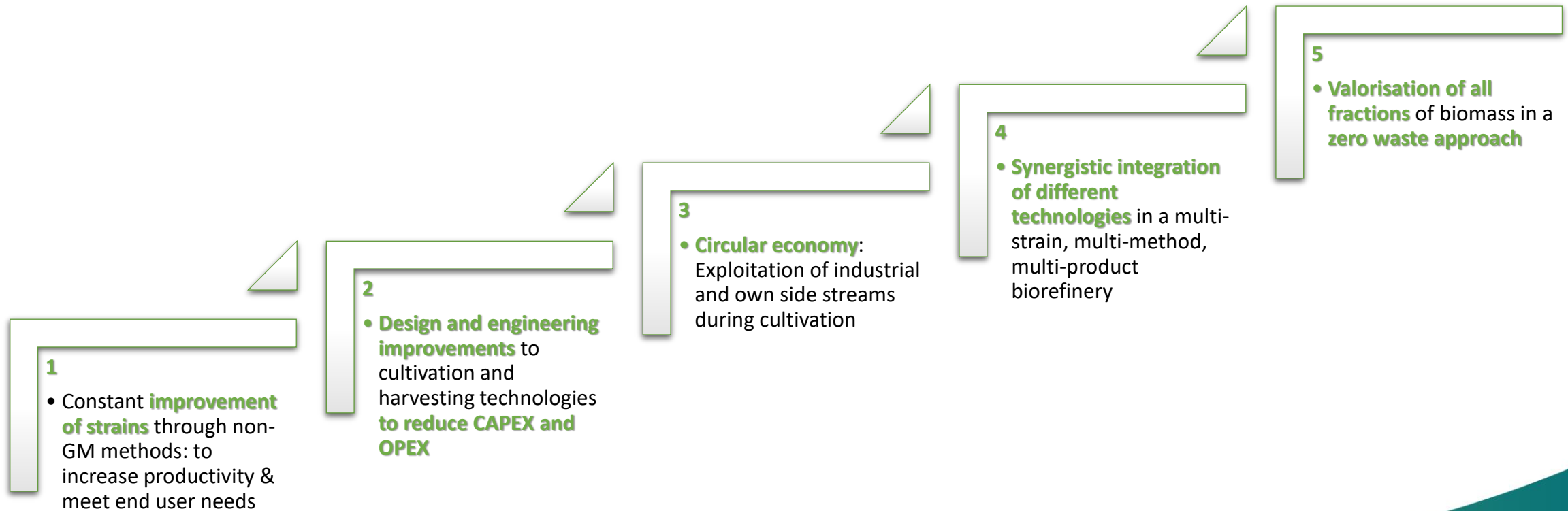
Represent a **promising solution** to address the growing recognition that current agricultural and manufacturing practices are causing irreparable environmental damage.



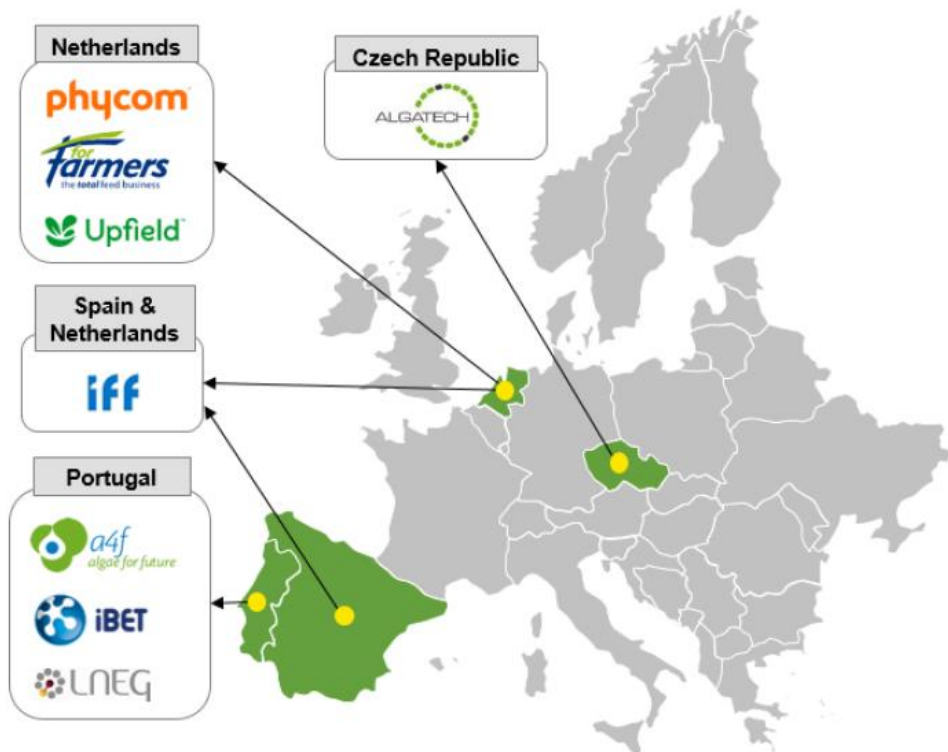
Have a **vast biosynthetic potential** and are a **rich source of lipids, protein** and high-value compounds such as **pigments**.

- Despite these advantages, they are **underexploited as a crop**.
- This is due to **barriers of scale**, which mean that microalgae products struggle to achieve the same economies as conventional products, such as palm oil or soybean.

# How to reduce costs, increase scale and boost sustainability?



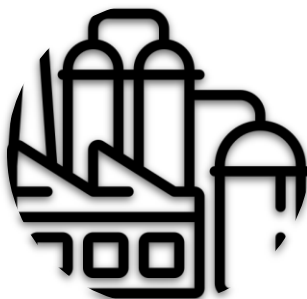
# Consortium



# MULTI-STR3AM Impacts



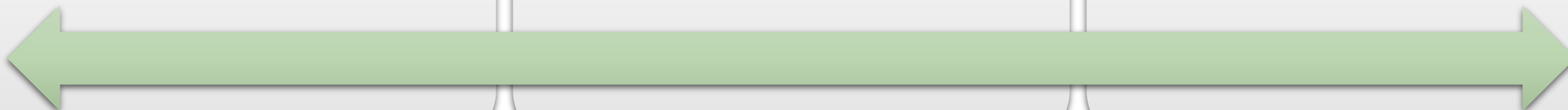
**Demonstrate the validity and feasibility** of using a **multi-refinery** approach to microalgae processing and valorisation.



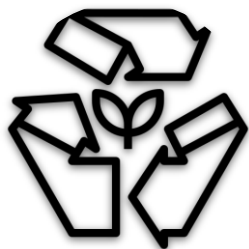
**Create four new cross-sector interconnections:** chemical; feedstock, food, feed and fragrance sectors, providing compounds and ingredients.



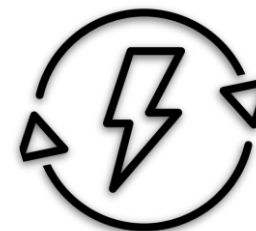
**Establish three new sustainable and economically viable value chains**, by linking new biomass feedstock sources with novel products.



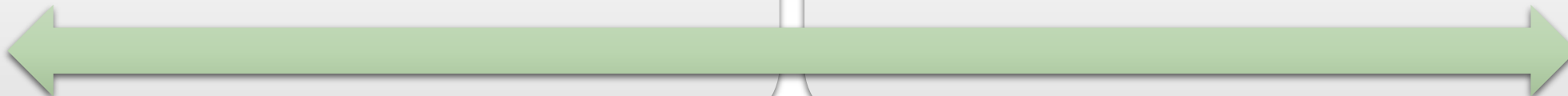
# Environmental benefits



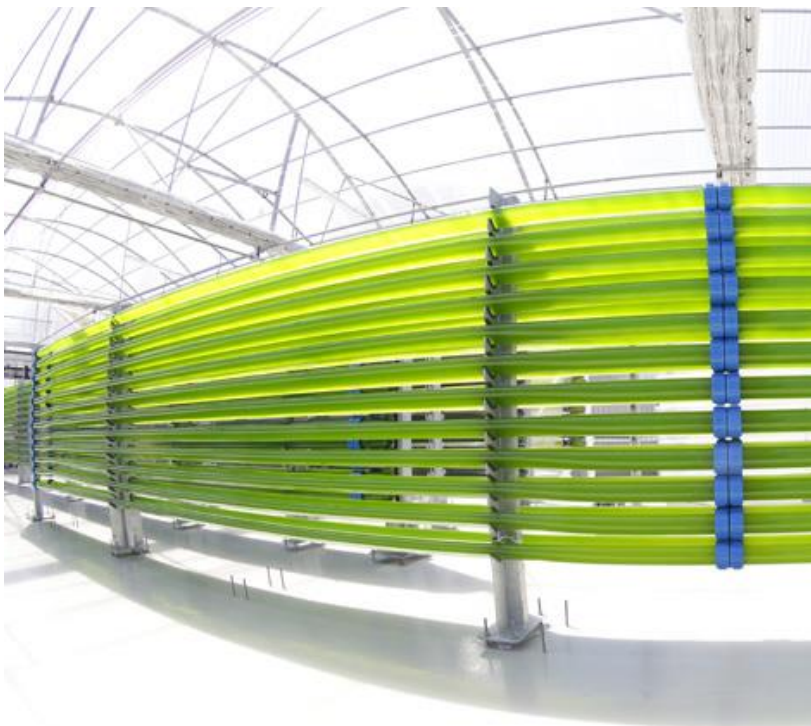
**Increase** overall **resource efficiency** by at least 20% over conventional cultivation/processing approaches.



**Reduce** associated **energy consumption and GHG emissions** by at least 20% over state-of-the-art.



# 7 Consumer products



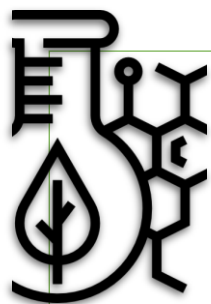
**Protein and small organic compounds** as building blocks for the **fragrance industry**

**Lipids** for edible **spreads**



**Protein, carbohydrates and lipids** for **feed ingredients** for poultry, pigs and ruminants

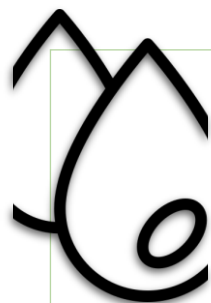
# Food industry application



Protein-pigment as a natural food colouring



Omega-3/omega-6 enriched oils



Lipids and phospholipids as alternatives to palm oil

# Thank you

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