



Sustainable Blue
Economy Partnership

WHO IS WHO BROCHURE

**Thematic Portfolio 2:
Innovations for boosting
sustainability in marine
algae cultivations and
circularity in the blue
bioeconomy**



Co-funded by
the European Union

EUROPEAN PARTNERSHIP

What is the Thematic Portfolio?

The Thematic Portfolio of projects is a two-year networking initiative (2026-2028) part of the Sustainable Blue Economy Partnership. Designed to bring together ongoing R&I projects from across Europe, the primary goal of this initiative is to boost collaboration, knowledge sharing, and the development of common outputs. The Thematic Portfolio projects, either co-funded by the Partnership or other European funding streams, address a common general theme focusing on the Intervention Area “Blue Bioresources” outlined in the Partnership Strategic Research and Innovation Agenda (SRIA):

“ Innovations for boosting sustainability in marine algae cultivations and circularity in the blue bioeconomy

The initiative includes a diverse community of R&I projects, selected through an open call for expressions of interest in 2025. The Thematic Portfolio was officially launched with a kick-off event on February 12th, 2026, in Bucharest, during the Partnership halfway meeting.

Discover the Thematic Portfolio projects

This brochure introduces the projects involved in the Thematic Portfolio, and:

- **Who they are:** The experts and organisations
- **What they do:** Their contributions to the blue economy
- **Why they joined the Thematic Portfolio:** Their motivations and visions



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[Thematic Portfolios - Sustainable Blue Economy Partnership](#)

Thematic Portfolio Members

Acronym	Project Title	Main Contact	Funding	Website
<u>BIOVAL</u>	Microalgal biomass valorization for sustainable production of functional food and feed ingredients	Giovanna Romano	SBEP Call 2	https://www.bioval-project.eu/
<u>BLUEBOOST</u>	Culture of a wide range of low trophic species to boost sustainable production of Blue Food and reduce environmental footprint	Neil Duncan	SBEP Call 1	https://www.blueboost.eu/
<u>SEAGROW</u>	Seaweed Ecosystem Aquaculture for GROWth and Sustainability	Natalia Ospina-Alvarez	CINEA, EMFAF	https://www.seagoinggreen.org/seagrow-home
<u>BLUE BIO BOOST</u>	Boosting seaweed farming through better utilization of genetic resources	Åshild Ergon	SBEP Call 1	https://bluebioboost.eu/
<u>CIRCALGAE</u>	CIRCular valorisation of industrial ALGAE waste streams into high-value products to foster future sustainable blue biorefineries in Europe	Amparo Jimenez Quero	Horizon Europe	https://www.circalgae.eu/
<u>MARMADE</u>	MARine bioMass valorizAtion for fooD and fEed innovation	Sauro Vittori	CBE-JU	https://marmade-project.eu/
<u>SEALGAEPOWER</u>	Sustainable development of microalgae-based ingredients using waste streams from aquaculture and seafood processing industry	Cornelia Spetea Wiklund	SBEP Call 2	https://www.sealgaePOWER.eu/



Thematic Portfolio Members

Acronym	Project Title	Main Contact	Funding	Website
<u>SEAREFINERY</u>	Improved Valorization of Marine Sources and Processing Waste for Resource Efficient Blue Food/ Feed and Environmentally Sustainable Materials Development	ZEYNEP CETECIOGULU GUROL	SBEP Call 1	https://www.kth.se/searefinery/searefinery-1.1347380
<u>SEAFOODTURE</u>	Integral valorisation of seaweed biomass for the development of sustainable, high nutritional quality food products	Marta Martinez Sanz	SBEP Call 1	https://seafoodture.eu/
<u>ALGAEPROBANOS</u>	Accelerating algae product developments in Baltic and North Sea	Ferdinand Bulmer	Mission Ocean and Waters	https://algaeprobanos.eu/
<u>ALLIANCE</u>	European microalgae alliance (alliance): innovative, safe, and sustainable multi product biorefineries for a blue biobased economy	Iago Teles	CBE-JU	https://www.wur.nl/en/chair-groups/bioprocess-engineering/research/microalgal-biotechnology



BIOVAL

Microalgal biomass valorization for sustainable production of functional food and feed ingredients

Keywords:

Microalgae, functional food ingredients, anti-obesity, biorefinery, solvent-free extraction, biomass valorization

Lead organisation:

Stazione Zoologica Anton Dohrn

Project duration:

27/8/2025-26/8/2028

Funding source:

SBEP Call 2

Sea-basins:

North Sea, Mediterranean Sea, Atlantic Ocean



GIOVANNA ROMANO

Coordinator

Areas of expertise: Microalgal biomass valorization for sustainable production of functional food and feed ingredients

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<https://www.bioval-project.eu>



[BIOVAL SBEP Project](#)

PROJECT SUMMARY

The main goal of the project BIOVAL is to optimise the cultivation of microalgae to produce food supplements, support sustainable aquaculture, and reduce environmental impact at the same time.

Despite their microscopic size, microalgae form the foundation of life in our oceans and contribute to oxygen production as much as tropical forests. They are also rich in several beneficial compounds and represent a valid alternative to other sources, such as terrestrial plants. They do not require many nutrients as they grow using sunlight, water, and carbon dioxide, thus reducing atmospheric CO₂.

From microalgae, we will extract natural oils containing compounds with promising health benefits, particularly anti-inflammatory properties, which may help prevent metabolic diseases. Today, many people get these compounds from fish oil, the well-known omega-3, but fish themselves obtain them from algae in the first place. So instead of catching more fish, we will go directly to the original and more sustainable source.

Equally important is how we will extract these compounds. Traditional processes often rely on harsh chemicals. Our work will develop greener extraction methods that are safer both for people and the environment.

Another important goal of our project is achieving a “zero waste” model. After the valuable oils have been extracted, the remaining biomass is still rich in proteins and carbohydrates. Rather than discarding them, we will use them to integrate feed for farmed fish. And what is left after can become a natural biofertiliser for agriculture. In other words, the same biomass may support human health, sustainable seafood production, and agriculture, with nothing going to waste.

To make this practical, we will grow them in modular photobioreactors: transparent panels where algae grow using light. They can be installed locally, allowing companies to produce algae on site, reducing transport, emissions, and supply problems.

Finally, we will measure the environmental footprint of the whole process to ensure its sustainability. In simple terms, our project looks at how microscopic algae can help us produce healthier supplements, reduce pressure on oceans, and create less waste.



BIOGRAPHY

Dr. Giovanna Romano holds a degree in Biological Sciences from the University of Naples Federico II. She joined the Stazione Zoologica Anton Dohrn as a biochemistry fellow, where she worked on bioactive peptides from marine organisms. Since 2004, she has served as Senior Researcher, leading research activities in the fields of chemical ecology and marine biotechnology. Her work focuses on bioactive compounds produced by marine microalgae and their ecological roles, as well as their potential biotechnological applications. Her research interests include the elucidation of metabolic pathways involved in the biosynthesis of high-value molecules.

Dr. Romano is currently coordinating the SBEP-2024 project BIOVAL, ensuring effective communication and coordination among project partners. Within the project, she will lead activities aimed at optimizing cultivation processes to maximize the yield of bioactive products and at identifying biosynthetic pathways of interest through molecular biology approaches.

MOTIVATION TO JOIN THE THEMATIC PORTFOLIO

The motivation to join the Thematic Portfolio activities is to strengthen collaboration with other leading institutions and industry partners, fostering synergies that may accelerate technology transfer and establish bioprocesses based on marine microalgae that may improve resource efficiency and establish replicable models in a circular bioeconomy framework.

The team has the potential to contribute with expertise in strain development and genetic engineering, sustainable, circular and low-impact Algae Cultivation Systems, sharing advanced methodologies in Computational Fluid Dynamics (CFD), process scale-up, and Life Cycle Assessment (LCA). Joining the Thematic portfolio could also contribute to the harmonisation of best practices across different European marine basins—Mediterranean, Atlantic, and Northern—and to reinforce Europe's leadership in sustainable blue biotechnology.

The participation will also enhance international networking and integration into new collaborative research and innovation initiatives within the SBEP ecosystem.



BLUEBOOST

Culture of a wide range of low trophic species to boost sustainable production of Blue Food and reduce environmental footprint

Keywords:

Aquaculture, integrated multitrophic aquaculture, low trophic aquaculture, macroalgae, circular economy, blue foods, life cycle assessment

Lead organisation:

Institute of Agrifood Research and Technology (IRTA)

Project duration:

1/4/2024-31/3/2027

Funding source:

SBEP Call 2

Sea-basins:

Mediterranean Sea, Baltic Sea, Atlantic Ocean



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<https://www.bioval-project.eu>



[BLUEBOOST Project](#)

PROJECT SUMMARY

BLUEBOOST aims to demonstrate that co-culture of a wide range of low trophic species with established species can boost current European aquaculture of blue foods and feeds while reducing the environmental footprint and moving towards a carbon-neutral aquaculture blue economy. The consortium consists of partners from eight countries (Spain, Portugal, Poland, Italy, Brazil, Sweden, UK, Finland) and three seas / oceans (Atlantic – north and south, Mediterranean, Baltic). Partners are experts in the ecology, hydrobiology, culture of low trophic species, integrated multitrophic aquaculture (IMTA), economics and life cycle assessment (LCA) of blue food and feed production.

BLUEBOOST aims to provide knowledge based solutions that will enable the aquaculture industry to overcome bottlenecks that inhibit Governments and businesses, following an impact pathway that can increase the volume and diversity of aquaculture products, reduce environmental footprint towards a carbon-neutral economy, raise the circularity and competitiveness of the blue economy, provide new products, restore ecosystems, create jobs and increase ecosystems resilience against climate change. The partners will work with six different IMTA systems and a wide range of species from different trophic levels to evaluate the use of waste streams from traditionally farmed species to provide nutrients and feed for low trophic species. The nutrients and carbon fluxes will be mapped, and the environmental footprint of six systems with and without IMTA, determined employing LCA to demonstrate the benefits and trade-offs of incorporating extractive low trophic species in combination with traditional aquaculture species.

Self-financed partners will examine new products, use of macroalgae for sustainable food packaging and test low trophic blue feed ingredients in the diets of marine organisms. To restore ecosystems, threatened oysters species will be farmed in Italy and Spain, whereas coastal ponds of the Ebro Delta will be offered as new aquaculture sites and protection against climate change related sea level rise and storm intensification.

We envisage that BLUEBOOST will involve (co-creation/co-design) and impact all stakeholder levels providing societal value creation such as: (a) technical advances that provide new sustainable production methods and products; (b) reduced environmental footprint of blue food and feeds; (c) environmental restorative aquaculture practices; (d) improved economics with increased volume and diversity of production; (e), policy-making to provide conditions for and to drive desired change and (f) low carbon products and business investments to meet consumer demand. This win-win scenario will deliver improved diversification of blue foods and feeds and, at the same time, increase production volumes and quality, to improve the competitiveness of European and Brazilian aquaculture while reducing the industries environmental footprint.

BIOGRAPHY

Neil Duncan enjoys working in applied research in control of fish reproduction and fish culture in general. Neil holds a BSc in Marine Biology and Oceanography from Bangor University and a PhD in Aquaculture from the University of Stirling. Neil is a Senior Research in IRTA with over 30 year working with Aquaculture. His role in BLUEBOOST is Coordinator of the consortium and the work in IRTA with Integrated Multitrophic Aquaculture (IMTA) in Mediterranean coastal ponds situated on salinated land on the Ebro Delta.

MOTIVATION TO JOIN THE THEMATIC PORTFOLIO

BLUEBOOST is motivated in participating in the second Thematic Portfolio entitled “Innovations for boosting sustainability in marine algae cultivations and circularity in the blue bioeconomy”, to participate in regrouping projects under this topic and related R&I activities to attract complementary projects and to build a strong portfolio responding to the following targeted objective: “To address challenges and opportunities associated with further development and expansion of marine algal production for a low-impact, productive and circular marine bioeconomy”.

BLUEBOOST is active in a range of the proposed areas of interest and, therefore, motivated to participate in networks in the following areas of the call:

2.2.1 Strain development and genetic engineering, particularly, Macroalgae such as (1) Low impact in terms of e.g., carbon footprint reduction targets, (2) To develop selective breeding for faster growth, disease resistance, or specific biochemical traits.

2.2.2 Sustainable, circular and low-impact Algae Cultivation Systems. To develop innovative Low Trophic Aquaculture (LTA) / Integrated Multi-Trophic Aquaculture (IMTA) systems (for macroalgae) considering challenges related to impact of climate change (acidification, temperature) on yield and composition. Other environmental stressors such as effects on local biodiversity, water quality parameters, (nitrogen/phosphorus loading, dissolved oxygen levels), benthic habitat modification, and carrying capacity thresholds for cultivation areas, are also to be considered. To include circularity in cultivation systems: Sustainable nutrient sourcing and recycling. To develop sustainable and cost-efficient cultivation systems e.g. reduce Optimization of energy usage.

2.2.3 Valorization of Algae Biomass. To propose new methods for processing harvested seaweed, taking into account the subsequent value chain (e.g. through biorefinery). To develop green chemistry approaches: Circular economy models and low-waste valorization chains.

2.2.5 Economic, Policy, and Social Research. To conduct market uptake/business models analysis for new algae-based products. To perform Life cycle assessments (LCA) to specify environmental impact categories relevant to marine cultivation: eutrophication potential, marine ecotoxicity, habitat modification index, and carbon sequestration vs. emission balance, and techno-economic assessments.

► Thematic Portfolio Member Project

SEAGROW

Seaweed Ecosystem Aquaculture for GROWth and Sustainability

Keywords:

Regenerative ocean farming, seaweeds, aquaculture, IMTA, blue economy

Lead organisation:

Óir na Farraige, Ireland

Project duration:

1/10/2025-30/9/2028

Funding source:

CINEA, EMFAF

Sea-basins:

Atlantic Ocean, Black Sea

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<https://www.seagoinggreen.org/seagrow-home>



[SeaGrow](#)



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PROJECT SUMMARY

SEAGROW is an EU project that aims to demonstrate the technical and commercial feasibility of regenerative ocean farming (ROF) while enhancing marine biodiversity and ecosystem health in Europe. Over 30 months, it will install an innovative seaweed farm in Irish waters and run an Integrated Multi-Trophic Aquaculture (IMTA) trial with scallops. The project focuses on the cultivation of macro-algae in marine environments with a strong emphasis on carbon sequestration, nutrient removal, biodiversity enhancement and the generation of marine-protein biomass. Funded through the EMFAF 2025 Flagship call, SEAGROW will design, deploy and operate a regenerative seaweed farm and an IMTA test site in Irish waters to generate scalable biomass, enhance biodiversity and create a developer led model for nature positive ocean farming.

Partner organisations: Óir na Farraige – Ireland, AIR Centre – Portugal, Sea Going Green – The Netherlands, Via Pontica Foundation – Bulgaria, Trinity College Dublin – Ireland, AquaBioTech – Malta, Clea Seas Aqua – Ireland.

BIOGRAPHY

Marine and Environmental Scientist with 20 years' experience in marine pollution, sustainable food production and the blue economy. She holds a PhD in Marine Sciences (2012) and two master's degrees, in Coastal and Marine Systems (2007) and in Ecology (2008), from the University of Barcelona. She is a Senior Researcher and Head of Biodiversity and Blue Economy at the AIR Centre, where she leads projects and initiatives in marine and environmental sciences.

She has conducted research and worked at leading European institutes and universities, collaborating with international, multidisciplinary teams and promoting international cooperation. From 2021 to 2024, she led the Work Package on International Cooperation at the H2020 ASTRAL project (All Atlantic Ocean: Sustainable, Profitable and Resilient Aquaculture), overseeing the development of the 'Atlantic Aquaculture Network'. She currently acts as an Atlantic Ocean Contact Node for the Sustainable Blue Economy Partnership (SBEP).

ROLE IN THE PROJECT

In SEAGROW, the AIR Centre plays an active role in the work packages related to Environmental Benefits & Biodiversity, Market Development, and Communication & Dissemination. The AIR Centre contributes to specific tasks that integrate aquaculture and biodiversity monitoring tools, develop frameworks for assessing ecosystem impacts, and design decision-support and eco-labelling systems.

Furthermore, the AIR Centre leads a task on Lessons Learned, which aims to develop recommendations to optimise regenerative aquaculture practices.

MOTIVATION TO JOIN THE THEMATIC PORTFOLIO

Sustainable aquaculture is one of the AIR Centre's areas of interest within the 'Biodiversity and Blue Economy' program. The AIR Centre supports technology transfer to fishers and blue food farmers, as well as promoting capacity-building activities in this sector. There is a particular focus on quadruple-helix collaboration involving industry, government, research institutes and communities. The AIR Centre is also committed to maintaining an active exchange of blue food knowledge amongst its members and providing training in aquaculture production methods to promote sustainable practices such as low-trophic aquaculture and integrated multi-trophic aquaculture.

The aim to join the Thematic Portfolio through the SEAGROW project is to advance sustainable, low-impact, and circular aquaculture practices across the Atlantic. Building on its experience at the H2020 ASTRAL project, the AIR Centre brings proven expertise in multi-stakeholder collaboration, knowledge transfer, and capacity building for blue food systems.

► Thematic Portfolio Member Project

BLUE BIO BOOST

Boosting seaweed farming through better utilization of genetic resources

Keywords:

Aquaculture, biodiversity, breeding, cultivation, genetic resources, macroalgae, sea lettuce, seaweed, strains, sugar kelp

Lead organisation:

Norwegian University of Life Sciences (NMBU)

Funding source:

SBEP Call 2

Project duration:

31/5/2024-30/5/2027

Sea-basins:

North Sea, Atlantic Ocean



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<https://bluebioboost.eu/>



[The Blue Bio Boost Project](#)



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PROJECT SUMMARY

Blue Bio Boost (www.bluebioboost.eu) aims for sustainable economic development of the macroalgae industry by improving the efficiency of propagation and selection of suitable genotypes, by better exploiting genetic variation, while at the same time maintaining local genetic diversity and minimizing the potential for genetic pollution of natural populations, and by actively involving stakeholders in creating a plan for future macroalgae breeding in Europe. We focus on sugar kelp (*Saccharina latissima*) and sea lettuce (*Ulva fenestrata*). These algae have two life stages; the sporophytes, which are macroscopic in both species, and gametophytes, which are microscopic in the kelps and macroscopic in sea lettuce.

In sea lettuce, there is a certain proportion of giant individuals appearing spontaneously. We are investigating whether these are polyploids or not, assessing their overall performance, and testing if they have different biochemical properties or not. To be able to recognize polyploids we have developed a flow cytometry-based protocol for sea lettuce and for sugar kelp. Up to now ploidy estimation in sea lettuce and sugar kelp was only possible through difficult and time-consuming chromosome counts. The first results suggest variation in ploidy level among individuals, but these results need further analysis and repetition. Ploidy estimation by flow cytometry can also be used to distinguish the morphologically similar haploid and diploid life stages of sea lettuce, and to investigate if and how higher ploidy levels can be utilized in development of high-yielding and/or non-reproductive (sterile) algae that do not hybridize with natural populations.

Regarding sugar kelp, we are performing a Proof of Concept (PoC) breeding experiment in three different countries. Firstly, we established gametophyte biobanks in all three countries as a stable germplasm resource for breeding. Secondly, we are testing if we can identify specific pairs of gametophytes to create hybrid lines with superior performance based on heterosis, and we will investigate dominance or additive genetic effects. The future application would be to cultivate a mixture of selected pair crosses, each giving superior high-yielding offspring, and together having allele frequency profiles that largely resemble that of the original natural population (the Mix-to-Match approach). Genotyping all sporophyte and gametophyte materials using whole genome sequencing is currently ongoing. We will also test if screening for superior crosses could be performed in tanks. We will assess the relative importance of heterosis and additive genetic effects on biomass yield, and we will perform simulation studies to infer optimal mating designs for development of mixtures of high-yielding crosses.

Slow growth of gametophytes is a bottleneck in kelp breeding; this has in fact delayed our PoC experiment by one year (the first generation of crosses are currently evaluated in sea); thus, we are exploring options to increase kelp gametophyte growth rates by altering light and nutrient regimes. We will also investigate the feasibility of producing doubled haploid sugar kelp through parthenogenesis and explore the mechanism driving spontaneous triploid sporophytes for potential utilization in the production of sterile kelp. A protocol for producing parthenosporophytes in female (only) cultures was successfully performed.

Finally, we interact with the stakeholders and aim to draft a white paper on a strategy for future European macroalgal breeding.

BIOGRAPHY

I am a plant biologist working with both agricultural crops and cultivated macroalgae. My focus is on breeding of improved material for cultivation and use. I am the coordinator of the SBEP project Blue Bio Boost (Boosting European seaweed farming through better utilisation of local genetic resources for more reliable algal biomass production).

MOTIVATION TO JOIN THE THEMATIC PORTFOLIO

It is highly important to interact and collaborate with other researchers working on similar or other aspects of macroalgae production and utilization.



► Thematic Portfolio Member Project

CIRCALGAE

CIRCular valorization of industrial ALGAE waste streams into high-value products to foster future sustainable blue biorefineries in Europe

Keywords:

Algae, circular economy, blue biorefinery, industrial side-streams valorization, bioactive ingredients, food, feed, cosmetics

Lead organisation:

Chalmers University of Technology,
Sweden

Project duration:

1/10/2022-30/9/2026

Funding source:

Horizon Europe – HORIZON-
CL6-2021-CIRCBIO-01-09

Sea-basins:

North Sea, Atlantic Ocean,
Mediterranean Sea



AMPARO JIMENEZ QUERO
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Areas of expertise: Biomass valorisation, algae biorefineries, sustainable extraction technologies, biobased materials, circular bioeconomy, scale-up processing, active packaging, environmental sustainability

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<https://www.circalgae.eu>



[CIRCALGAE](#)

PROJECT SUMMARY

CIRCALGAE is a Horizon Europe project focused on the circular valorization of macroalgae and microalgae side streams into high-value biobased products for food, feed, cosmetics, and material applications. The project brings together a multidisciplinary consortium across Europe to develop sustainable blue biorefinery strategies that maximize biomass utilization while minimizing waste generation and environmental impact.

The project integrates green extraction and fractionation technologies, ingredient development, biomass characterization, process scale-up, sustainability assessment, and market-oriented validation to support the transition toward a circular and climate-neutral blue economy. CIRCALGAE also aims to strengthen regional algae value chains across different European sea-basins and promote industrial symbiosis between algae producers, technology developers, and end-users.

BIOGRAPHY

Dr. Amparo Jiménez Quero holds a PhD in Biotechnology from the University of Strasbourg, France, where she specialized in the valorization of cereal by-products for the development of novel bio-based plastics through microbial conversion. She is currently Assistant Professor in Industrial Biotechnology at Chalmers University of Technology and Principal Investigator at the Wallenberg Wood Science Center. Her research focuses on the sustainable valorization of biomass and side streams into high-value chemicals, materials, and food additives, with a particular emphasis on circular bioeconomy approaches and the development of bio-based packaging solutions.

Dr. Jiménez Quero has extensive experience in biomass characterization, extraction technologies, and the conversion of renewable resources into functional materials. Her research interests include lignocellulosic biomass, algae, fungal biomass, and agricultural side streams, as well as the design of active and biodegradable packaging systems. She is actively involved in several European research projects, including CIRCALGAE, PHAntastic, ECHOS, and SISTERS, contributing to the development of sustainable materials and circular value chains.

Dr. Jiménez Quero is currently coordinating the Horizon Europe project CIRCALGAE, leading a consortium of 22 partners across Europe. Within the project, she oversees activities related to the circular valorization of algae biomass, including the development and scale-up of innovative extraction and biorefinery processes, stakeholder engagement, and the production of sustainable bio-based ingredients for food, feed and cosmetics. She is also committed to education and mentoring, teaching sustainable methodologies for bio-based material production and supporting the next generation of researchers in the field of industrial biotechnology.

MOTIVATION TO JOIN THE THEMATIC PORTFOLIO

CIRCALGAE strongly aligns with the objectives of the Sustainable Blue Economy Partnership (SBEP) thematic portfolio by contributing to the sustainable and circular use of marine biomass resources. The project supports SBEP priorities including blue biotechnology, circular bioeconomy, sustainable innovation, and resource-efficient marine value chains. Participation in the SBEP thematic portfolio would facilitate collaboration and knowledge exchange with complementary European initiatives, strengthen dissemination and exploitation of project outcomes, and support the scalability and replication of algae-based circular solutions across multiple European sea-basins. CIRCALGAE can contribute valuable expertise in sustainable algae processing, green extraction technologies, biomass valorization, and development of high-value biobased products to the broader SBEP community.

► Thematic Portfolio Member Project

MARMADE

MARine bioMass valorizAtion for fooD and fEed innovation

Keywords:

Bio-based products, environmental friendly factory processes, marine biomass, fodd and fish feed ingredients, circular economy, biorefinery approach, cascading extraction processes

Lead organisation:

UNICAM, Italy

Project duration:

9/1/2025-31/8/2028

Funding source:

CBE-JU

Sea-basins:

Mediterranean Sea, North Sea

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<https://marmade-project.eu/>



[MARMADE](#)

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PROJECT SUMMARY

The MARMADE project aims to transform marine “waste” into valuable resources for food and animal feed, helping to build a more sustainable, circular, and zero-waste economy. Today, large amounts of marine biomass—such as shrimp shells, crab residues, and seaweed—are discarded or underused, despite being rich in nutrients and bioactive compounds. At the same time, food systems are under increasing pressure due to population growth, climate change, and limited natural resources. MARMADE addresses both challenges by turning these overlooked materials into high-value, sustainable ingredients.

The project focuses on two main types of marine biomass: residues from seafood processing (such as shrimp shells and invasive blue crabs) and different types of seaweed, including species that currently create environmental problems. By using these resources, MARMADE not only reduces waste but also helps restore ecosystems—for example, by removing invasive species from coastal areas.

At the core of MARMADE is a zero-waste biorefinery approach, meaning that every fraction of the biomass is fully valorised. Instead of generating waste, all components are recovered and converted into valuable products, ensuring that nothing is lost along the process. To achieve this, MARMADE develops innovative and environmentally friendly technologies inspired by the concept of a “biorefinery.” This allows the conversion of biomass into multiple useful ingredients, such as proteins, healthy fats, vitamins, fibers, and natural compounds that can improve the nutritional quality, taste, and functionality of food and feed products.

The project will test these new ingredients in real applications, such as dairy alternatives, bakery products, meat and fish substitutes, and aquaculture feed. The goal is to create products that are not only sustainable but also appealing to consumers in terms of taste, texture, and quality. At the same time, MARMADE carefully evaluates safety, nutritional value, and regulatory aspects to ensure that all new ingredients can be safely used and accepted in the market.

A key strength of MARMADE is its holistic approach to sustainability. The project assesses environmental, economic, and social impacts throughout the entire process—from raw material sourcing to final products. It aims to significantly reduce greenhouse gas emissions, energy use, and waste, while also lowering production costs compared to conventional ingredients.

In addition, MARMADE actively involves stakeholders, including industry, researchers, and consumers, to ensure that the developed solutions meet real market needs and societal expectations. This collaborative approach increases the chances that the results will be adopted and scaled up beyond the project.

Overall, MARMADE contributes to a more sustainable food system by turning marine by-products into valuable resources, eliminating waste through a zero-waste approach, reducing environmental impacts, and supporting innovation in the bio-based economy.

BIOGRAPHY

Germana Borsetta is a researcher, project manager, and adjunct professor at the University of Camerino (UNICAM), specializing in sustainable agri-food systems, circular economy, and blue economy. She is currently involved in European research projects, including the Horizon CBE-JU project MARMADE, where she acts as Work Package Leader for WP8 (project coordination and management) and contributes as an expert in blue economy. She also worked on the PRIMA project Agri-fiSh, focused on the valorisation of agricultural and marine by-products for sustainable aquaculture and food innovation.

She holds a PhD in Chemical and Pharmaceutical Sciences and Biotechnology from UNICAM, a Master's degree in Environmental Policies and Sustainable Development from the Institut Catholique de Paris, and a postgraduate Master's degree in Management of Coastal and Aquatic Resources. She has collaborated with FAO, the United Nations, the European Parliament, and CNR on projects related to climate-smart agriculture, fisheries, and sustainable food systems.

MOTIVATION TO JOIN THE THEMATIC PORTFOLIO

MARMADE is motivated to join the Sustainable Blue Economy Partnership because it addresses a simple but urgent challenge: how to use marine resources more responsibly while reducing waste and protecting ecosystems. Today, large amounts of marine biomass—such as seafood residues and seaweed—are discarded, even though they contain valuable nutrients. MARMADE turns these materials into useful ingredients for food and animal feed, following a circular and zero-waste approach.

By joining the SBEP Thematic Portfolio, MARMADE aims to collaborate with other projects working towards healthier oceans and more sustainable blue value chains. This collaboration will strengthen knowledge sharing, support innovation, and help accelerate the uptake and scalability of solutions across Europe. Working together is essential to move from research to real-world impact.

MARMADE also contributes to raising awareness among citizens about the importance of reducing waste and making better use of marine resources. By demonstrating practical solutions, the project supports more sustainable consumption patterns and strengthens trust in bio-based innovations.

Participation in SBEP will enhance the visibility, replication potential, and policy relevance of MARMADE results, contributing to EU priorities such as the Green Deal, the Bioeconomy Strategy, and the transition to a sustainable and resilient Blue Economy.

► Thematic Portfolio Member Project

SEALGAEPOWER

Sustainable development of microalgae-based ingredients using waste streams from aquaculture and seafood processing industry

Keywords:

Marine microalgae, aquaculture, seafood processing industry, wastewater remediation, microalgae cultivation, cascade biorefinery, biomass valorization, microalgae-based products, bioactive properties of microalgae, value-chain circularity

Lead organisation:

University of Gothenburg, Sweden

Project duration:

31/8/2025-30/8/2028

Funding source:

SBEP Call 2

Sea-basins:

North Sea, Mediterranean Sea



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<https://www.sealgaepower.eu/>



[SEAlgaePower](#)

PROJECT SUMMARY

The overall objective of the SEAlgaePower is to develop microalgae-based technologies to clean side stream water from the aquaculture and seafood processing industry while simultaneously producing biomass for novel ingredients in a sustainable way.

The specific aims are to:

- (i) select suitable microalgae species/strains from the North and the Mediterranean Sea in a lab-scale cultivation system based on the ability to grow in different water types;
- (ii) develop pilot-scale algae cultivation protocols and side stream water cleaning;
- (iii) develop biorefinery protocols for protein, lipid and carbohydrate recovery from the microalgal biomass;
- (iv) develop microalgae-based prototypes and ingredients;
- (v) assess environmental and socio-economic aspects associated with the project solutions on wastewater cleaning, microalgae cultivation and biomass valorisation, and
- (vi) maximise the project impact, visibility, and legacy. SEAlgaePower consortium consists of thirteen partners from seven countries with well-defined roles according to their expertise.

UGOT, NORCE and UNIPA will provide microalgae strains. UGOT will employ a two-stage cultivation in laboratory conditions and select those strains which in combination with side stream water from salmon aquaculture and process water from the seafood industry (Klädesholmen SeaFood) give the highest biomass yield and the cleanest water. NORCE and DTI will scale-up the cultivation in side stream water from salmon aquaculture (RagnSells and NFH, respectively) and optimize it for selected microalgae to achieve maximal nutrient removal via conversion to proteins, omega-3 fatty acids, carbohydrates, and carotenoids. The biomass will be sequentially fractionated by UAveiro together with Chalmers and DTI.

Depending on the composition of different fractions, prototypes and ingredients will be developed for fibers in Medtech (RISE), fish feed (DTI), food (Chalmers), and fertiliser (NIBIO). The bioactivities of the extracts will be tested by UNIPA and UAveiro for use as ingredients in MedTech, nutra- and pharmaceuticals. Environmental and socio-economic assessment of the project, dissemination of the results to stakeholders and public will be performed by SITES and ISP. SEAlgaePower will contribute to establish an EU climate-neutral, sustainable, resilient blue economy, leveraging microalgae-based technologies which can turn a current cost of seafood producing and processing companies into an income source through valorization of their side stream waters.

BIOGRAPHY

Cornelia Spetea Wiklund (CSW) is a professor of plant cell physiology and head of the PHOBIO group at University of Gothenburg (<https://www.gu.se/en/research/phobio>).

CSW has expertise in photosynthesis, molecular biology, physiology of plants and algae for the last 30 years. In the last eight years, CSW has also gained expertise in cultivation of microalgae from the Swedish west coast in production of renewable biomass in sea and aquaculture side stream water. CSW coordinates the SBEP project SEAlgaePower. CSW's team screens marine microalgae from the North and Mediterranean Seas when cultivated at laboratory scale in various types of waters from aquaculture and seafood processing industry. CSW is the supervisor of a new researcher funded by this project.

MOTIVATION TO JOIN THE THEMATIC PORTFOLIO

Cornelia Spetea Wiklund is the coordinator of SEAlgaePower project with the overall objective to develop microalgae-based technologies to clean side stream water from the aquaculture and seafood processing industry while simultaneously producing biomass for novel ingredients in a sustainable way. Her team expertise falls into Topic 2 subthematics Sustainable, circular and low-impact Algae Cultivation Systems.

Motivation is that we will select suitable microalgae species/strains from the North and the Mediterranean Sea in a lab-scale cultivation system based on the ability to grow in different nutrient-rich side stream waters from aquaculture and processing industry.



► Thematic Portfolio Member Project

SEAREFINERY

Improved Valorization of Marine Sources and Processing Waste for Resource Efficient Blue Food/ Feed and Environmentally Sustainable Materials Development

Keywords:

Algae, marine derived biopolymers, meat analogues, cheese analogues, functional bread, collagen based nanofiber, smart and active packaging, biochar based biosensor, aquaculture waste, single cell protein

Lead organisation:

KTH Royal Institute of Technology

Funding source:

SBEP Call 2

Project duration:

15/4/2024-15/4/2027

Sea-basins:

North Sea, Mediterranean Sea, Atlantic Ocean, Baltic Sea, North Sea

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<https://www.kth.se/searefinery/searefinery-1.1347380>



<https://www.linkedin.com/company/searefinery/>

PROJECT SUMMARY

The SEAREFINERY project aims to develop a new bio-based platform to produce sustainable blue food, blue feed, and marine-based food packaging materials. The project focuses on marine resources and waste streams from five European seas. By bringing together researchers, industry partners, and stakeholders from different fields, SEAREFINERY creates a collaborative platform to design practical and environmentally friendly solutions that consider local resources as well as economic and social factors across Europe. One of the main goals of the project is to extract valuable compounds from secondary marine sources such as invasive species, low-trophic organisms, and by-products from fish processing and aquaculture. These compounds will then be used to develop new products. Examples include blue food alternatives to meat and cheese, functional bread enriched with marine nutrients, and smart or active food packaging materials that can help extend food shelf life and reduce food waste. Another important part of SEAREFINERY is the valorization of fish and aquaculture waste. Instead of being discarded, these waste streams can be converted into useful products such as sustainable feed ingredients. The project will use biological processes such as bacterial fermentation and microalgae cultivation to transform these wastes into nutrient-rich feed for aquaculture and agriculture. SEAREFINERY will also carefully evaluate the environmental and social impacts of the developed products and processes. This includes assessing environmental benefits, analyzing market potential, and studying consumer acceptance of the new products. The results will then be combined using a decision-making framework to identify the most sustainable and practical solutions.

By the end of the project, SEAREFINERY aims to show how secondary marine resources and wastes can be turned into valuable products while supporting healthier marine ecosystems. The project will contribute to a more sustainable blue economy in Europe by creating new opportunities for innovation, investment, and environmentally friendly products that benefit both society and the environment.



BIOGRAPHY

I am currently working as a researcher at KTH Royal Institute of Technology in the Department of Industrial Biotechnology. My research focuses on resource recovery from waste streams and contaminated environments, with the goal of transforming underutilized or polluted materials into valuable resources. In particular, I specialize in the recovery of critical elements such as metals and phosphorus from marine sediments.

In the SEAREFINERY project, I serve as the Project Manager, where I coordinate project activities, facilitate collaboration among partners, and ensure that research objectives and timelines are effectively achieved. Within this project, I expand my research by exploring innovative approaches to transform secondary marine resources into value-added products. This work contributes to the development of sustainable biorefinery concepts that support circular economy strategies while addressing environmental challenges in marine ecosystems.

MOTIVATION TO JOIN THE THEMATIC PORTFOLIO

The SEAREFINERY team is motivated to join Thematic Portfolio to strengthen collaborations and knowledge exchange within the field of sustainable biomass valorization. Our project team have expertise including algae biomass valorization, use of value-added products for food and feed applications, bioprocess development and downstream processing. Within the Thematic Portfolio, we believe that our participation will foster valuable synergies with other partners working across the marine bioeconomy. We aim to contribute our knowledge in microbial and algal bioprocesses to support the development of integrated and circular biorefinery approaches. Our team is particularly interested in exploring algal cultivation, extraction of bioactive compounds, and the valorization of process side-streams. Through this collaboration, we aim to enhance process efficiency, promote resource recovery, and accelerate the transition toward a low-carbon and sustainable blue economy.

► Thematic Portfolio Member Project

SEAFOODTURE

Integral valorisation of seaweed biomass for the development of sustainable, high nutritional quality food products

Keywords:

Seaweed, valorisation, food, ingredients, packaging, proteins, nutrition, fibres, biomass, sustainability

Lead organisation:

CSIC, Spain

Project duration:

1/5/2024-30/4/2027

Funding source:

SBEP Call 1

Sea-basins:

Mediterranean Sea, Baltic Sea, North Sea, Atlantic Ocean



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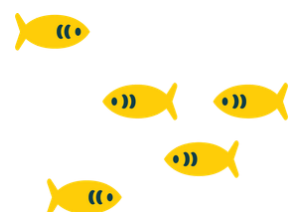
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[SeaFoodture](#)



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PROJECT SUMMARY

SEAFOODTURE addresses one of the key challenges for the future of global food systems: how to produce nutritious foods while reducing pressure on natural resources. As the global population grows, the demand for food proteins continues to increase, yet conventional animal-based production has a high environmental footprint. Seaweeds offer a promising alternative because they can grow in the ocean without the need for freshwater, arable land or fertilisers.

However, their potential for food applications in Europe remains largely unexploited. In this context, the goal of SEAFOODTURE is to unlock the potential of seaweeds produced in the EU by developing sustainable cultivation approaches, efficient processes to concentrate proteins and/or make them more digestible, nutritious food products and innovative packaging materials. The project brings together experts from different fields to explore the entire value chain, from seaweed cultivation to product development and environmental assessment.

So far, the project has generated important knowledge on sustainable seaweed cultivation and identified promising species with high potential as sources of nutritious proteins. We are developing environmentally friendly processing methods to extract protein-rich ingredients and improve their digestibility and nutritional quality. These ingredients are being used to design new food prototypes that combine good nutritional value with consumer acceptance. The project also promotes a circular approach to biomass use. Residues from seaweed processing and industrial seaweed by-products are being explored as raw materials for biodegradable packaging materials, helping reduce waste and supporting more sustainable food systems.

SEAFOODTURE aims to strengthen the European seaweed sector, create new economic opportunities in coastal regions, and contribute to healthier and more sustainable diets. In doing so, the project supports broader European goals related to climate action, circular economy and resilient food systems.



BIOGRAPHY

Marta Martínez is the coordinator of the SEAFOODTURE project. She is a Tenured Scientist at the Institute of Food Science Research, in Madrid (Spain). Her research focuses on the multi-scale structural characterization of food biomass sources and its correlation with techno-functional properties, aiming to develop strategies for a more efficient use of natural resources in food systems. In particular, she has extensive experience on the valorisation of marine biomass to develop functional food ingredients and bio-based packaging materials. She has authored more than 100 scientific publications, led multiple national and international projects, and worked at leading international institutions, such as the University of Illinois, Chalmers University and the Australian Nuclear Science and Technology Organisation.

Vera Cebrián Lloret is a postdoctoral researcher at the Institute of Food Science Research in Madrid, Spain. Her research focuses on the valorisation of seaweed to develop sustainable and nutritionally rich food products. As leader of WP5 in the SEAFOODTURE project, she coordinates activities related to the assessment of the nutritional quality of seaweed and protein-rich extracts, evaluating their bioavailability and allergenicity, while also supporting other work packages focused on the structural characterisation of seaweed.

MOTIVATION TO JOIN THE THEMATIC PORTFOLIO

SEAFOODTURE is strongly aligned with the objectives of the Thematic Portfolio “Innovations for boosting sustainability in marine algae cultivations and circularity in the blue bioeconomy.” Our motivation to join this initiative is to contribute to the development of sustainable seaweed value chains that maximise the use of marine biomass while minimising environmental impact.

Participation in the Thematic Portfolio provides an excellent opportunity to exchange knowledge, methodologies and best practices with other projects addressing complementary aspects of algae cultivation and processing. Through this collaboration, SEAFOODTURE aims to contribute to the development of integrated and scalable solutions that strengthen the European seaweed sector, support coastal economies and accelerate the transition towards a sustainable blue bioeconomy.

► Thematic Portfolio Member Project

ALGAEPROBANOS

Accelerating algae product developments in Baltic and North Sea

Keywords:

Algae products, cultivation, processing

Lead organisation:

SUBMARINER Network for Blue Growth

Project duration:

1/4/2023-31/3/2027

Funding source:

Mission Ocean and Waters

Sea-basins:

North Sea, Baltic Sea,
Caribbean (as source of
Sargassum)



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[SUBMARINER Network for Blue
Growth EEIG](#)



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PROJECT SUMMARY

Algae represent one of the most promising sustainable resources available to Europe. They can be turned into food, animal feed, cosmetics, biomaterials and biostimulants, cultivated with minimal land or freshwater, and can even help restore marine ecosystems. But while the science is compelling, turning algae into real products on shelves and in industrial supply chains can be challenging. Producers face fragmented markets, unclear regulations, limited access to investment, and uncertain consumer demand.

AlgaeProBANOS is a four-year Horizon Europe project (2023–2027), funded under the EU’s Mission “Restore our Ocean and Waters by 2030”, working to close the gap between algae innovation and the market. It brings together 26 partners – research institutes, SMEs, and expert partners – and focuses on the Baltic and North Sea region, building on its distinctive algae species, expertise and supply chains.

The project works across a number connected strands including:

Pilots and product development. AlgaeProBANOS runs coordinated pilots that take promising algae products from the laboratory through to pre-market demonstration (moving from TRL 4–5 up to TRL 7–8). The pilots span macro- and microalgae applications, from food and feed to cosmetics, nutraceuticals, textile agents and biostimulants.

The Algae Accelerator. Through open calls, the project provides mentoring and business support to algae start-ups and SMEs across Europe. Two cohorts consisting of 20 algae sector start-ups and SMEs have already been supported, receiving hands-on help to refine their products, business models and routes to market.

Digital tools for the sector. A suite of practical digital tools – now available via the AlgaeProBANOS website – helps producers and decision-makers navigate the algae value chain, including an AI-powered algae knowledge base, an “Algae Economist” tool to calculate financial implications of different biorefinery decisions, and an algae products and species dashboard with a wealth of information regarding algae in Europe.

Co-creation with end users. AlgaeProBANOS works directly with the people who will buy, use or regulate algae products, to understand preferences, test prototypes, and make sure innovations answer real needs.

By the end of the project, AlgaeProBANOS aims to deliver a pipeline of market-ready products, a set of open-access tools and evidence for industry, investors and policymakers, and a stronger, better-connected algae community across the Baltic and North Sea.

BIOGRAPHY

Ferdinand Bulmer is the coordinator of AlgaeProBANOS, a 26-partner Horizon Europe project accelerating the development and market uptake of macro- and microalgae products in the Baltic and North Sea region. Since the project's launch in 2023, he has led the consortium's overall delivery, working closely with partners as they steer their innovations towards viable routes to market.

Ferdinand is also Team Lead for Aquatic Value Chains at the SUBMARINER Network for Blue Growth, where he manages a team of eleven delivering EU-funded projects across algae, fisheries and fish aquaculture.

He holds an MA in Environment, Politics and Globalisation from King's College London and a BA in Geography from the University of Sheffield, and previously managed European education and innovation projects at EIT RawMaterials.

MOTIVATION TO JOIN THE THEMATIC PORTFOLIO

AlgaeProBANOS joins Thematic Portfolio 2 at a timely moment. With the project past its midpoint, we are moving from generating results to sharing them – and the portfolio offers a ready-made platform to bring our work on pilots, digital tools, sustainability assessment, business support and policy to a peer group working on related challenges.

Equally, we have a lot to learn from the other portfolio members. The priorities flagged at the kick-off – policy alignment, market research, product development and legislation – map closely to areas where AlgaeProBANOS partners are actively generating insights, and where joint outputs could amplify what any single project could do alone.

For us, the Thematic Portfolio is also about continuity. AlgaeProBANOS ends in 2027, and we hope the portfolio will help keep the conversations, collaborations and networks we have built alive well beyond the project's final meeting.

► Thematic Portfolio Member Project

ALLIANCE

European microalgae alliance (alliance): innovative, safe, and sustainable multi product biorefineries for a blue biobased economy

Keywords:

Multiproduct (solvent-free) biorefinery, increased sustainability, novel products, consumer acceptance

Lead organisation:

Wageningen University, Netherlands

Project duration:

9/1/2025-31/7/2029

Funding source:

CBE-JU

Sea-basins:

North Sea, Baltic Sea,
Mediterranean Sea, Atlantic
Ocean



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[Microalgae ALLIANCE website](#)



[Microalgae ALLIANCE](#)



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PROJECT SUMMARY

ALLIANCE aims to broaden the uptake of microalgae-based products in the EU market, improving the cost-effectiveness, circularity, and overall sustainability of production, processing and product development steps.

Our ambition is to demonstrate the effective establishment of algae-based mid-value ingredients using multi-product biorefineries for food, cellular agriculture, aquafeed, and agriculture sectors. Previous sustainability and cost analyses clearly pointed at our R&I targets: recirculating nutrients and water, ALLIANCE aims to expand access to microalgae-based products in the EU market, making it cheaper and more sustainable. Our ambition is to demonstrate multiproduct biorefineries for food, aquafeed, and agriculture ingredients.

Our previous sustainability and cost analyses clearly pointed at our R&I targets: recirculating nutrients and water, efficient and automated control of production, reducing nutrient consumption, prioritizing renewable energy and off-the-grid operation, and solvent-free biorefinery processes.

We will focus on vertical integration of upstream and downstream processes, developing and demonstrating technological solutions on the targets above for four different existing algae pipelines, which will expand from 4 into 15 lines of fractions/products (and near-zero waste). ALLIANCE will use solvent-free extraction and purification technologies that are scalable and cost-competitive, as well as wet-biomass, bypassing the dewatering process. The ingredients will feed an integrated exploitation strategic plan to identify different business cases and their timelines and markets.

We will work in a multidisciplinary and multi-actor approach, with a broad group of stakeholders joining us in reaching European consumers and supporting the penetration and acceptance of microalgal biobased products. Finally, we will collaborate with policy-making communities to propose concrete solutions for addressing gaps in legislation and regulatory frameworks.

BIOGRAPHY

I am the Research Manager of our team (Microalgal biotechnology/BPE/Wageningen University), a role I grew into from a background in project and innovation management. I am a trained bioprocess engineer (PhD, Wageningen University, 2016) and I work alongside our Team Leader and members to design, implement, and follow up on the group's projects. Currently, I lead work packages in 6 projects, coordinate 3 EU consortia, and manage the finances of the team and our pilot facility AlgaePARC. My research interests sit at the intersection of biotechnology, life cycle and techno-economic assessment (LCA/TEA), and circular and bio-based processes. What I bring to the role is a habit of moving between fields and integrating what I find there: fundamental biology, process engineering, and applied innovation. Our team is led by Prof. Maria Barbosa and includes 3 professors, 4 technicians, and more than 20 PhD students.

Find more about our team at: <https://www.wur.nl/en/chair-groups/bioprocess-engineering/research/microbial-biotechnology> and AlgaePARC, our pilot and R&D facility in Wageningen (www.algaeparc.com).

MOTIVATION TO JOIN THE THEMATIC PORTFOLIO

Our team's expertise (Microalgal Biotechnology, Wageningen University) is a direct match for the thematic portfolio. We currently coordinate 4 EU projects and partner in 3 more, and coordinate 2 national projects with partner roles in another 4. Among these, ALLIANCE – a CBE JU project bringing together 19 partners across 8 industry members (including SMEs) and 11 research and innovation institutes – is coordinated by me, with Prof. Maria Barbosa as scientific coordinator. This gives us a working view of how to run multidisciplinary, international consortia at scale.

The group has more than 25 years of experience in microalgal biotechnology and operates AlgaePARC, our pilot facility and research programme bridging academic knowledge and industrial application. The combination – a research group with deep fundamentals and a pilot facility with industry-facing capacity – lets us move comfortably between fundamental and applied research, between scientific evidence and policy, and between expert and public communication. Innovation management is part of the same continuum, not a separate activity.



Sustainable Blue
Economy Partnership