REGIONS & CITIES | European Week Brussels 7-10 October 2019

# No need to get the BLUES – Blue Biotechnology in European Regions

Analysing **Smart Specialisation Strategies** and **project data**

A Study commissioned by the JRC Seville

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European Commission

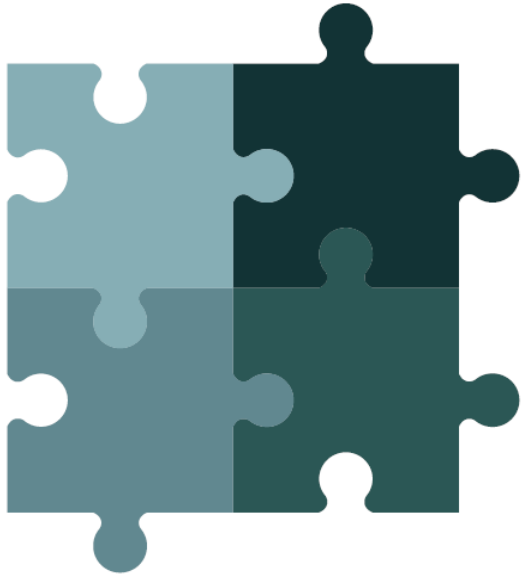
spatial foresight

European Committee of the Regions

# Blue biotechnology in European regions

**Microalgae**
Harvesting and Processing

**Bioactive compounds**
Biorefinery of Marine Biomass



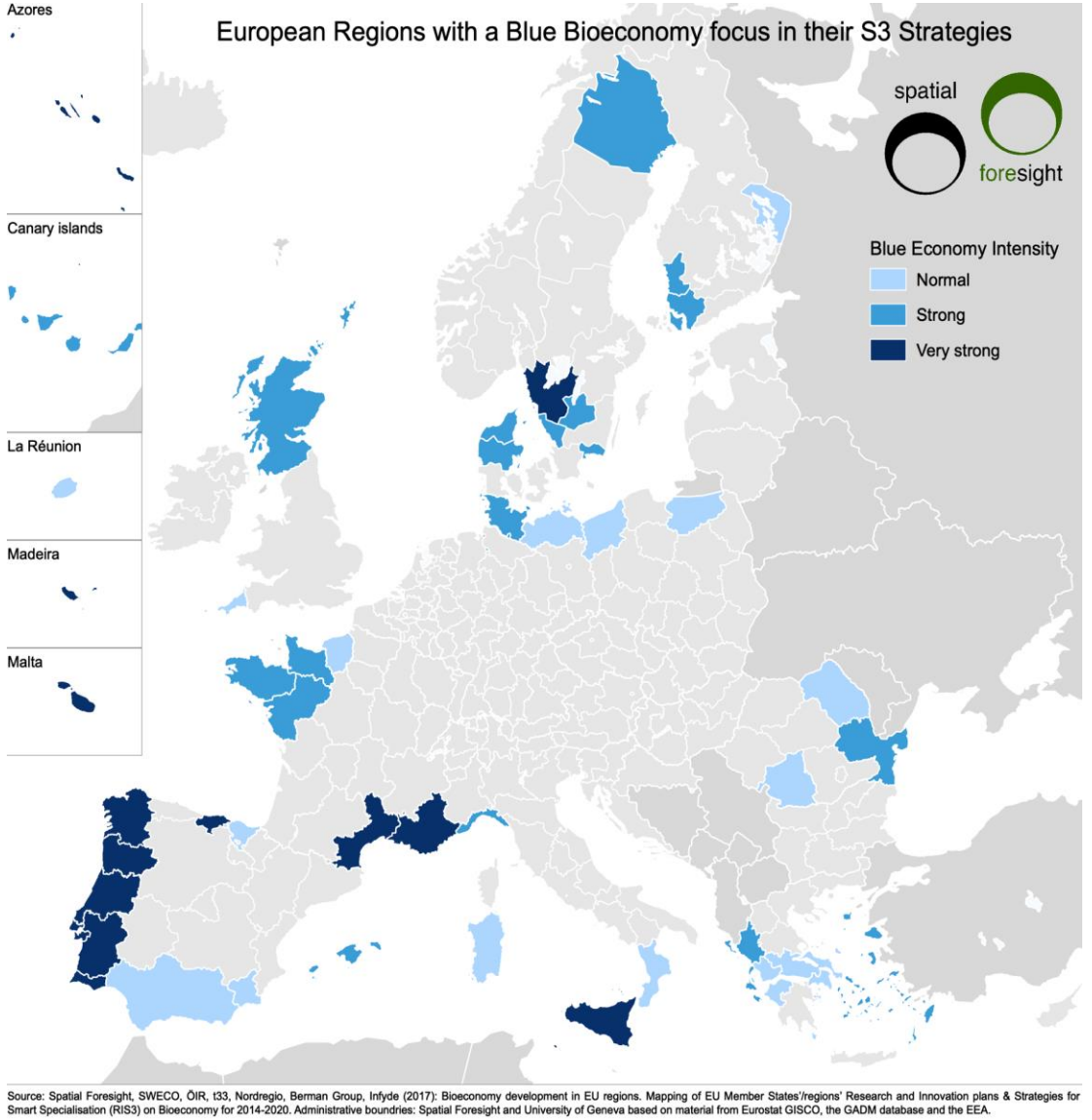
**Aquaculture**
Innovation for sustainability and efficiency

**Algae, seaweed, aquatic plants**
Aquaculture, Harvesting and Processing

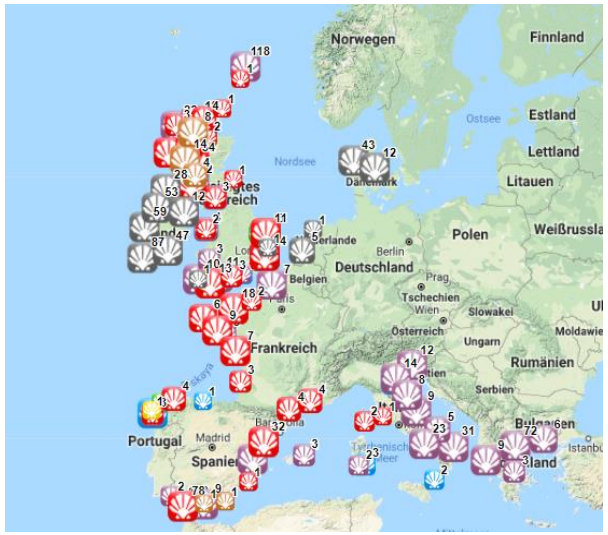
**12 EU countries*** and **53 EU regions** with **Blue Biotechnology priorities*** in their **S3 strategies**.

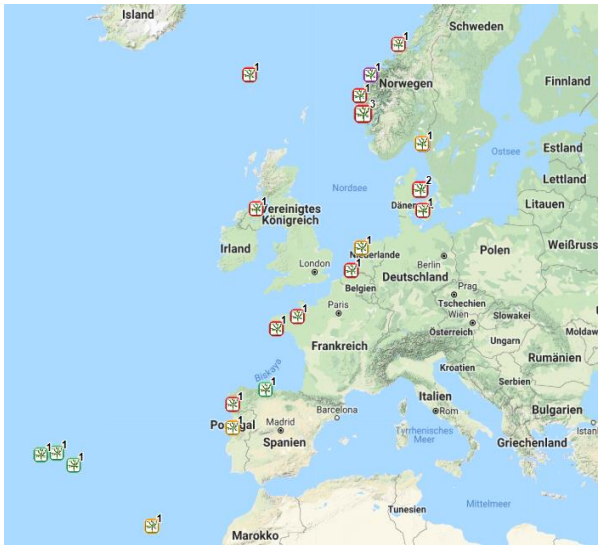
* BG, CY, DE, DK, EE, EL, IRL, IT, MT, PT, RO, SE

**mentioned in different forms: Marine-based primary production, Marine resources, Fisheries and Aquaculture, Marine-based biomass, marine sciences



# Blue biotechnology in European regions



1. Finfish and shellfish aquaculture concentrated on the coast

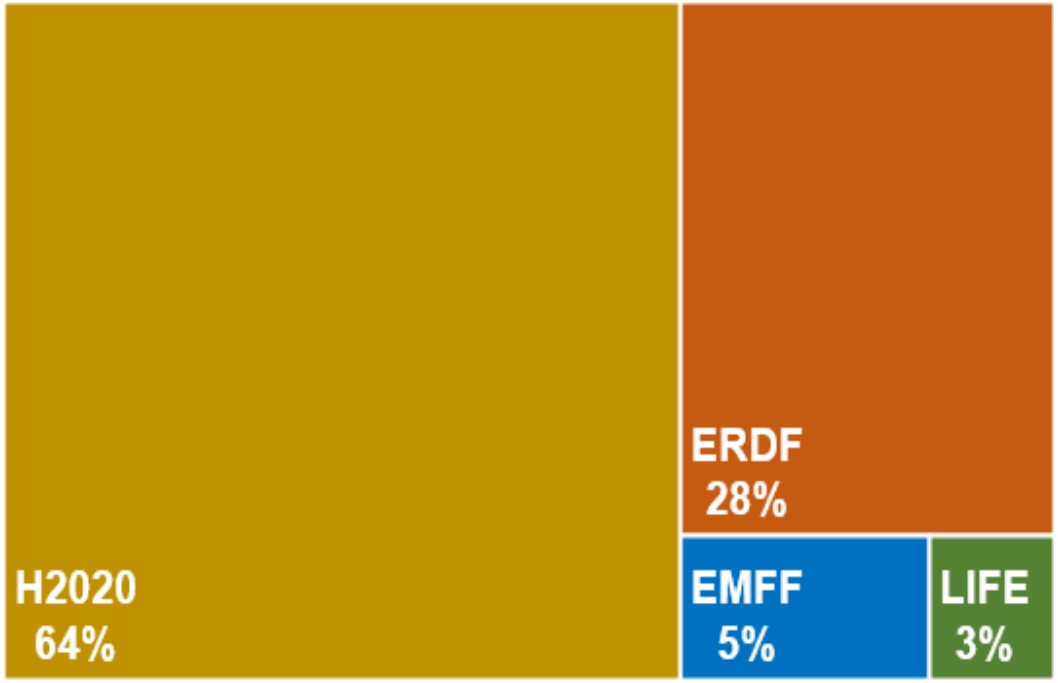

3. Microalgae plants not only coastal.

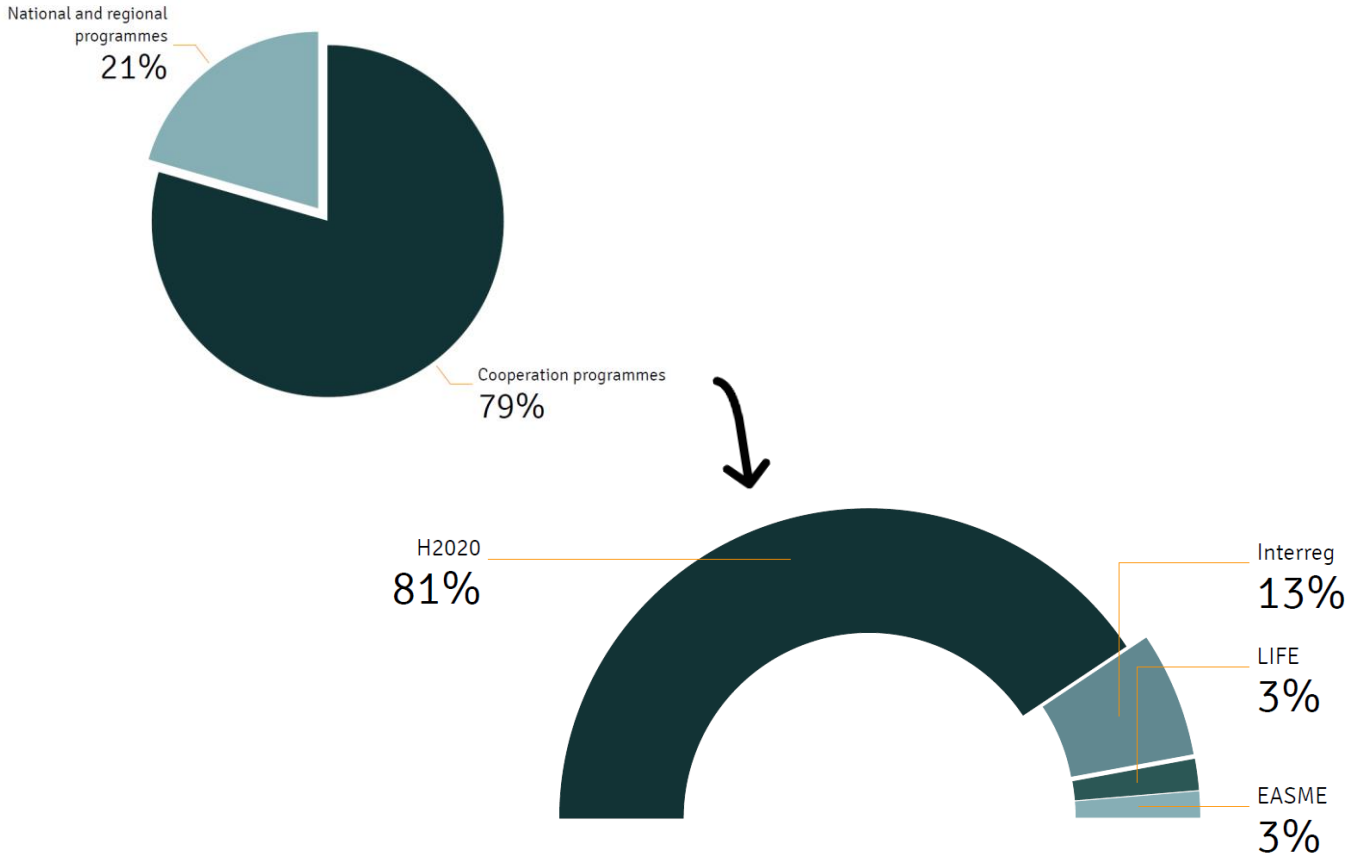
2. Algae and seaweed aquaculture and harvesting few regions, mainly Atlantic

https://www.emodnet-humanactivities.eu/view-data.php (August 2019)

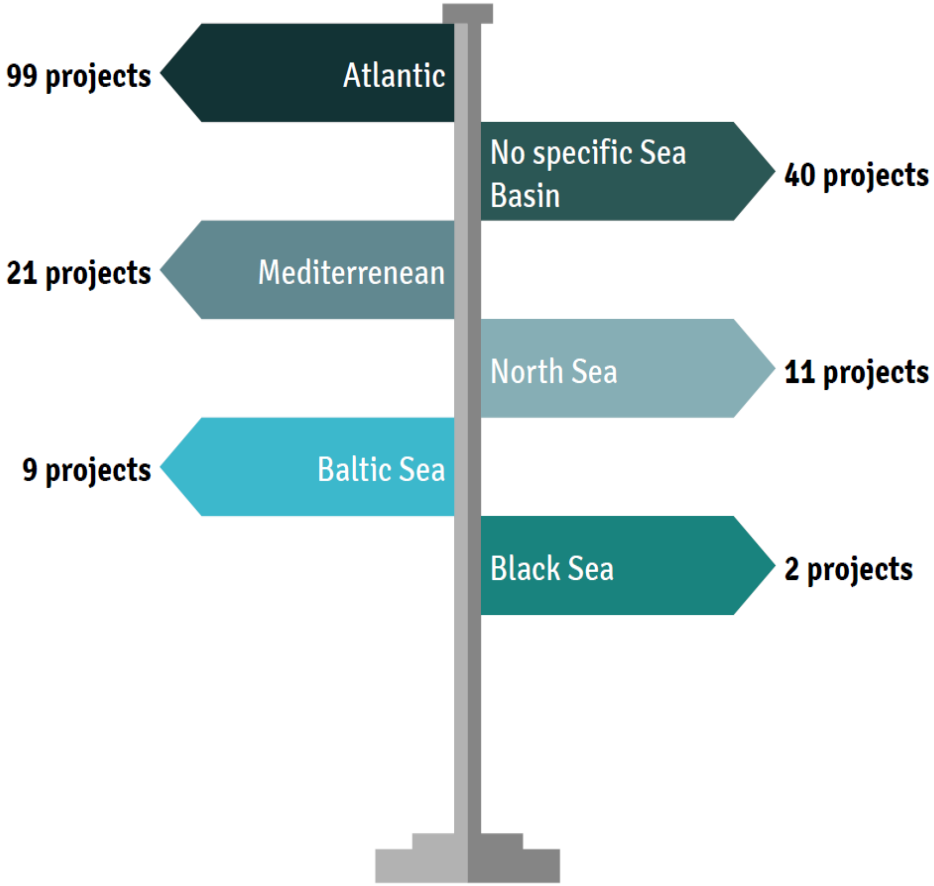
# Investments in Blue Biotechnology

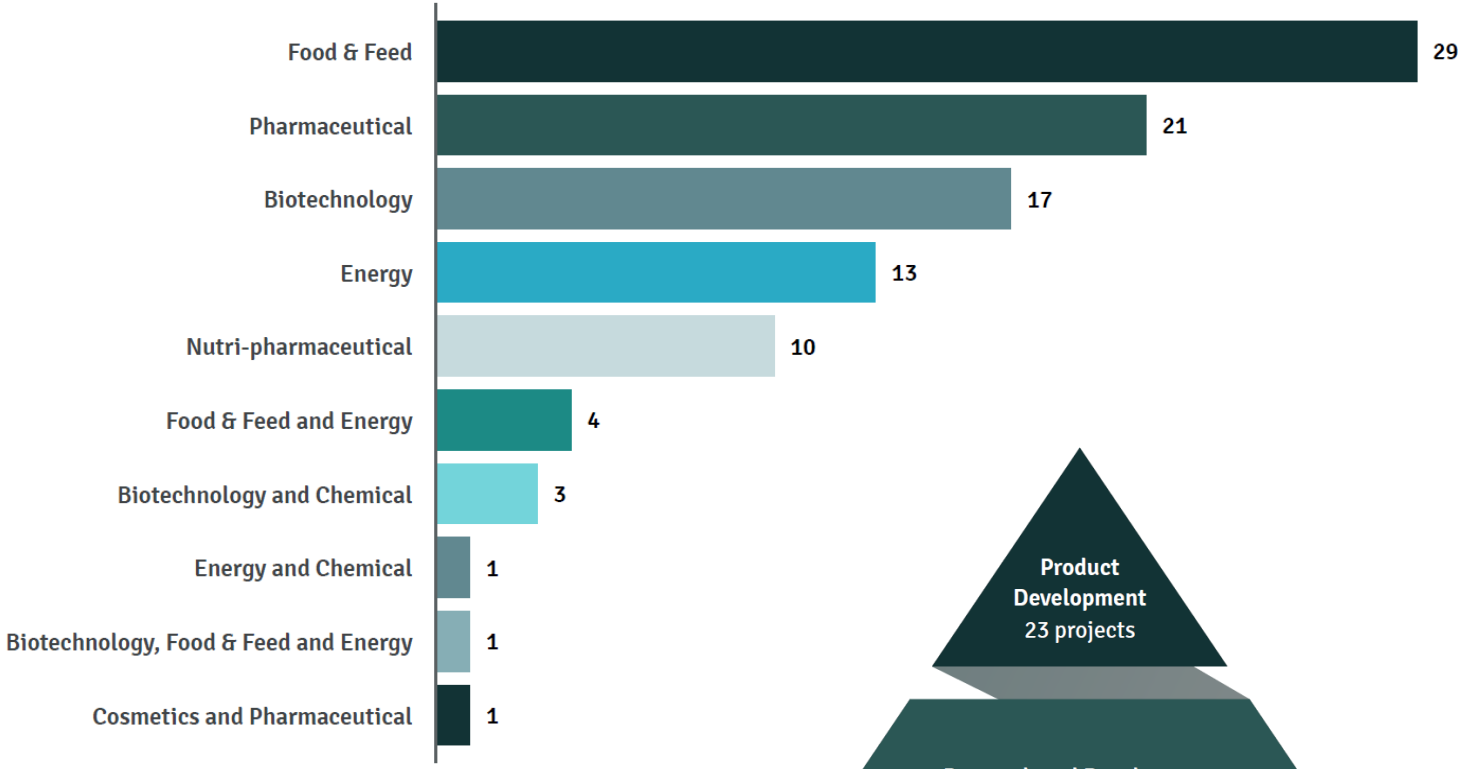
- A comprehensive screening of EU supported interventions in the **current 2014-2020 funding period** shows that **EUR 238.6 million of EU funds** have been invested in **182 projects and initiatives related to Blue Biotechnology** with a **total budget of EUR 336 million.** (some detailed information on ERDF programmes in Member States is missing, to the actual amount can be considered even higher)

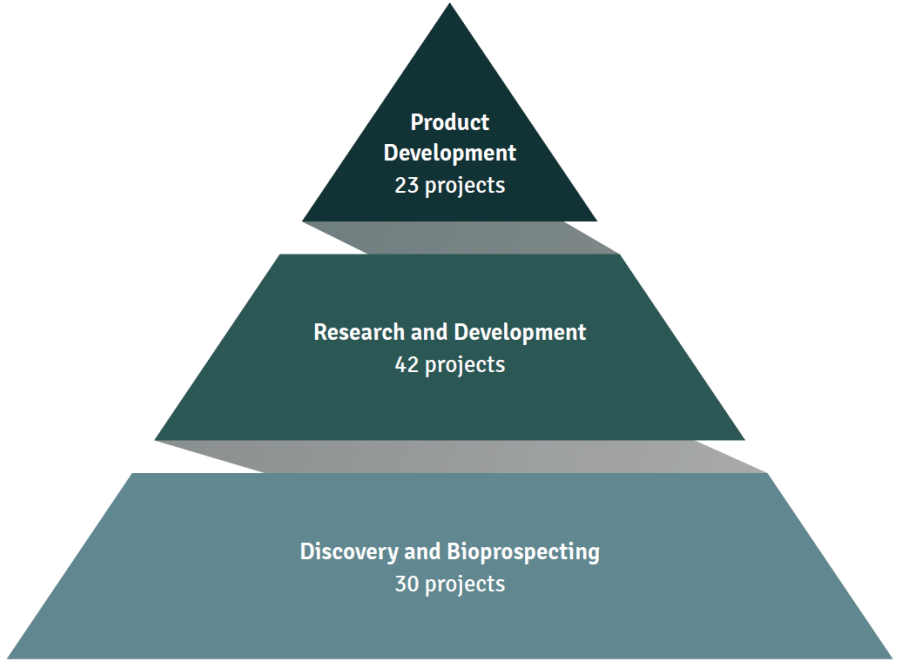


# Investments in Blue Biotechnology



# Different regional approaches

## 5 regional types of approaches to Blue Biotechnology:

**Type 1: Regions with a research driven bioeconomy profile** – for example, regions in Germany, Finland, The Netherlands or Flanders.

**Type 2: Regions with a natural resources and heritage driven bioeconomy profile** – many regions in the Mediterranean or at the Black Sea, and various islands.

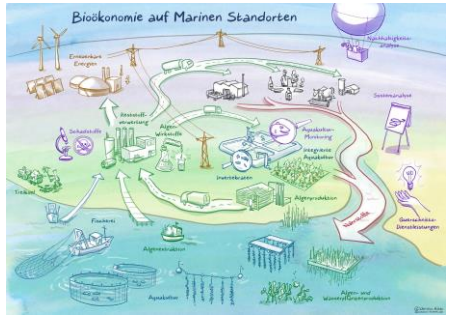
**Type 3: Regions with a primary value chain bioeconomy profile** – Regions like Galicia, Crete or many Danish or Portuguese regions have a strong fishery and aquaculture sector. Research and innovation are still is mostly applied to existing activities and focusing on the agricultural and food/feed use of marine resources.

**Type 4: Regions with an industrial biotech profile** – Regions like Central Germany, Nord-Pas-de-Calais, or Lombardy have a huge interest in microalgae and bioactive compounds for industrial applications, among them the ones coming from marine biomass.

**Type 5: Regions with an integrated and advanced Blue Bioeconomy profile** – Regions like Scotland or Brittany have holistic approaches to Bioeconomy, connecting biomass and traditional fishing with research and active business development on new applications of biobased products for industry, food, energy, etc.

# Case Studies and project examples

The **Blue Bioeconomy Roadmap for Portugal** was presented in 2019. It is the result of a joint work of CIIMAR, BLUEBIO ALLIANCE and Fundação Oceano Azul (Vasconcelos et al. 2019).




EBB
an EMBRC project

IBioIC

Scotland: **Aquaculture Science & Research Strategy**. Scottish Government Ministerial Group for Sustainable Aquaculture (MGSA). (2014).

**European Marine Biological Resource Centre Biobank (EBB)**

blueMed

Ireland: Harnessing Our Ocean Wealth - An Integrated Marine Plan for Ireland (2012) and National Marine Research & Innovation Strategy 2017–2021 (2017).

EnAlgae
collaborate innovate communicate


**ICT-Biochain**

ICT-Biochain is a consortium of eight partners from across Europe working to increase the efficiency of biomass supply chains using ICT.

Blue Platform (2018 - 2021)

Advancing Blue Bioeconomy Capacities in the Baltic Sea Region.

Interreg Baltic Sea Region
EUROPEAN REGIONAL DEVELOPMENT FUND
EUROPEAN UNION

**Blue Platform**

Spain: Strategic Plan for Innovation and Technological Development Fisheries and Aquaculture 2014 - 2020. PTEPA. Update 2017.

# Case Studies and project examples

## Scotland

- Marine Scotland
- Aquaculture Science & Research Strategy
- Biorefinery Roadmap for Scotland
- Industrial Biotechnology Innovation Centre (IBioIC)
- Scottish Aquaculture Innovation Centre
- Scottish Association of Marine Science (SAMS)
- Marine Alliance for Science and Technology for Scotland (MASTS)
- European Marine Science Park, specific marine business incubator

## Schleswig-Holstein

- GEOMAR Centre for Marine Biotechnology (GEOMAR-Biotech) and in the Fraunhofer Institute for Marine Biotechnology
- Masterplan Marine Biotechnology Schleswig-Holstein
- Regional Strategy for Sustainable Aquaculture
- National Competence Network on Aquaculture
- Marine Biotechnology is a key technology in the S3 strategy
- Part of the SUBMARINER network of the Baltic macro-region (EUSBSR) – projects Blue ALLIANCE, Smart Blue Regions, Baltic Blue Growth etc.

## Slovenia

- National Institute of Biology, Piran (Marine Biology Station)
- EUSAIR strategy goals on blue growth
- Slovenia S4 Strategy – circular economy, new biomaterials
- Partner in **BlueMed** Project
- Leading the COST Action **OCEAN4Biotech** (CA18238 - European transdisciplinary networking platform for marine biotechnology) with researchers from 28 countries 2019-2023
- Participate in H2020 Project **GoJelly** on y developing a TRL 5-6 prototype microplastics filter made of jellyfish mucus

# Conclusions

- Need for a type-specific support: advanced regions need other policies than regions with a strong natural heritage focus
- Policy support not only for one Blue Biotech subsector (e.g. biofuel), as other products are even more market-ready
- Not only focus on one application for algae, as Blue Biotechnology as a key enabling technology for many markets.
- Innovation often comes from the combination of research, science and markets needs

| Group | Indicator |
|---|---|
| **Natural Resources** | • Amount and value of macro algae production (annual)<br>• Amount and value of microalgae production (annual)<br>• Amount and value of aquaculture production (except freshwater) |
| **Policy commitment** | • No. of dedicated research or development strategies tackling Blue Biotechnology (aquaculture, algae, aquatic resources, Marine resources)<br>• No. of dedicated Blue/Marine Biotechnology or aquaculture research and innovation funding programmes in the last 10 years/per year |
| **Science and Technology** | • No. of research units (in Universities, Technology Centres, Innovation Centres, Science Centres etc.) dealing with Blue Biotechnology (aquatic or marine biomass)<br>• No. of researchers FTE (in Universities, Technology Centres, Innovation Centres, Science Centres etc.) dealing with Blue Biotechnology (aquatic or marine biomass)<br>• No. of dedicated research Blue Biotechnology projects per year (working with marine/aquatic biomass) (source would be Funding programmes or asking in research centres or universities about their projects). |
| **Business activity** | • No. of clusters / innovation networks in Blue Biotechnology (aquaculture, algae, aquatic resources, Marine resources) – this might include Biotechnology, Agri-food or New Material Cluster/networks if dealing specifically with marine and aquatic resources.<br>• No. of start-ups in accelerators/incubators dedicated to Blue Biotechnology<br>• Private investments in Biotechnology (sub-category: working with marine/aquatic biomass)<br>• No. of companies working with Blue Biotechnology (Biotechnology: sub-category: working with marine/aquatic biomass) |
| **Social impact** | • Employment in macro algae production (annual)<br>• Employment in microalgae production (annual)<br>• Employment in aquaculture production (except freshwater)<br>• Employment in Blue Biotechnology companies |

# Methodology

- **Desk Research: Definition and description of the Blue Biotechnology**
  - Review of strategic documents and reports
  - Review of databases on Smart Specialization Strategies and the dataset of the Report “Bioeconomy in European Regions”, Spatial Foresight et al. 2017
  - Collection of project data in databases on ERDF Cohesion Data, EMFF, EASME, LIFE, KEEP (Interreg), H2020 projects
- **Elaboration of a database on Blue Biotechnology projects in Europe**
- **Case Studies with Interviews (not finalised)** Scotland, Baltic Sea and Schleswig-Holstein and Slovenia/BlueMed
- **Review of existing Indicators and proposal of new indicators**
- **August – October 2019**
- **Final Study due: November 2019**

# Time for questions

THANK YOU

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