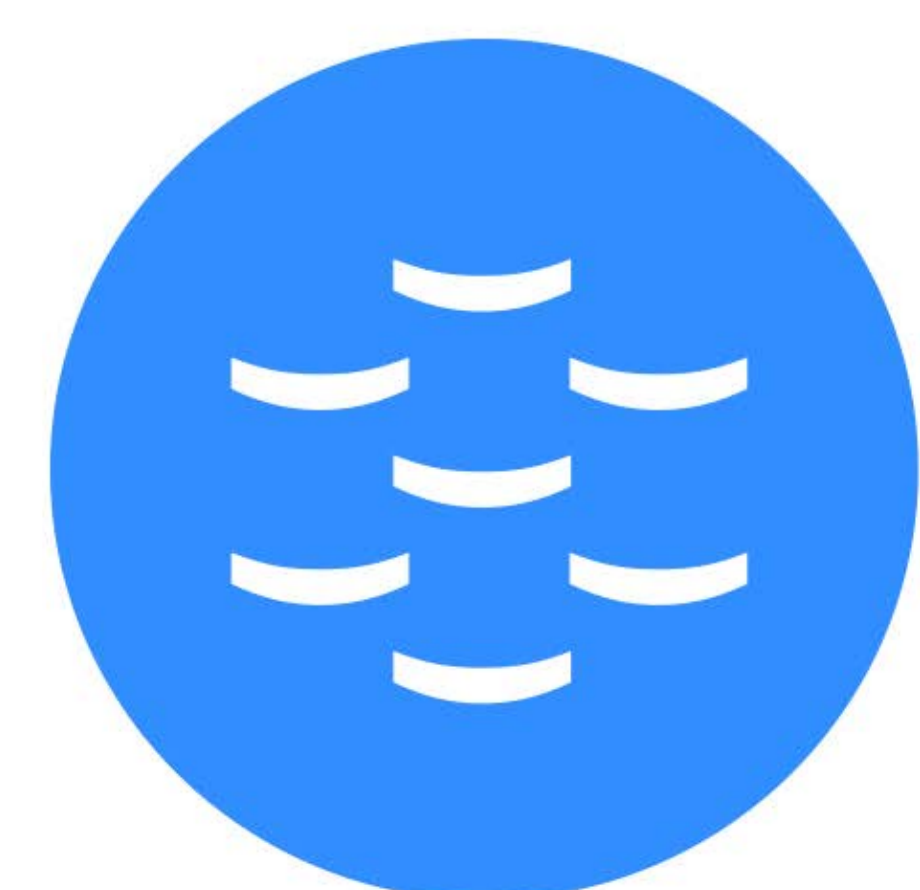
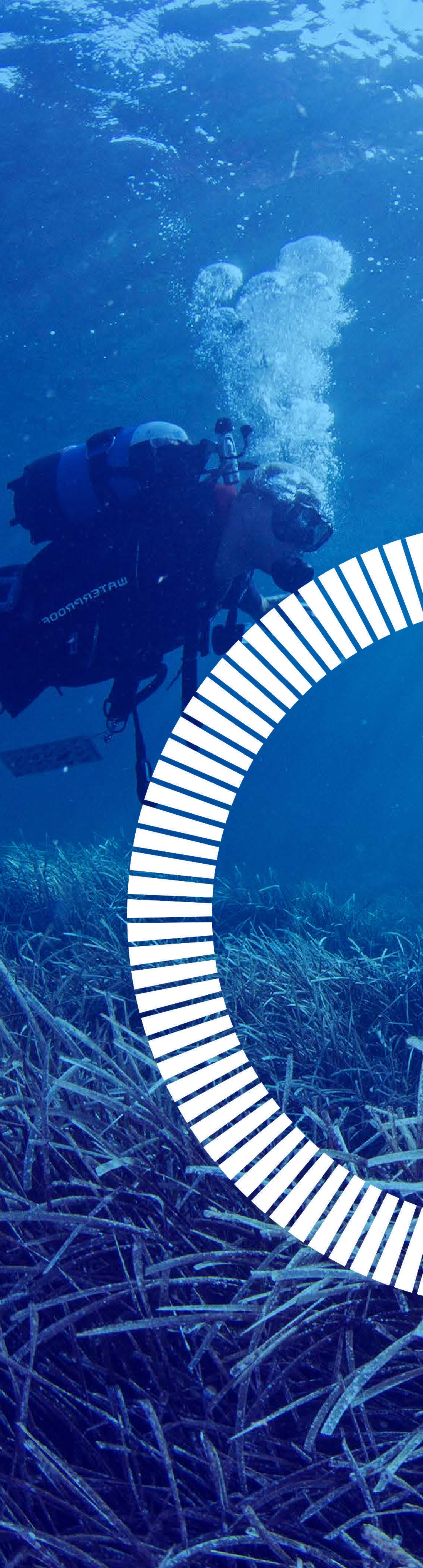


Industrial Engagement Strategy 2024



EMBRC
EUROPEAN
MARINE
BIOLOGICAL
RESOURCE
CENTRE

THE ECONOMICS



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A message from our Industrial Liaison Officer

Covering two-thirds of our planet, the ocean is a cornerstone of the global economy and humanity’s well-being, contributing to global food, employment and economic growth.

In the past 20 years ocean economic activities (e.g. fishing, aquaculture, transport, energy, among others) have kept increasing more quickly than the rest of the economy (OECD Ocean Economy Monitor, April 2024). A clear example is aquaculture: one of the fastest growing food producing sectors in the world. As climate change advances, the ocean’s ability to regulate the Earth’s climate, enhances the need for conservation and to ensure sustainable use of the ocean’s biological resources while enhancing economic development.

For all these reasons, **the ocean is taking a central place in international discussions for designing and updating management policies.**

Policymakers are inviting the private sector and academia to join and share their needs and expertise. In particular, 2024 has been a year marked with international policy events, from the UN Ocean Decade Conference in Barcelona to the Oceans20 in Brazil.

In this global geopolitical context, EMBRC is launching its Industrial Engagement Strategy which supports emerging and established industries, such as marine aquaculture, marine biotechnology and marine observation.

EMBRC aims to support private sector researchers and Blue Economy professionals by providing unparalleled access to marine ecosystems and biodiversity in all European seas, from northern Norway to tropical Israel. As well as offering more than 500 scientific services, its EMO BON (European Marine Omics Biodiversity Observation Network) initiative, a sustainable marine biodiversity observatory which deepens our understanding of biodiversity health in the oceans. The data from EMO BON promotes the informed and sustainable management of marine resources by different industries: fisheries and aquaculture, offshore renewable energy, ports and shipping, among many others.

.....
Initiatives like this prove that EMBRC is a vital hub for knowledge transfer, and offer plenty of opportunities for partnerships.
.....

This includes the co-development of new technologies and prototype testing, advancing innovation and blue growth in Europe.

Mery Piña, PhD
Industrial Liaison Officer,
EMBRC, Headquarters

THE VISION

The vision of the EMBRC's Industrial Engagement Strategy is to strengthen the connection between academia and industry through a coordinated knowledge and technology transfer service that can be objectively measured to report the impact of its innovation.

To create value, EMBRC must foster interconnection and cooperation within its own community and promote exchanges between this consolidated community and private stakeholders. This functional partnership diminishes the risk for the private sector when engaging in the development of new technologies. It also allows the EMBRC community to become attentive to and adapt faster to their scientific needs.

Furthermore, the Industrial Engagement Strategy aims to raise awareness of the services, scientific resources and technological expertise available within the EMBRC country members (Nodes).



This will increase industry use of EMBRC services and resources, and will support **the creation of an open innovation ecosystem driven by the collaboration between industry and academia.**

Its objectives align with and support the EMBRC Strategy's (2023-2027) and aim to increasingly integrate the infrastructure's scientific resources with the global innovation ecosystem, leading to new services, new technologies, and economic growth.

THE OBJECTIVES

To improve EMBRC's contribution in the development of a sustainable Blue Economy, we have identified three strategic objectives:

Integrate EMBRC's scientific resources into the innovation ecosystem

Build-on EMBRC's human assets to promote regional innovation through a consolidated EU network of top-notch services and experts.

Increase the use of EMBRC's services and resources by industry

Promote EMBRC's visibility and positioning through the launch of a global scientific and technological communications campaign.

Measure and reporting innovation indicators

Gather relevant data and implement data-driven decision-making to report the infrastructure's actual impact and uncover its potential to support the ocean economy.

THE RATIONALE

EMBRC contributes to 5 industrial sectors of the ocean economy, as defined in the OECD's Ocean Economy report (2016) (see Table 1).

Marine R&D and education services are the corner stone of our network's contribution, with more than 80 research institutions in our portfolio.

EMBRC also contributes to marine business services which include marine consulting, technical services, inspection, and survey.

Emerging industries such as marine aquaculture and marine biotechnology, can be found in our catalogue of services and various user stories, EU collaborative projects and internal initiatives, such as Joint Development Activity calls and Working Groups.

High-tech marine products and services – which concern data management and informatics and underpin the development of emerging sectors such as marine renewable energy and marine environmental monitoring – are core to EMBRC'S EMO BON initiative.



ESTABLISHED INDUSTRIES

- Capture fisheries
- Seafood processing
- Shipping
- Ports
- Shipbuilding and repair
- Offshore oil and gas (shallow water)
- Marine manufacturing and construction
- Maritime and coastal tourism
- **Marine business services**
- **Marine R&D and education**
- Dredging

EMERGING INDUSTRIES

- **Marine aquaculture**
- Deep and ultra-deep-water oil and gas
- Offshore wind energy
- Ocean renewable energy
- Marine and seabed mining
- Maritime safety and surveillance
- **Marine biotechnology**
- **High-tech marine products and services**
- Others

The industries where EMBRC plays a role are highlighted in **blue**.

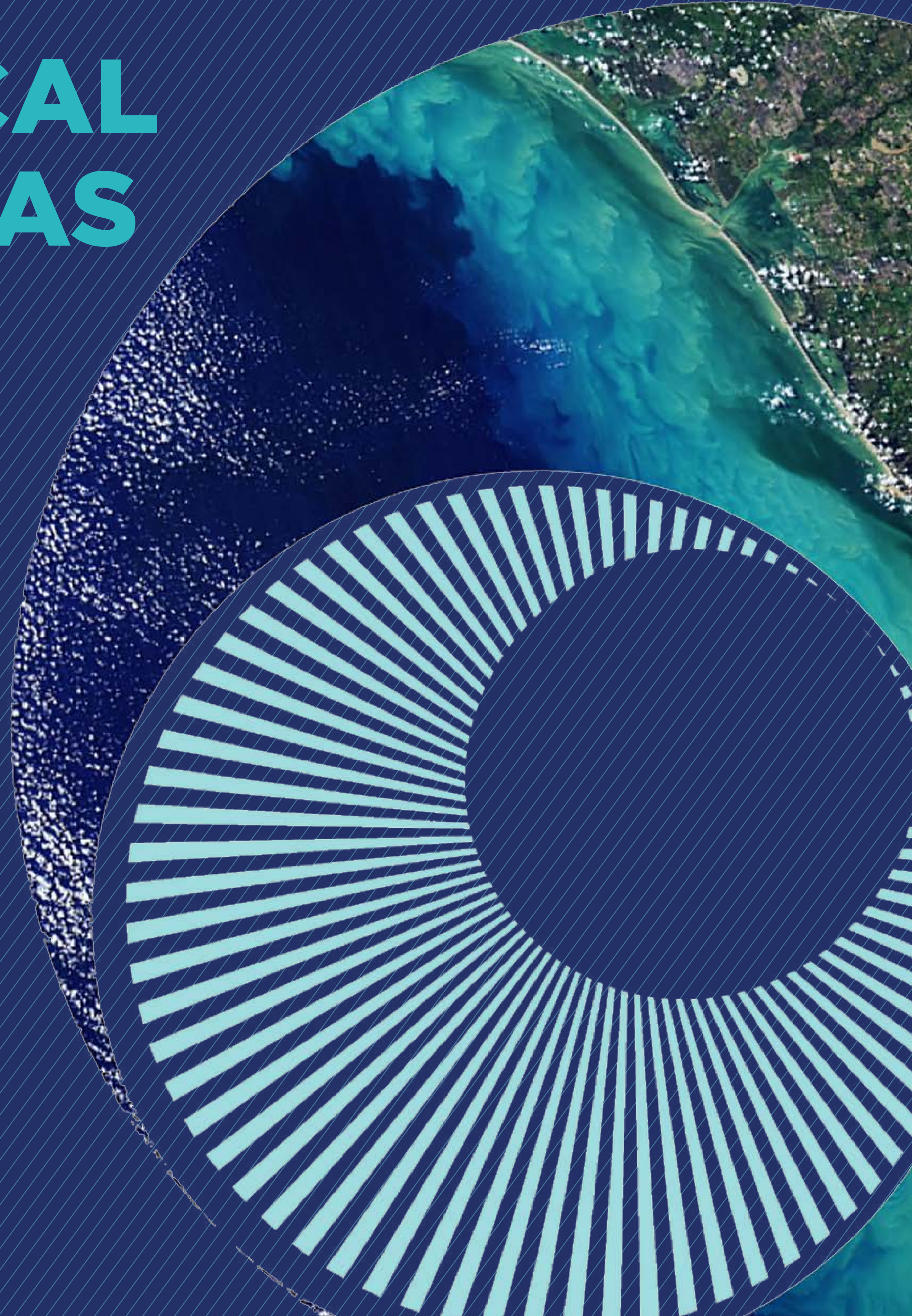
Table 1. Established and emerging ocean-based industries (OECD, 2016)

EMBRC'S TECHNOLOGICAL PRIORITY AREAS

The Industrial Engagement Strategy is focused on 3 Technological Priority Areas (TPAs):

3 areas where the Research Infrastructure will accelerate innovation and new technologies. These TPAs fall into the category of emerging ocean-based industries, according to the OECD's classification, align with Horizon Europe Pillars and contribute to the UNESCO's SDGs, as shown in Table 2.

The rationale behind the definition of these areas is based on preliminary results from data analysis of the last five years of requests received by EMBRC to access its scientific services.



EMBRC'S TPAS	OECD CLASSIFICATION	HORIZON EUROPE PILLARS	UNESCO'S SDGS
Aquaculture	Marine aquaculture	Bioeconomy	    
Marine Observation	High-tech marine products and services	Natural resources Energy and climate	   
Bioprospecting	Marine biotechnology	Health	 

Table 2. EMBRC's Technological Priority Areas (TPAs) with its matching categories of the ocean-based industries from the OECD, Horizon Europe Pillars and UNESCO's SDGs.

AQUACULTURE

The EU imports 70% of its seafood consumption and produces roughly 2% of global aquaculture production.

However, Europe is a world leader in R&D and development of equipment, governance methodologies, culture and husbandry practices. EMBRC's is a strategic partner of European aquaculture, helping the producers of fish, crustaceans, mollusks, macroalgae, and other organisms to improve their technologies. Some examples of the kind of studies our technology platforms support are feed trials, microbiome studies, up-scaling, quality and nutritional assessment studies, genetic studies applied to selective breeding, test of innovative disease-control approaches, and many more.

EMBRC contributes to the sustainability and circularity of the aquaculture industry by promoting the development of side-stream valorisation strategies and the transformation of by-products into commodities, such as enzymes, fish oil, fertilisers, and even products with medical applications.

BIOPROSPECTING

The discovery of new bioactive compounds, or natural products, commercialised as pharmaceuticals, nutraceuticals, cosmetics, food additives or animal feeds is closely related to EMBRC's core missions.

EMBRC brings together a catalogue of biological resources from marine origins and a portfolio of technological platforms to identify, isolate, and characterise new molecules. Researchers from the private sector are welcome to exploit our multidisciplinary expertise by performing genomic and chemical analysis, bioactive tests and taking advantage of access to our facilities for up-scaling to identify novel bioactive molecules.

MARINE OBSERVATION

New policies to mitigate climate change and biodiversity loss are forcing companies to report on their environmental impact and sustainability practices.

The EU Corporate Sustainability Reporting Directive (CSRD) and the Taskforce on Nature-related Financial Disclosures (TNFD) are examples of the new rules and guidance for disclosure which are relevant to more than 40 000 companies in Europe are concerned.

The expertise that EMBRC is building through EMO BON and the genomic data generated by this initiative can be applied to environmental monitoring and impact assessment of sectors such as fisheries, aquaculture, deep-sea mining, carbon sequestration, or offshore energy.

EMBRC & THE BLUE BIOECONOMY

EMBRC AIMS TO SUSTAINABLY DEVELOP THE BLUE BIOECONOMY BY ACCELERATING KNOWLEDGE TRANSFER, TECHNOLOGY AND INNOVATION IN 3 EMERGING INDUSTRY SECTORS.

The Blue Bioeconomy incorporates any economic activity associated with the use of renewable aquatic biological resources such as fish, algae, or micro-organisms to make novel goods and services.

EU MARINE LIVING RESOURCES SECTOR (2021)*

€22.0 billion+ in GVA**

543 000+ people employed
+1% compared to 2020

*As per 2021 data, the EU Blue Economy report, 2024
** GVA: Gross Value Added (measures the value of goods and services produced in a sector)

MARINE AQUACULTURE

consists of farming aquatic organisms (e.g fish, molluscs, crustaceans or algae) in the sea, and is one of the world's fastest growing food sectors.*

*Source: European Commission

MARKET SIZE

1.2 million t
of aquaculture products*

Only **38%** of seafood consumed in the EU relies on the national production**

*As per the EU Blue Economy, 2024
**As per the EU aquaculture: State of play, June 2024

EMBRC CONTRIBUTIONS

70+
EMBRC services available

150-250
access requests
for EMBRC services/year



MARINE BIOTECHNOLOGY

is the application of science and technology to living marine organisms or parts of them to make products in agriculture, medical, pharmaceutical and food and feed industries.*

*Source: European Commission

MARKET SIZE

€868 million in GVA*

3000+ people employed**

* As per 2021 data, the EU Blue Economy report, 2024
** As per 2023 data, the EU Blue Economy report, 2024

EMBRC CONTRIBUTIONS

150+ EMBRC services available

30-80 access requests,
for EMBRC services/year



MARINE OBSERVATION

supports emerging sectors such as marine renewable energy, environmental monitoring and resources management through advanced technologies and methods (data management platforms, advanced informatics and marine life sensing tools, marine robotics, and AI)*.

*Source: The Ocean Economy in 2030 (2016)

MARKET CHALLENGES

Offshore renewable energy increased by **18%****

34% of fish stocks are **overfished***

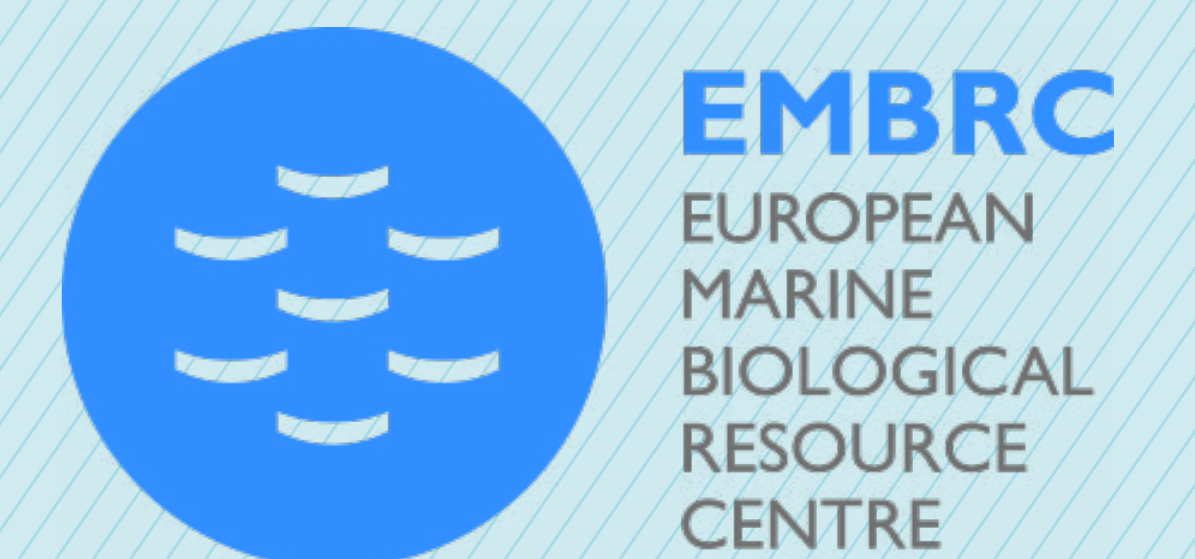
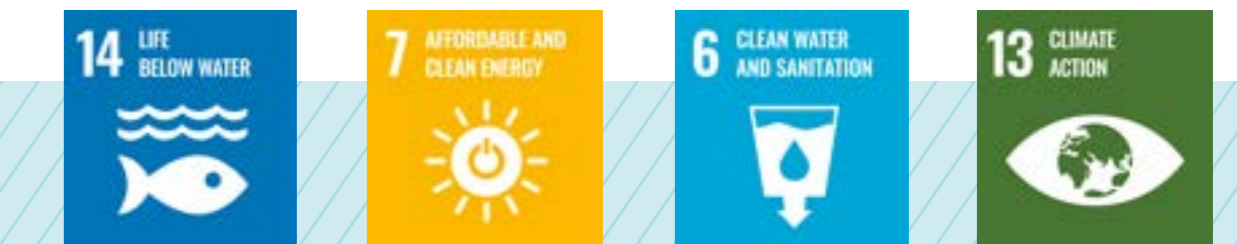
*IPBES
**From 2020 to 2021, Mordor Intelligence

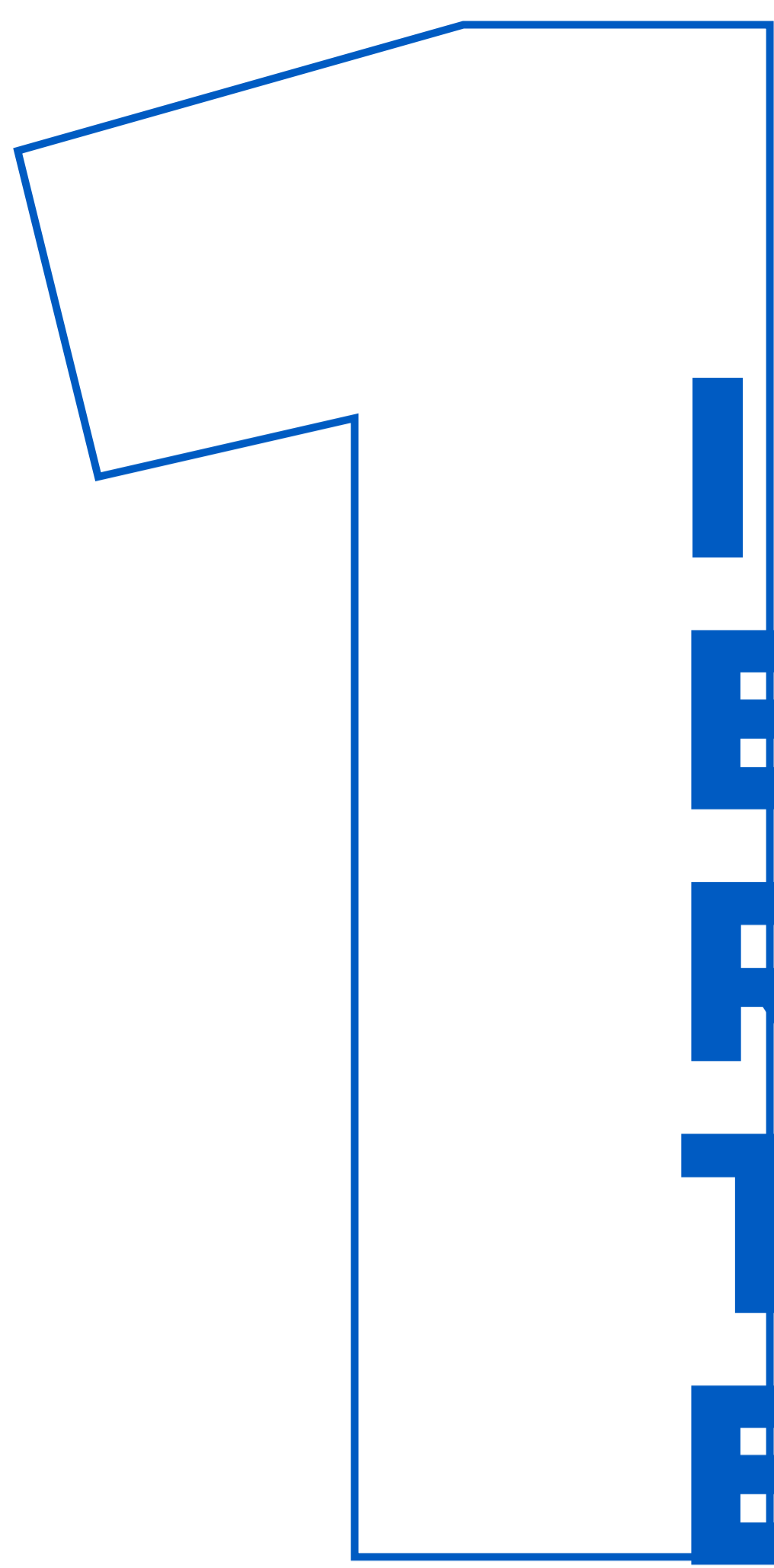
EMBRC CONTRIBUTIONS

30+ EMBRC services available

10-25 access requests for EMBRC services received/year from offshore windfarms, fisheries and aquaculture stakeholders

17 EU marine sites involved in EMBRC's EMO BON genomics observatory





INTEGRATE EMBRC'S SCIENTIFIC RESOURCES TO THE INNOVATION ECOSYSTEM

A growing number of EMBRC institutional partners are promoting the transformation of their technology platforms into Core Facilities.

These entities that are fully devoted to offer services, are not attached to research groups and are funded by a combination of internal budget and fee-for-service income.

Core Facilities are the missing building blocks to increase robustness and reproducibility in biomedical research¹.

A mapping of Core Facilities within EMBRC will be carried out and its community will be consolidated to

promote a bottom-up approach that will foster new technology developments and further professionalise EMBRC's technology offer.

Scientific networking between Core Facilities communities and private stakeholders will be promoted through the organisation of technology webinars, designation of technology ambassadors and scientific publications around EMBRC's technology expertise. Fostering discussions with technology producers will help to promote the co-development of new technologies and prototype testing. The already established Working Groups (EMBRC Strategy 2023-27) will be part of this initiative.

WHY CORE FACILITIES?

A Core Facility is an independent entity (not attached to a research group) sufficiently large to offer a range of applications at reasonable turnaround times to scientists from diverse affiliations laboratories. It is funded through a combination of user fees and institutional funds to support cutting-edge workflows and novel methods that require investments into implementation and development².

These entities will be key in the professionalisation of services within EMBRC and will allow optimal implementation of international quality standards and the identification of technology experts within our network. These structures will be promoted as the seeds for a technology push when interacting with industry.

1 Restivo et al.; Towards best practices in research; EMBO Reports; 2021; DOI 10.15252/embr.202153824
2 Meder et al.; Institutional core facilities: prerequisite for breakthroughs in the life sciences: Core facilities play an increasingly important role in biomedical research by providing scientists access to sophisticated technology and expertise; EMBO Reports; DOI: 10.15252/embr.201642857

2 INCREASE THE USE OF EMBRC SERVICES AND RESOURCES BY INDUSTRY

To position EMBRC technology platforms as leaders in their respective fields, a robust scientific and technological communication campaign will be implemented at an international level.

In collaboration with EMBRC's Communications Unit, a series of activities are scheduled, including the launching of the industrial webpage. This will be the main window for industrial users and prospective collaborators to get a taste of what they can get by closely engaging with EMBRC. We will produce a series of blog posts about technology, success stories, and opportunities to access platforms, and a set of branding assets providing a snapshot EMBRC's

unique offer (e.g. TPA catalogues and brochures) will be produced.

These assets will be accessible via EMBRC's website and presented during partnering events. Needless to say, social media posts are also arranged to boost the launching of all these materials.

Throughout all these campaigns, the industrial community will be informed of the opportunities for partnering with scientific and technology experts to develop their proof of concept and accelerate the maturation of the Technology Readiness Level of their innovation.



3 MEASURE AND REPORTING INNOVATION INDICATORS

To report the actual impact and uncover the potential of the infrastructure in the ocean economy, relevant data will be gathered to:

1. Identify the sectors of the ocean economy that EMBRC is concerned with (preferably, in order of relevance) and identify those into which it could be expanded.

2. Recognise EMBRC's technological expertise and define a strategy to drive innovation into these areas, regardless of their geographical distribution.

3. Generate a state-of-the-art portfolio of facilities divided by field of application (Technological Priority Areas) that will allow users to navigate easier through the 422 facilities.

4. Define workflow offers. Several facilities will appear to be requested in bundles, a list of this combination of facilities will be obtained from the TPA analysis. Workflows based on this data could be promoted and its provision could be improved (e.g. pre-approved contracts, agreements between facilities and sites to receive and send data or resources between them for a specific workflow, etc.)



IMPLEMENTATION AND REVIEW

The timeline for implementation of the Industrial Engagement Strategy is planned for 3 years. The operational plan will be revised once a year based on results, new elements, and feedback from the Scientific and Innovation Board.

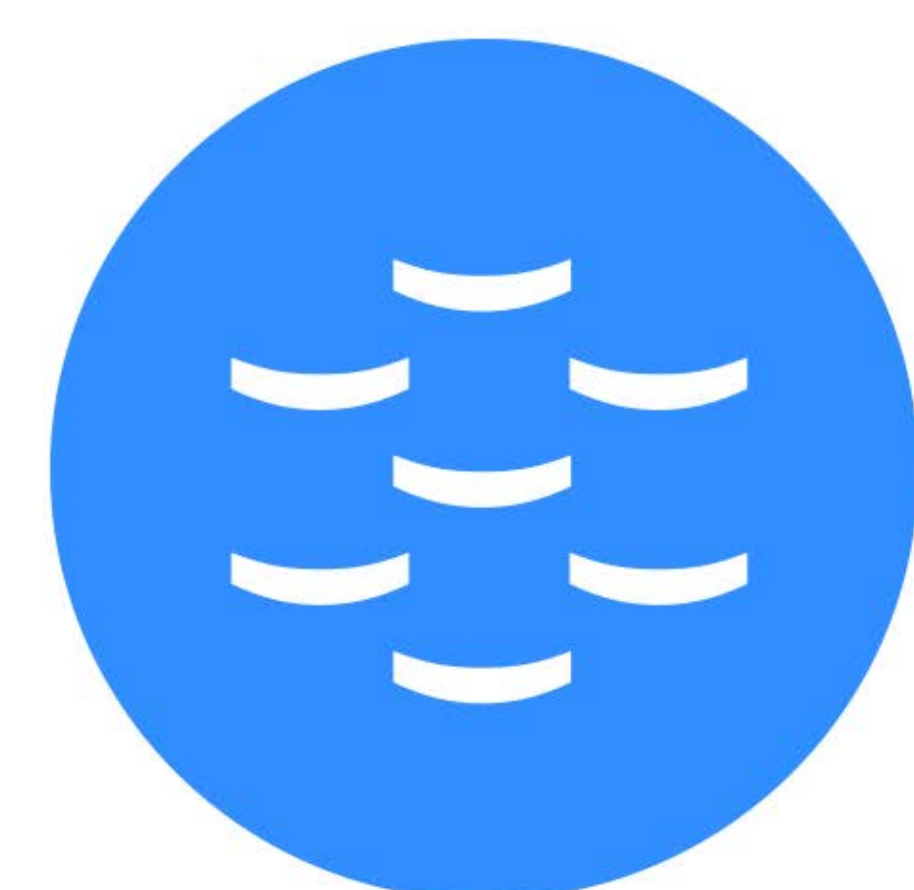
The implementation relies on the participation of all country members (Nodes) and is meant to serve its own innovation objectives and enhance their visibility and interactions with the private sector.



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