


# 3<sup>RD</sup> FORUM OF THE EU STRATEGY FOR THE ADRIATIC CATANIA 24-25 MAY 2018 AND IONIAN REGION



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**BIG - Blue Italian Growth**  
**the Italian National Technology Cluster**

A photograph of two fishermen in the ocean at sunset. The fisherman in the foreground is seen from the back, wearing a dark tank top, and is pulling a fishing net. The second fisherman, wearing a light blue bucket hat, is further out in the water, also pulling the net. The sky is filled with soft, colorful clouds in shades of orange, yellow, and blue. The water is calm with gentle ripples. Two large, curved, light blue arrows are overlaid on the image: one starts near the top text and points towards the bottom text, and the other starts near the bottom text and points back towards the top text, creating a circular flow.

Seas and Oceans represent a  
great opportunity for the Humanity

Seas and Oceans sustains us  
But for how much longer?

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## An incomplete list of threat

Climate change and impacts, Deep Sea Mining, Biological invasions, Marine Pollution, Natural Hazards, Munitions in the sea, Microplastic, Overfishing, Altered trophic cascades, etc.

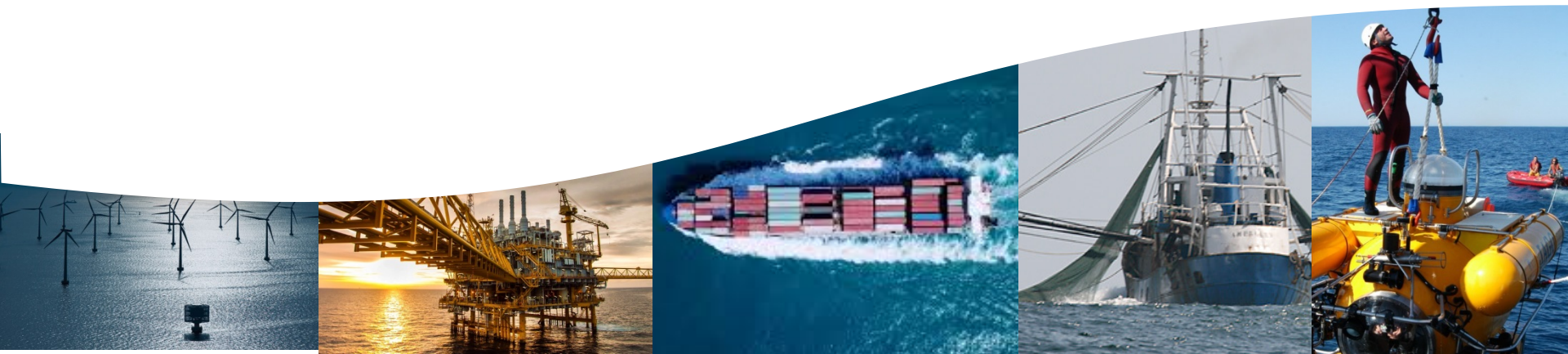


The 2014-2020 Italian National Research Program has identified 12 specific areas of competences - **including the Blue Growth** – in order to better structure and implement policies expected to significantly impact the social and economic development of the country.

- On August 2016, Ministry of University and Research has launched the call for the four remaining Clusters: *Energy*, *Cultural Heritage*, *Made in Italy*, and *Blue Growth*. CNR has proposed the consortium *BIG – Blue Italian Growth*

**BIG in numbers** - 133 partners, including:

- 29 Universities;
- All the national research centres (*CNR, OGS, INGV, INFN, ENEA, SZN, ISPRA*);
- Large industries: ENI, ENEL, FINCANTIERI, E-GEOS (Leonardo) , ....;
- SME from all over Italy;
- 5 regional technological districts;
- 11 regions. Abruzzo, Campania, Emilia-Romagna, Friuli-Venezia Giulia, Lazio, Liguria, Marche, Puglia, Sicilia, Toscana, Veneto



**BIG** is articulated in 6 research trajectories.

1. Marine environment and coastal zone
2. Blue Biotechnology
3. Renewable energies from the sea
4. Abiotic marine resources
5. Shipbuilding and Marine Robotics
6. Marine biotic resources

## Implementation Roadmap:

BIG aims at a quick start to reach following goals

Develop a **strategic plan** aimed at identifying **mid-term technological developments**, and to generate appropriate **technology roadmaps** where priorities and suitable forms of action are identified;

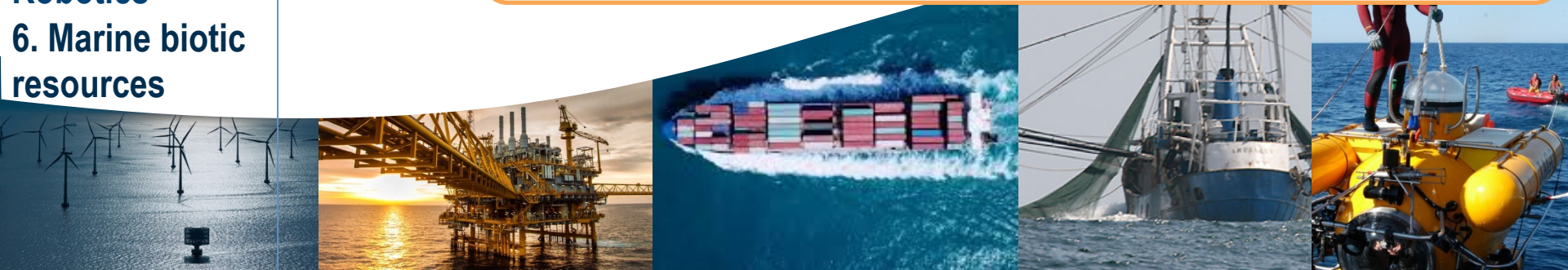
Bring to the **attention of political decision-makers the available technological opportunities**, as well as the related requirements in terms of infrastructures, training and human capital;

Mobilize both the **industry**, the **research** and the **training sectors** in order to implement (together with regional administrations) an extended national **partnership**.

Develop **public-private investment plans** with a focus on **research, innovation and knowledge** transfer;

Play a role of **coordination and promotion of access to European funding**, and to act as a reference point for promotion and cooperation activities at international level;

Disseminate information to the public in general, and to **promote knowledge sharing among public and industrial sectors**.



## **Marine environment and coastal zone**

*Maritime monitoring and surveillance, marine hazard, coastal protection, environmental intervention services, safety at sea and in the harbours, protection and greening of coastlands and harbours, protected marine areas, data integration, services for forecasting, pollution and discharges into the sea (including hazardous war debris), sensors for GES indicators*



## **Blue** **Biotechnology**

*bio-remediation,  
biopharmaceuticals,  
biomolecules,  
biomaterials*

*Pharmaceutical  
industry as well as  
in food, cosmetic,  
chemical, textile,  
environmental,  
energy and  
transformation  
processes, nano-  
biotechnologies  
and biomaterials  
(including  
engineered  
mimicking  
processes)*



## Renewable energies from the sea

*offshore wind energy,  
energy from waves and  
tides, marine  
geothermal energy,  
microbial fuel cell.*

*Design of:*

- *reduced-size plants  
operating in mildly  
harsh conditions  
(typical of the  
Mediterranean sea)*
- *multi-purpose  
platforms where  
integrated  
production  
processes (such as  
energy harvesting  
from wind and  
waves, water  
desalination and  
aquaculture) are  
optimized, also in a  
sustainable way*



## Abiotic marine resources

oil&gas, mining, methane hydrates, offshore CO2 storage.

Development of:

- techniques for assessing the true potential and the quality of available resources, and their characterization according to GES criteria;
- efficient and sustainable methodologies, systems and infrastructures.
- technological solutions for monitoring and mitigating potential impacts resulting from seabed exploitation.



## Marine biotic resources

fisheries and aquaculture,  
ecosystem services,  
reduction of the use of  
fishmeal, biodiversity and  
measures against alien  
species diffusion

Reduction of energy  
consumptions of fishing  
vessels, improved safety  
and welfare of the  
operators; new  
technologies (including  
ICT) to improve safety  
and economic  
performance; more  
efficient fishing systems  
(selective fishing,  
environmental impact and  
reduced scrap);  
innovative vessels;  
conservation  
technologies; technologies  
for contrasting IUU  
fishing.



## Shipbuilding and Marine Robotics

*new concept design for vessels, systems and infrastructures for harbour- and offshore- applications, marine robotics for monitoring and safety; decision support systems for navigation, automation (e.g. on-board diagnostics); motion control; dual technology; advanced materials; optimized solutions for offshore- and harbour- operations; intervention robotics (inspection, maintenance and dismantling); greening technologies and techniques for reducing hydroacoustic emissions; ICT and sensor processes*



# 3 transversal areas

## Skills&Jobs

Change of **learning pathways and of long-life learning**, imposed by the rapid development of both technologies and of socio-economic models, with an eye on the jobs lost due to disruptive technologies.

## Research infrastructures

Major investments. Optimized, both in terms of resource sharing and time availability. Attention on the **development of proposals aimed at increasing sharing and access to infrastructures**

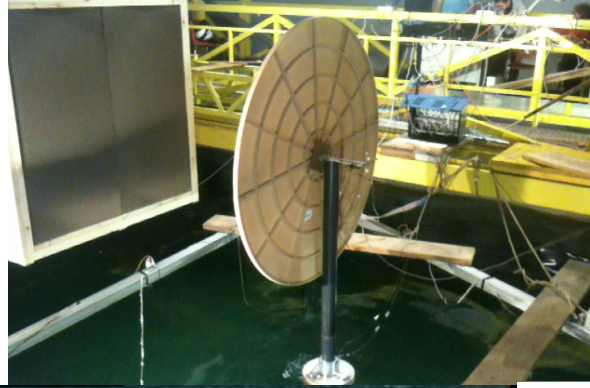
## Sustainability and economic uses of the sea

Analysis of the “economic uses of the sea”. Definition of **models** for the analysis of socio-economic and energy aspects associated with the **use of the offshore- and coastal-environment**

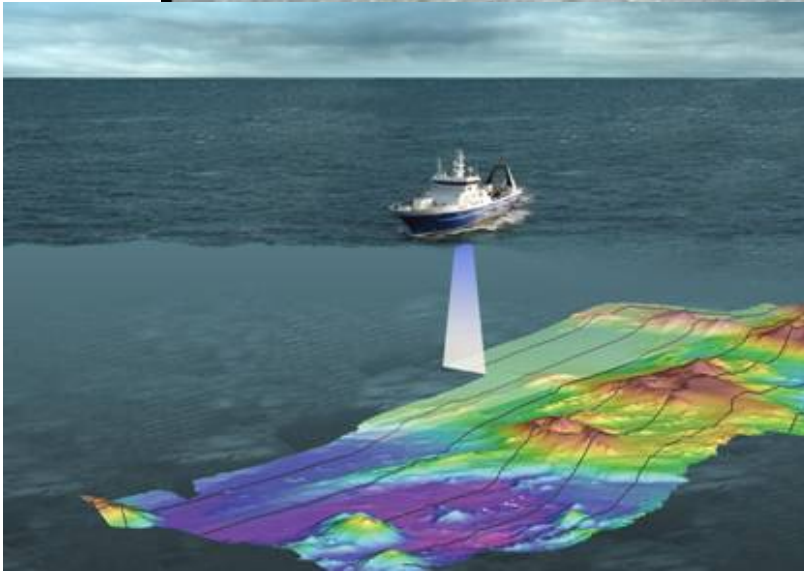
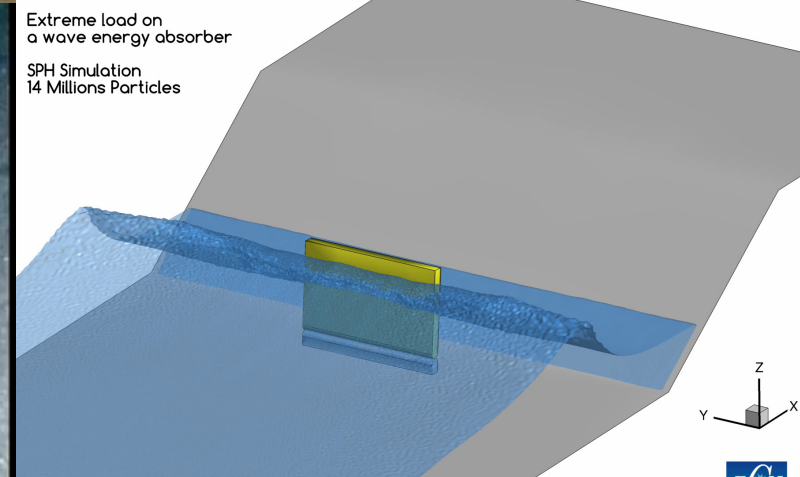


CTN BIG is set to stay  
in line with world and  
EU development  
trajectories:

**BLUEMED**  
**EUSAIR**  
**Waterborne<sup>TP</sup>**  
**JPI Oceans**  
**OECD**  
**Marine Board**  
**Copernicus**  
**EMODnet**  
**MONGOOS**



Extreme load on  
a wave energy absorber  
SPH Simulation  
14 Millions Particles



Vorticity

