



# Map of excellence - new potential in digital and green transformation in the blue economy

**Presentation of key results and updated Map of Excellence – presentation of innovative marine technologies - marine robotics and sensors and their successful implementation (Mateo Ivanac, CCE)**

**Conference on marine technologies and implementation for sustainable blue economy | Padova | 13th November 2024**

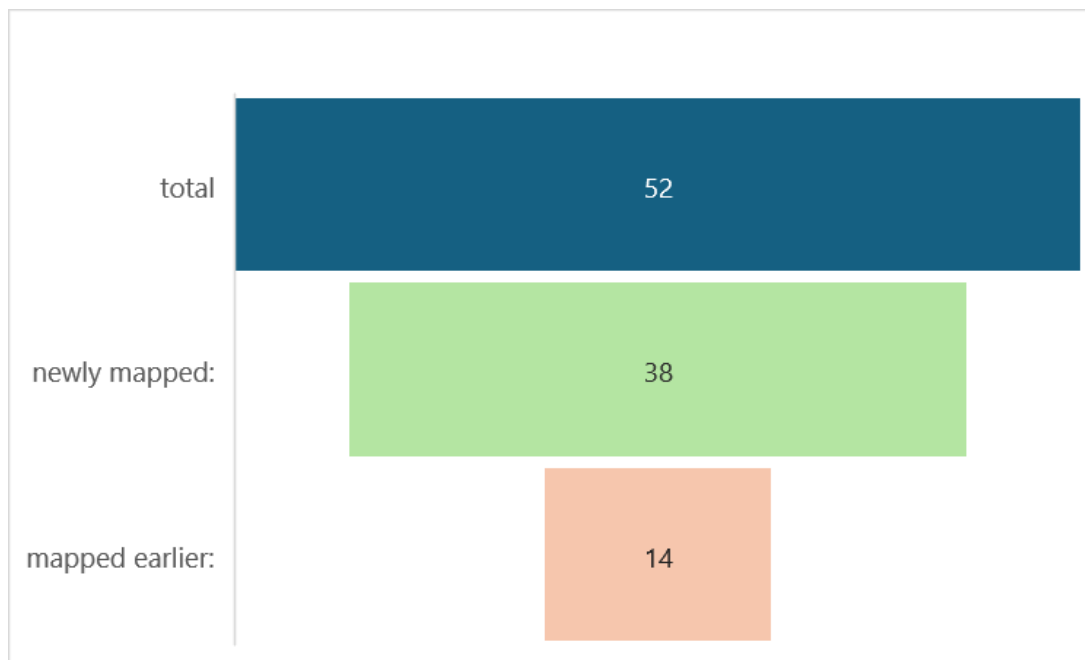
## Mapping activities

- Conducted as a part of the project DIH InnovaMare
  1. Mapping of examples of good practice in cooperation of private and scientific sectors and applied research to market in marine technologies
    - Phases:
      - Desk research
      - Interviews
  2. Mapping of young researchers on cross-border level in field of marine technologies for expanding Innovamare map of excellence
    - Phases:
      - Desk research
      - Interviews

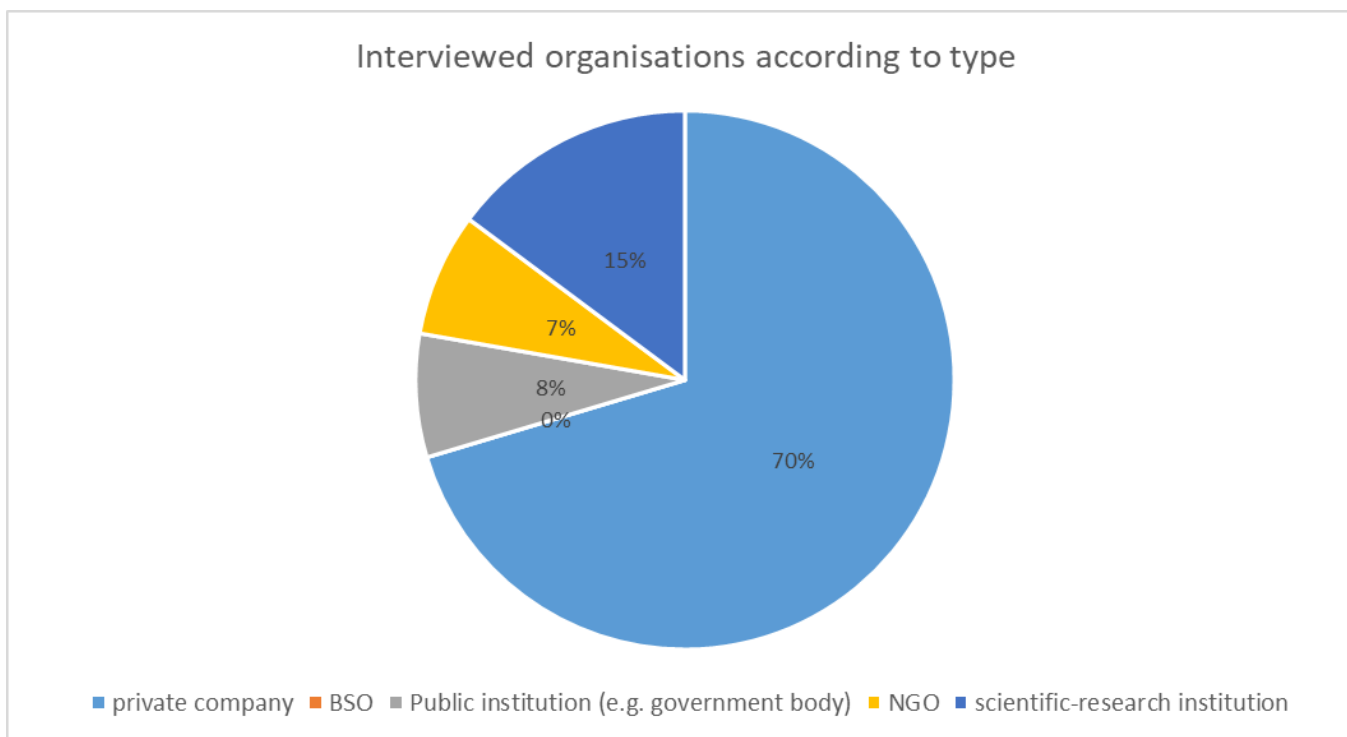




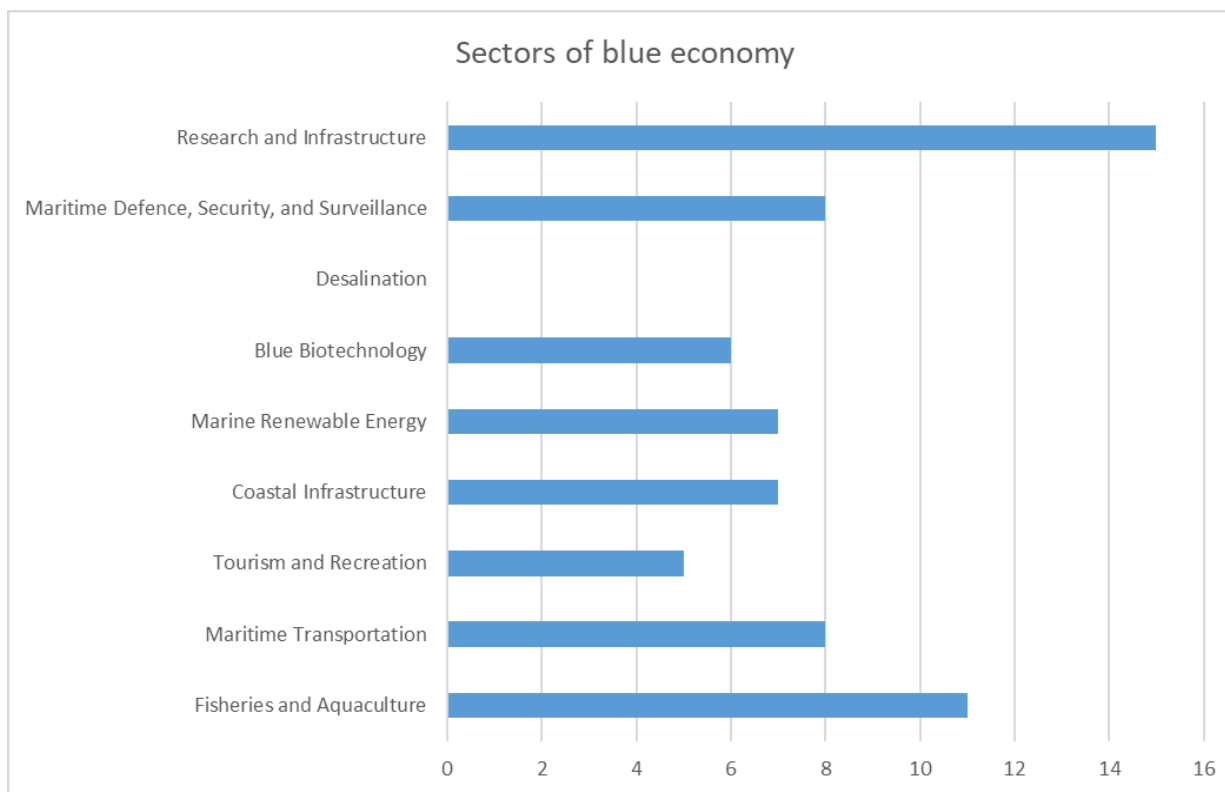
## Mapping of use cases – **desk research** results



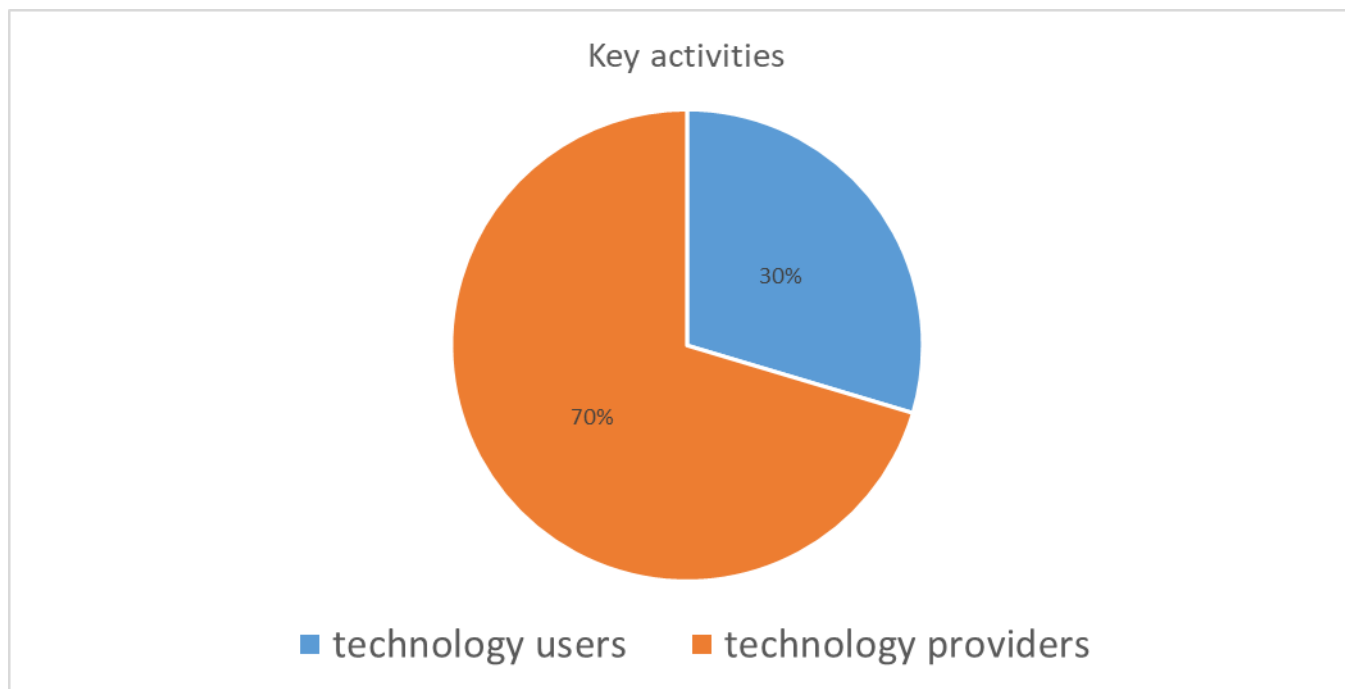
## Mapping of use cases – results after conducted interviews



## Mapping of use cases – results after conducted interviews

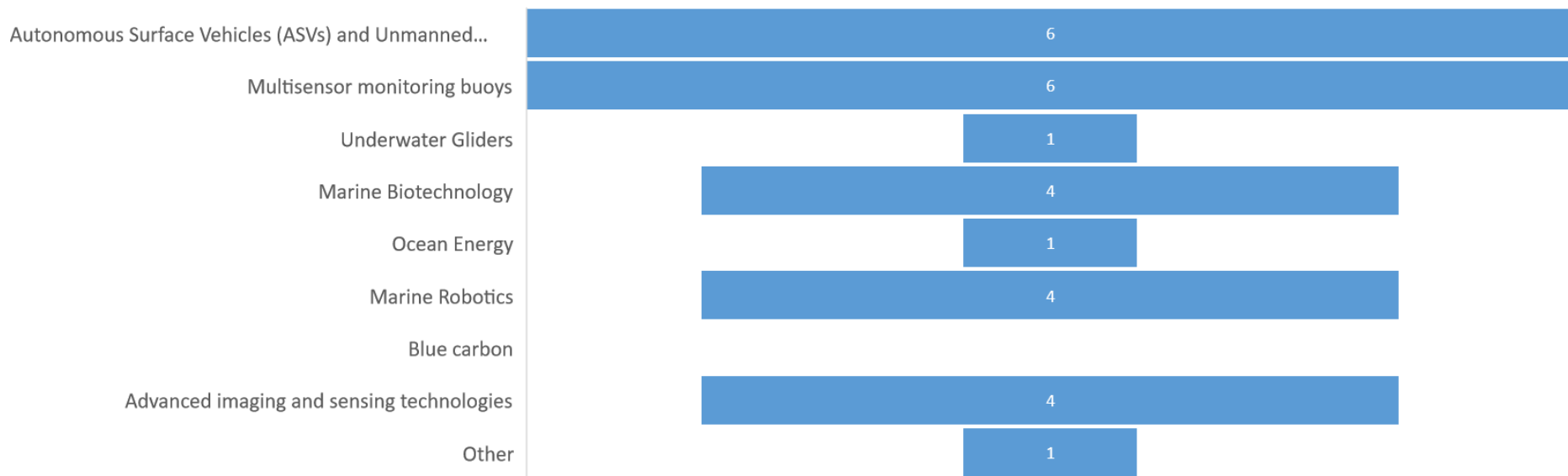


## Mapping of use cases – results after conducted interviews



## Mapping of use cases – results after conducted interviews

Technology implemented in use case - for providers only



## PROVIDERS/ Technologies implemented and additional technologies or applications

Main Technologies	Additional Technologies or Applications
Marine Robotics	Advanced imaging and sensing technologies Multisensor monitoring buoys
Autonomous Surface Vehicles (ASVs)	Onboard ship systems: Damage Control Systems, Decision Support Systems, Stability Systems, Simulation Stability Systems  Integrated multi-system solutions for situational awareness in maritime environments
Advanced Imaging and Sensing Technologies	Imaging spectroscopy  Coastal Intelligence - surveillance and environmental monitoring
Marine Biotechnology	Technologies related to the use of marine organisms for pharmaceuticals, biofuels, and environmental monitoring  Nature-based Solutions for Water Management
Health management system for aquaculture	Monitoring and controlling systems for aquaculture production





<b>USERS / Use cases</b>	<b>Key Activities</b>	<b>Benefits</b>
<b>Environmental Monitoring</b>	Real-time monitoring of environmental conditions; collecting data to understand environmental phenomena.	Enables timely and efficient on-site actions, enhances understanding of environmental impacts, and supports remedial measures.
<b>Resource Management</b>	Utilizing underwater communications and sensor networks for improved data collection.	Provides precise data for efficient operations and better resource management, promoting sustainability.
<b>Operational Efficiency</b>	Development of advanced digital technologies such as digital twins for monitoring and predictive maintenance.	Improves efficiency and reduces operational costs through enhanced monitoring and control systems, supporting decarbonization efforts in the transport industry.
<b>Safety and Risk Management</b>	Underwater imaging and sensors to minimize risky human interventions.	Increases safety by reducing the need for human intervention in hazardous underwater environments, leading to fewer accidents and enhanced operational safety.
<b>Hydrogen Fuel Cells</b>	Introduction of hydrogen as a fuel source for ships, including the development of hydrogen refueling stations.	Significantly reduces greenhouse gas emissions and harmful pollutants, contributing to cleaner maritime operations and supporting the transition to alternative fuels.
<b>Decarbonization of Ports</b>	Development of green ports, focusing on energy efficiency and sustainability initiatives.	Positions ports to meet EU sustainability policies, enhance operational efficiency, and help reduce costs associated with environmental compliance.
<b>Data Collection and Sharing</b>	Field data collection and return to public institutions to inform policy and decision-making.	Promotes transparency and enhances public understanding of environmental conditions, supporting better regulatory frameworks and community engagement.



## USERS / Key issues & resources

Key Resources	Key Issues
Infrastructures (R&D labs, testing labs, Fablabs)	Environmental sustainability; port sustainability
Technologies with patents	Challenges in hydrogen production and usage
Non-formal environmental education methods	Stakeholder engagement and interest



## USERS / Key impacts and challenges

Impact for Users	Impact on the Environment	Key Challenges/Limitation
Reduced greenhouse gas emissions (GHG)	Climate change mitigation and adaptation	High energy requirements for hydrogen production leading to potential pollution; safety and technology limitations in hydrogen transport.
Improved operational efficiency in ports	Sustainable use and protection of water and marine resources	Low interest from stakeholders in new technologies; lack of strategic environmental plans.
Enhanced environmental education	Pollution prevention and control	Economic instability leading to prioritization of business models over sustainable investments.

The interplay between **key resources, impacts, and challenges** highlights the complexity of implementing Blue Economy applications. **Stakeholder engagement, economic challenges, and technological limitations** will be crucial for success.

A coordinated approach that leverages existing resources, encourages stakeholder participation, and fosters innovation is essential for advancing the Blue Economy effectively.



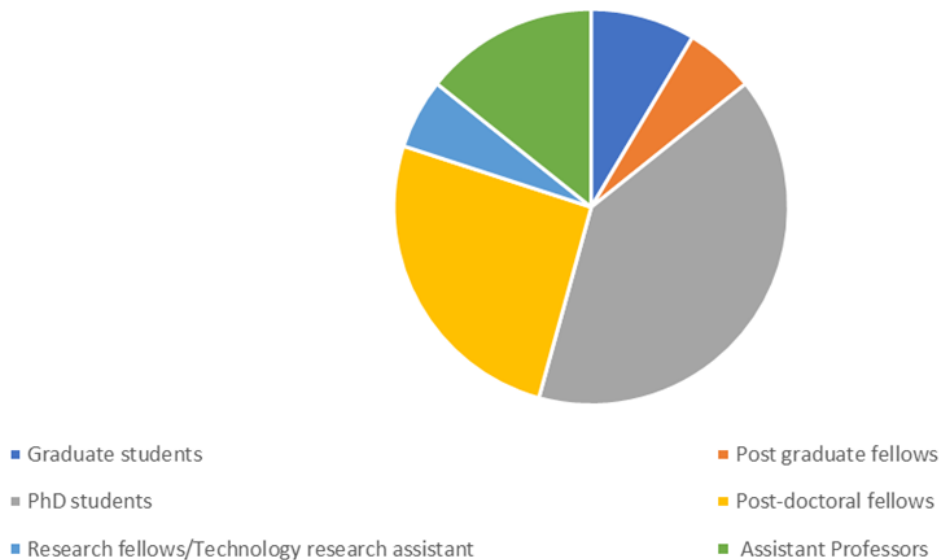
## Conclusion

- The strong adoption of marine technologies reflects a promising, innovative future, but the continued growth and resilience of the Blue Economy will depend on fostering collaboration across diverse sectors.
- The successful implementation of Blue Economy applications hinges on the ability to balance sustainability, efficiency, and safety while leveraging advanced technologies and innovative solutions.
- Stakeholders must continue investing in research, technology, and collaborative efforts to unlock the full potential of marine and coastal ecosystems.
- Partnerships across private companies, research institutions, and public entities will enhance knowledge sharing, resource allocation, and innovation.
- By embracing a coordinated, cross-sector approach, the Blue Economy can achieve its goals of environmental stewardship, operational efficiency, and economic development, benefiting both marine ecosystems and coastal communities.



# Mapping of young researchers – total 34

Structure of Mapped Young Researchers after Interviews



# Analysis of Young Researchers by Focus Areas

Natural sciences - biology & Biotechnology



- Marine biology
- Fish biology
- Physiology
- Aquatic Animal Models Biology
- Aquaculture and Aquaponics
- Ecological Restoration
- Environmental Microbiology

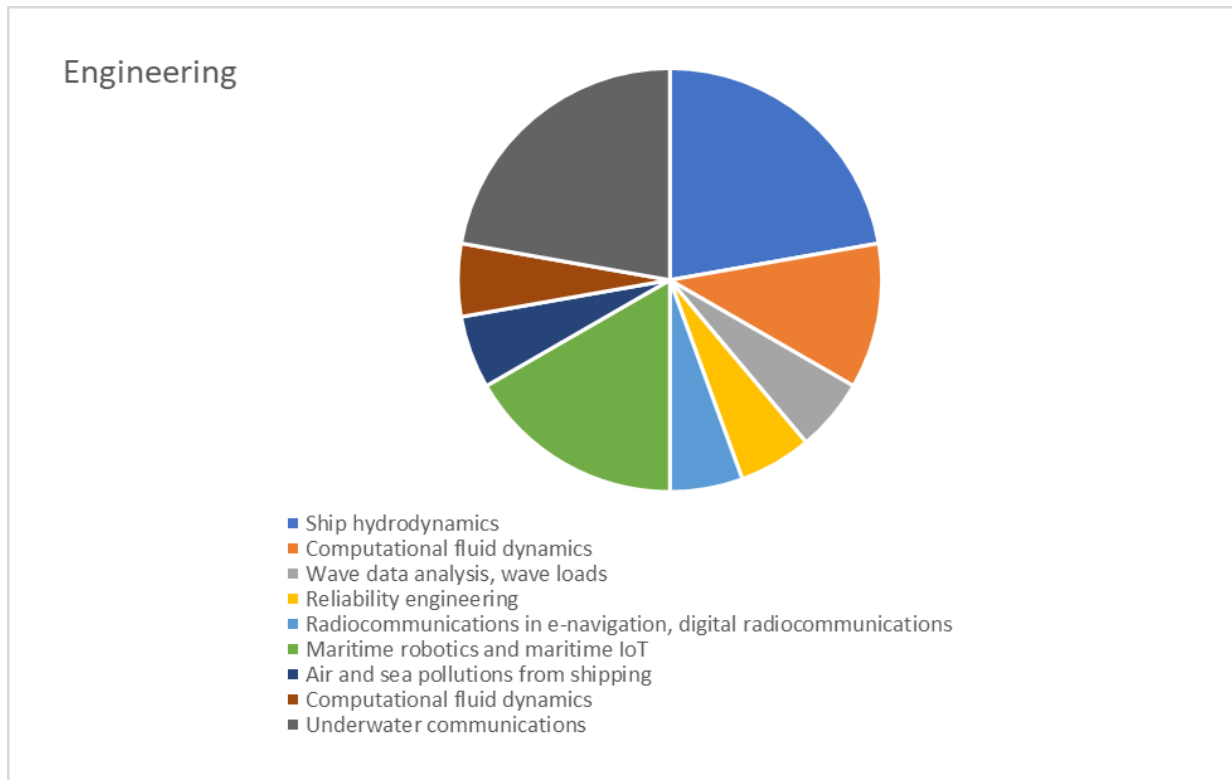
Natural sciences - chemistry and Ecotoxicology



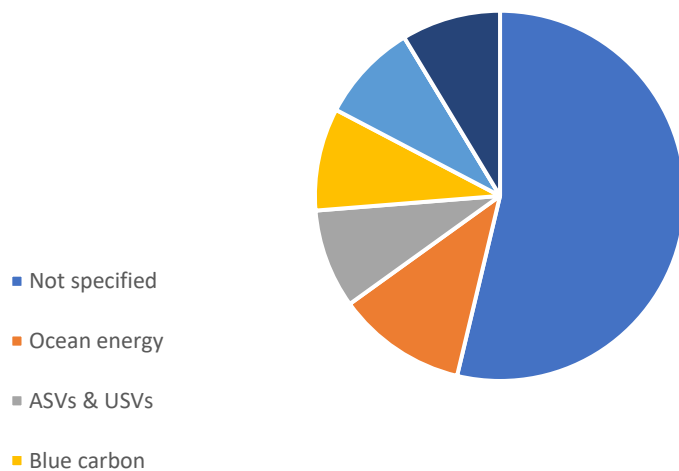
- Organic matter and atmospheric organics
- Microplastic
- Trace metals
- Marine sediment pollution



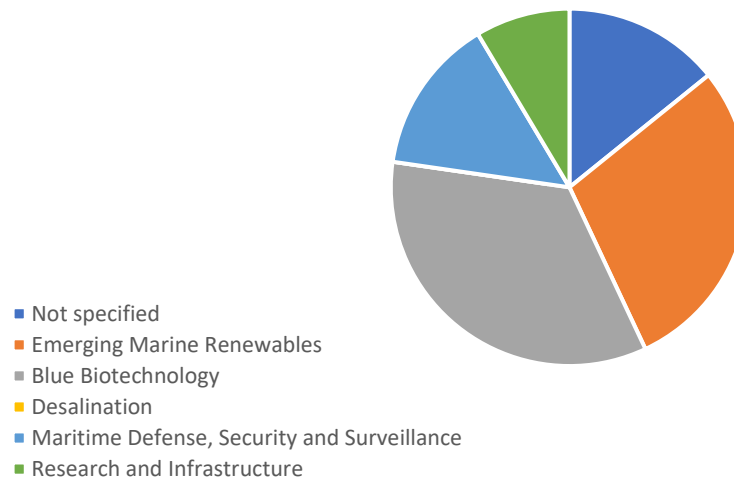
# Analysis of Young Researchers by Focus Areas



### Interest in Marine technologies



### Interest in Emerging Blue Economy Sectors





## Conclusion

- The majority of young researchers interviewed through mapping were related to marine biology and mechanical, hydraulic, and communications engineering.
- A large portion of young researchers focuses on sustainability and on enhancing the protection and safeguarding of marine ecosystems as crosscutting.
- The matching between young researchers and the business world can and must undoubtedly be strengthened: the way forward is certainly that of reciprocity of opportunities for meeting and exchange that can also be facilitated by the activities of cross-border cooperation projects.



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 DIH InnovaMare

Thank you

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