



Sustainable Sea and Ocean Solutions

Intelligent Technologies for the Blue Economy



Mastering the green-blue transition while restoring our oceans

Fraunhofer – together with its partners SINTEF, VTT, RISE, TNO, TECNALIA, +Atlantic CoLAB, AZTI, ENEA and Ifremer – proposes the Innovation Platform »Sustainable Sea and Ocean Solutions ISSS« in order to boost the Green Deal and the Blue Growth in emerging, established and associated Blue Economy sectors.

The mission is the responsible utilization of our oceans, to harness their potential and create more value and more jobs in the European marine and maritime sectors, within the Blue Economy, by developing and mastering new technologies to ensure European industry leadership in global markets and achieve UN Sustainable Development Goal 14.

The Innovation Platform »Sustainable Sea and Ocean Solutions ISSS« therefore aims at key enabling technologies for in-depth technological innovations and solutions for subsea and ocean activities, as well as at shared infrastructures and data platforms through cross-cutting collaboration to ensure healthy and resilient oceans.

It will focus on European subsea activities and cross-link relevant national and European initiatives to form an integrated whole to foster technological innovations and applications in the field of e.g. underwater robotics and automation, underwater sensors and actuators, underwater materials, communication and digitalization. This will ensure safe, cost-effective and sustainable offshore operations and provide reliable and accurate data and information on the ocean for better-informed decision-making by policy makers, businesses and investors.

Accelerating the development and transfer of technologies

The objectives are to accelerate the development of new technologies and materials as well as their application and fast implementation in industrial processes and adaptation within the Blue Economy sectors. By investing in infrastructure and intelligently networking existing structures, a research and innovation platform for subsea technologies will be the world's most efficient innovation provider for applied R&D. To this end, the Innovation Platform »Sustainable Sea and Ocean Solutions ISSS« addresses entire value chains of the Blue Economy: from building subsea infrastructures to establishing their logistics chains.

As a joint European endeavor, the Innovation Platform aims at minimizing risks for all partners involved, specifically when addressing complex and high-investment research topics such as automated subsea operation technologies and autonomous platforms that are robust, resource and cost efficient.

The aim is a fast transfer into industrial applications within the three central application areas

- Aquaculture
- Ocean Cleaning
- Energy and Raw Materials Harvesting

as well as within the implementation areas of Europe's sea basins. The application area Aquaculture comprises all value chains related to the extraction of marine living resources with the goal of expanding blue biotechnology. The application area Energy and Raw Materials Harvesting comprises all value chains related to renewable energy, such as offshore wind and ocean energy, as well as the extraction of marine non-living resources. The application area Ocean Cleaning comprises all value chains related to the removal of marine litter, such as plastic waste (micro- and macroplastics) and removal of unexploded ordnance.



Recommendations for healthy oceans and sustainable growth

- **Coordinated investments:**
The European coastal states already operate various but distinct marine and subsea facilities. Coordinated investments should connect these facilities and enable cross-border collaboration. This requires a decentralized marine and subsea infrastructure, multipurpose platforms for flexible operations, solutions for subsea positioning, and a marine data space for joint data analyses and AI systems.
- **Enabling policies:**
The EU single market rules should be fully applied to the marine/subsea sector to facilitate uniform and effective development of industrial value chains, thus guaranteeing a single market without barriers. Accordingly, a coherent framework for a joint European marine policy is required, specifically addressing subsea demands. In addition, excellence in education and training for marine/subsea aspects should be included in the EU's strategic policies.
- **Broad support for research and development for fast transfer:**
Particularly when sustainability is required, subsea technologies demand a high degree of innovation and therefore broad support for R&D actions. Such actions should intensify applied research in the application areas Aquaculture, Energy and Raw Materials Harvesting, and Ocean Cleaning; the development of sustainable methods and technologies to increase production efficiency and effectivity while maintaining environmental compatibility; the consolidation of fundamental research and applied R&D to meet the requirements of the maritime and subsea industry.
- **Higher investor and citizen engagement:**
Investors need to channel capital away from environmentally harmful activities toward opportunities in sustainable solutions. The UN Decade of Ocean Science for Sustainable Development (2021-2030) must be used to mobilize all stakeholders for sustainable European Blue Growth in line with the European Green Deal.

Using the momentum for innovation and change

The Innovation Platform »Sustainable Sea and Ocean Solutions ISSS« will facilitate Europe's technological independence particularly in subsea technologies, but also in all related cross-cutting technologies. Coastal regions are ideal for marine technologies and often represent, in an economic sense, less developed regions of EU countries. The placement and development of specific subsea technologies and competencies in these regions will reduce economic inequality in and among EU member states, thus stabilizing societies and helping to reduce dependence on such industries as fishery and tourism. The application area Ocean Cleaning in particular has an enormous social dimension as it tackles a key issue of humanity: marine litter, such as plastic litter and unexploded ordnance, strongly affecting our ecosystem and threatening our health as well as society's safety and security.



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Photo acknowledgments

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