ECCENTRIC - Enhancing Circularity in the Adriatic Area

Promotes sustainable economic development in maritime and coastal sectors in the Adriatic region.

How: Collaboration between SMEs and research institutions. We support the "twin transition," combining digital and green innovation to develop new market and society oriented solutions.

Goal: the shift toward circular economy by enhancing the competitiveness of SMEs and fostering technological and entrepreneurial solutions that address both environmental and market challenges.

Key outcome: **3 Strategic Roadmaps (one map per each thematic sector)** as tools to shared vision for the future development of each sector:

Marine Energy | **Safety and Surveillance** | **Infrastructure**

Marine Energy roadmap: To assess current trends in the Blue Economy Sector we surveyed 75 SMEs, industry associations, agencies, research bodies, and policymakers that are actively involved in the **Marine Energy, Safety&Surveillance and Infrastructure sectors. Based on their feedback we have developed the roadmap.**

1. Interviews with SMEs and stakeholders aimed at identifying needs and barriers to development
2. Analysis of technological and economic trends conducted through a review of emerging technologies
3. Organization of seminars and workshops designed to validate preliminary findings and co-design future actions

ECCENTRIC participants

Italian Stakeholders

Croatian Stakeholders

- Companies
- Universities / Research Centers
- Public Bodies and Agencies
- Associations / Chamber of Commerce
- NGOs / Foundations / Non-Profit
- Incubators / Cluste / HUBs
- Technical Training and ITS

Interreg — Co-funded by the European Union

Italy – Croatia

ECCENTRIC

TRASFERIMENTO TECNOLOGICO INNOVAZIONE SISTEMA CAMERALE VENETO

MARINN

mare FVG Technology Cluster

HGK HRVATSKA GOSPODARSKA KOMORA

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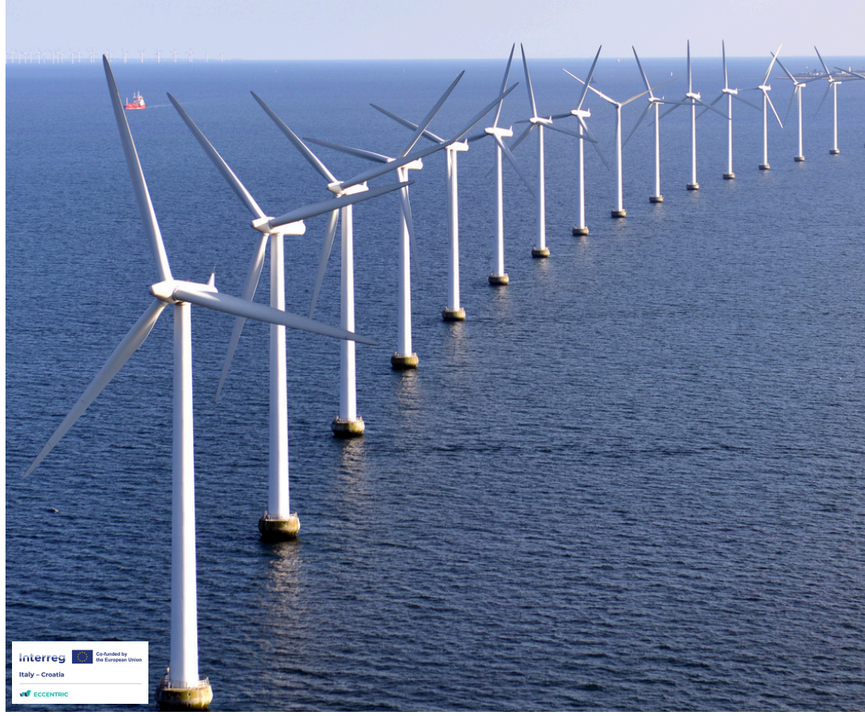

BLUE MARINE ENERGY ROADMAP

Technologies | **Business Models** | **Investments**

MARINE ENERGY Strategic Development Roadmap

- Increase in regasification capacity.
- Promotion of EU-funded pilot projects on floating offshore wind technologies; support for demonstrators in real marine environments.
- Cross-border networks between SMEs, research centers, and testing facilities; joint platforms focused on composite materials and lightweight blades.
- Modular textile blades by ACT Blade; digital twin and AI tools; sensors for monitoring; lightweight and recyclable technologies.
- Streamlining of certification procedures for non-conventional materials; incentives for innovative technologies in public tenders.
- Pilot projects in the Adriatic Sea; first-mover positioning in the floating wind market in Southern Europe.
- Installation of a 1 MW marine energy system, in collaboration with local authorities and energy companies.

- Diversification of LNG imports from various countries to strengthen national energy independence.
- Optimization of energy systems.
- Energy storage and adaptive controls for local energy distribution, in collaboration with the EU and academic institutions.
- Development of regional supply chains for blade manufacturing, installation, and maintenance.
- Automation of blade production and maintenance; integration of structural health monitoring sensors.
- Growth of the blue economy through regional manufacturing hubs; participation in international consortia.
- Development of innovative business models such as “blade-as-a-service” or leasing.
- Integration of sustainability criteria in design (carbon footprint, recyclability).

- Strategic partnerships with research institutions and companies for the development of innovative and sustainable solutions.
- Scaling up to 5 MW, integration with renewable sources and AI, in collaboration with international organizations.
- Integration into circular economy models for marine energy; creation of a European certification framework.
- Fully recyclable blades, bio-based composite materials, smart coatings, and AI for autonomous monitoring.
- Technological leadership in next-generation floating wind farms; access to markets with strict environmental standards.

Technologies

Subsector	Technologies	Short/Mid term trends	Future Vision
Offshore Wind Energy	Floating wind platforms, next-generation turbines, mooring systems.	Expansion of floating offshore wind farms in deep waters.	Development of large-scale floating wind farms, integrating AI-driven efficiency monitoring, turbine placement and storage and transmission solutions.
Marine Solar Energy	Flexible solar panels, floating platforms, anchoring systems; Corrosion-resistant PV materials, AI-driven efficiency optimization.	Expansion of hybrid solar-wind platforms for consistent renewable energy output; Enhanced durability of floating solar panels to withstand marine conditions.	Large-scale deployment of marine solar farms integrated with offshore wind and energy storage; Integration of AI-based predictive maintenance and automated cleaning systems.
Offshore Hydrogen Production	Electrolysis units, hydrogen storage, subsea pipelines; Floating storage, hydrogen bunkering infrastructure.	Increased investment in offshore hydrogen hubs, leveraging multiple renewable sources; Testing of liquid hydrogen and ammonia as carriers for long-distance transport.	Development of offshore ammonia/methanol production for easier hydrogen transport; Deployment of hydrogen-powered vessels and fueling stations in offshore locations.
Wave and Ocean Energy	Oscillating water column, point absorber buoys, overtopping devices; Wave-driven pumps, pressure differential systems.	Research into hybrid wave-wind solutions and small-scale applications; Integration of wave-powered desalination with offshore renewable grids.	Development of hybrid offshore energy farms integrating wind, waves, and solar power; Full-scale deployment of autonomous wave-powered desalination plants.

Business Models

Key Partners: Strong collaboration between public and private sectors: governments, energy companies, tech suppliers.
Key Activities: Continuous investment in R&D, performance monitoring, specialized maintenance.
Value Propositions: Renewable energy production, CO_2 reduction, energy security, positive impact.
Customer Relationships: Long-term contracts, public education and awareness, operational transparency.
Customer Segments: Utilities, governments, industries, local communities interested in sustainability.
Key Resources: Advanced technologies, skilled human capital, access to public and private funding.
Channels: Sales through utilities, partnerships, use of media and digital channels for communication and advocacy.

Investments

Public - EU

- **EMFAF**
- **HORIZON EUROPE**
- **CEF-Energy**
- **Sustainable Blue Economy Partnership**

These instruments support innovation in emerging Blue Economy sectors, such as renewable energy and technological research. Between 2018 and 2023, investments in the Blue Economy tripled, exceeding €13 billion, with most deals occurring within the EU. A significant share of capital also comes from non-EU investors, highlighting the global appeal of EU-backed marine innovation.

Public - National/Regional

At national and regional level, the marine energy sector is supported by targeted grants, co-investment programmes and innovation infrastructures such as incubators and pilot hubs. The marine energy sector benefits from national programmes, including **PNRR – SEARES** (Italy) **ZD2P/ZD3P - HBOR - CoE MARBLE** (Croatia). To fully realise the sector’s potential, greater alignment with EU strategies and greater integration of private capital are needed. Strengthening synergies between public initiatives and market-driven investments will be key to increase impact and foster sustainable growth.

Private

Private investments are limited, especially for early-stage SMEs. To address this, a growing network of private investors—venture capital, business angels, and private equity—supports startups through funding rounds and strategic guidance. Most deals involve mergers and acquisitions (38%), followed by early-stage equity (34%) and growth equity (11%), while late-stage investments remain scarce, indicating a young market. Many of that are interested on sustainable marine resource use and innovation for ocean healt.