



Funded by the European Union

Factsheet #2



Driving Innovation for Green, Digital, and Smart Maritime Ecosystems

PROGRESS OF THE PROJECT

OVERALL PROGRESS OF THE PROJECT – SPECIFIC OBJECTIVES, MILESTONES

Develop the joint R&I strategy for strengthening the maritime innovation ecosystems' excellence (WP2).

- ✓ In-depth mapping of the ecosystems
- ✓ Gap analysis, R&I needs and opportunities identified
- ✓ Long-term joint R&I strategy improved (M18)

Develop the joint action & investment plan for building coordinated, resilient, attractive and sustainable maritime innovation ecosystems (WP4).

- ✓ Synergies with ongoing national, EU projects
- ✓ Joint Action and investment plan including monitoring methodology improved
- ✓ M7 - Completion of a stakeholder consultation for the action plan completed

Enhance the level of collaboration within and between place-based ecosystems through innovative approaches to knowledge transfer, community engagement and competence building (WP6).

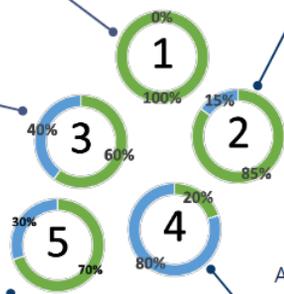
- ✓ 60 (85)+ events, 600 (1000) + persons involved
- ✓ Career Connector platform established and functional, stakeholders and job seekers profiles

Contribute to knowledge gaps in maritime R&I through co-design and joint implementation of three pilot projects by ecosystem actors (WP3).

- ✓ Pilot projects development plan
- ✓ Algorithms developed and data used
- ✓ Concepts and models developed (TRL 3-4)
- ✓ Scenarios tested and validated
- Draft plan for implementation (future collaborative R&I actions of the ecosystems' actors based on the lessons learnt from the R&I pilot projects, infrastructure)
- Publications (ongoing): SCI articles, conferences

Accelerate the uptake of new technologies by the ecosystems' industry through preplanning for pilots and demonstrators based on the three R&I pilot projects (WP5).

- Collecting, analysing data from WP2, WP3 and WP4
- Evaluating the Pilot projects results, models and developed technologies – developing roadmap
- Pre-planning for pilots and demonstrators based on the three R&I pilot projects



MILESTONES

Milestone Name	Means of Verification	Due Date, (month)	Status
M7 - Completion of stakeholder consultation for the action plan	Data validated for completeness and quality	December 2024	✓
M8 - First roadmap complete	M8 - First roadmap complete	December 2025	✓

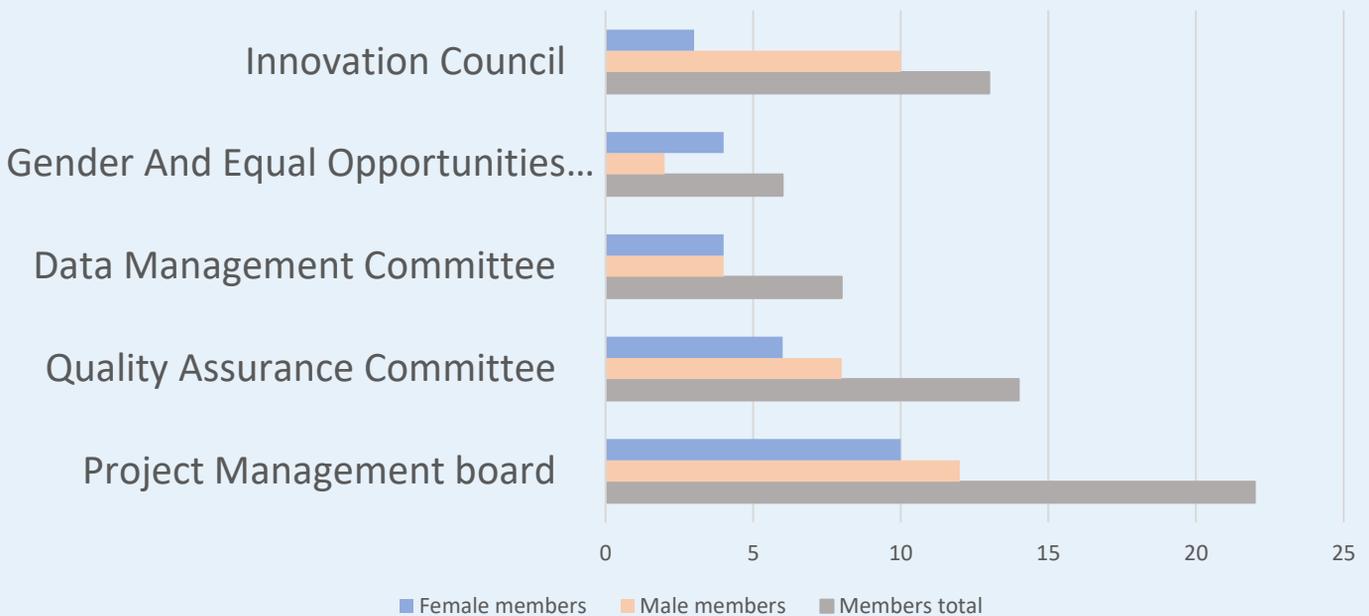
DELIVERABLES SUBMITTED

No	Deliverable Name	Due Date
D7.1	Dissemination, exploitation and communication plan – first version, improved and resubmitted	June 2025
D2.3	Long-term joint R&I strategy, improved and resubmitted	June 2025
D3.2	Prototypes and validation of three joint pilot R&I projects	June 2025
D4.1	Action and investment plan including monitoring methodology	June 2025
D3.3	Implementation of Pilot projects and lesson learnt on different areas and for different scenarios	December 2025

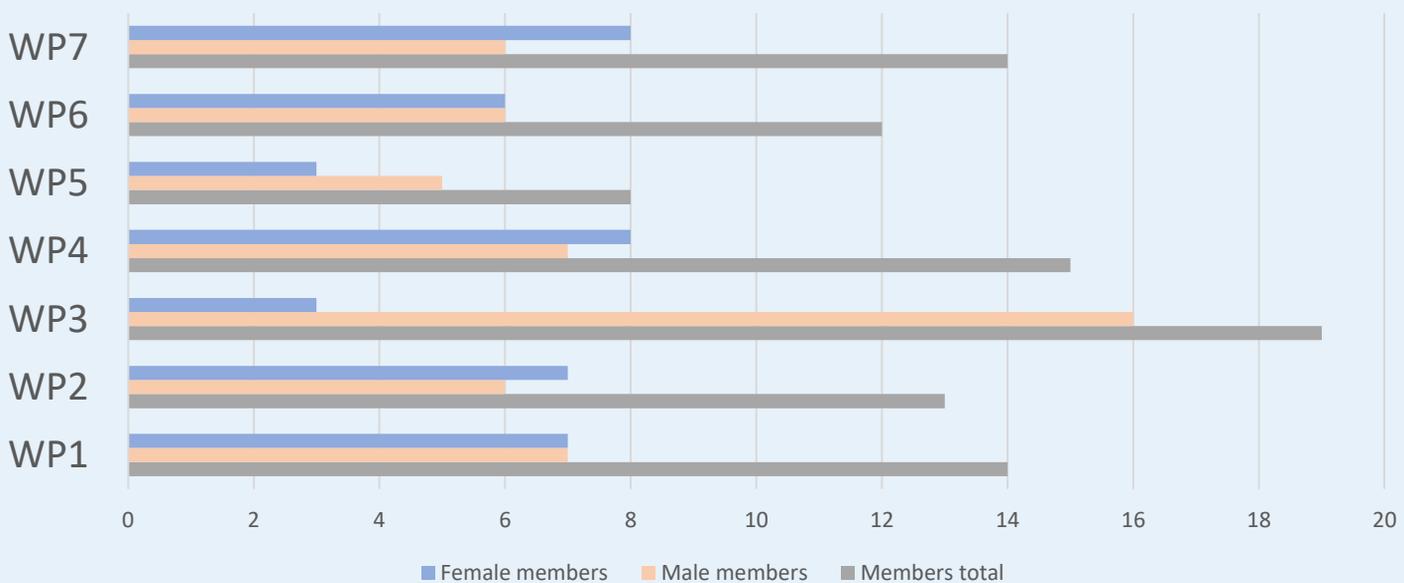


GENDER MONITORING

Governance and operational bodies



Working groups



CROSS-BORDER JOINT R&I STRATEGY

VISION STATEMENT

Western Slovenia and Adriatic Croatia are innovative, resilient and sustainably using marine space and resources contributing to emission reduction and supporting blue economy growth. The maritime research and innovation ecosystem of the region is globally recognized and adaptive, fostering Adriatic Sea cooperation, knowledge sharing and advances in innovation and technology.

STRATEGIC OBJECTIVES

1. Digital advancement of the maritime innovation ecosystem

2. Green transition of the maritime innovation ecosystem

3. Attractive and in full capacity maritime innovation ecosystem labour market

4. Excellence in Maritime Innovation Ecosystems' governance



R&I PILOT PROJECTS

PILOT PROJECT 1 - IMPROVED FIRE EVACUATION VR MODEL OF A SHIP ENGINE ROOM

Papers & Conferences:

- Glujić, Vukelić, Bernečić, Vizentin, Ogrizović. Coupling CFD and VR for advanced firefighting training in a virtual ship engine room, *Results in engineering*, 2024. <https://doi.org/10.1016/j.rineng.2024.103025>
- Vukelić, Ogrizović, Bernečić, Glujić, Vizentin. Application of VR Technology for Maritime Firefighting and Evacuation Training - A Review, *Journal of marine science and engineering*, 2023. <https://doi.org/10.3390/jmse11091732>
- Glujić, Vizentin, Vukelić, Bernečić, Ogrizović. Advanced Integrated CFD-VR Model of Ship Main Engine Fuel Line Fire, 26th Symposium on Theory and Practice of Shipbuilding, Zadar, 2024. https://sorta.fsb.hr/images/SORTA_2024_Book_of_Abstracts.pdf
- Glujić, Vizentin, Vukelić, Bernečić, Ogrizović. Advanced CFD Fire Model in Ship Engine Room with VR Integration, International Association of Maritime Universities (IAMU) Conference, Boston, 2024. <https://aga24.maritime.edu/wp-content/uploads/IAMUC-2024-proceedings-final-corrected.pdf>

PILOT PROJECT 2 - DIGITAL TWIN WITH AI FOR SUSTAINABLE AND EFFICIENT ENERGY MANAGEMENT

Papers & Conferences:

- Vuzem, F.J.; Pipan, M.; Zupan, H.; Šimic, M.; Herakovič, N. Automated Generation of Simulation Models and a Digital Twin Framework for Modular Production. *Systems* 2025, 13, 800. <https://doi.org/10.3390/systems13090800>
- Resman, M.; Herakovič, N.; Debevec, M. Integrating Digital Twin Technology to Achieve Higher Operational Efficiency and Sustainability in Manufacturing Systems. *Systems* 2025, 13, 180. <https://doi.org/10.3390/systems13030180>
- Zupan, H.; Herakovič, N.; Žerovnik, J. A Robust Heuristics for the Online Job Shop Scheduling Problem. *Algorithms* 2024, 17, 568. <https://doi.org/10.3390/a17120568>
- Koroglu Y.; Beyazit M.; Kilinceker O.; Demeyer S.; Wotawa F. Towards Improving Automated Testing with GraphWalker. *IEEE International Conference on Software Testing, Verification and Validation Workshops (ICSTW)*, Naples, Italy, 2025, 54-58, doi: [10.1109/ICSTW64639.2025.10962480](https://doi.org/10.1109/ICSTW64639.2025.10962480).



PILOT PROJECT 3 - AUTONOMOUS SHIPPING TECHNOLOGY SUPPORTED BY AI

Journal papers /preprints:

- Vorkapic, A., Pobar, M., & Ivasic-Kos, M. (2024). A computer vision approach to estimate the localized sea state. *Ocean engineering*, 309, 118318. <https://doi.org/10.1016/j.oceaneng.2024.118318>
- Pobar, M. (2024). Object recognition in marine surveillance cameras. *Politehnika*, 8 (1), 42-49. <https://doi.org/10.36978/cte.8.1.4> (open access)
- Vorkapić, A.; Martinčić-Ipšić, S.; Piltaver, R. Interpretable Machine Learning: A Case Study on Predicting Fuel Consumption in VLGC Ship Propulsion. *J. Mar. Sci. Eng.* 2024, 12, 1849. <https://doi.org/10.3390/jmse12101849> (open access)
- Sambolek, S., Ivasic-Kos, M. Person Detection and Geolocation Estimation in Drone Images. *SN COMPUT. SCI.* 6, 358 (2025). <https://doi.org/10.1007/s42979-025-03869-7>, Open access: <https://rdcu.be/eynTB>
- Pobar, M., Paulin, G., Ivasic-Kos, M., & Vorkapic, A. (2025). Automated Real-Time Localized Sea State Estimation During Navigation Based on the Beaufort Scale. *Authorea Preprints*, DOI: [10.1109/OJITS.2025.3650057](https://doi.org/10.1109/OJITS.2025.3650057)
- Ivasic-Kos, M., Palinic, D., Pobar, M. Ensemble of Vision Transformers for Sea State Classification. *TechRxiv*. August 02, 2025., DOI: [10.36227/techrxiv.175416658.81522895/v1](https://doi.org/10.36227/techrxiv.175416658.81522895/v1). *Authorea Preprints*.

Conference proceedings:

- Pobar, M. Vorkapic, A. Ivasic-Kos, M. (2025). Comparative evaluation of specialized deep learning and large multimodal models for image-based sea state recognition on the Beaufort scale, *IWPR - 10th International Workshop on Pattern Recognition*, 13.-15.6.2025, Singapore (in press)
- Pobar, M., *YOLOv7 Model for Small Object Handling in Maritime Images // 34th Central European Conference on Information and Intelligent Systems*., Varadin, 2023. <https://archive.ceciis.foi.hr/public/conferences/2023/Proceedings/IS/IS16.pdf>



ACTION AND INVESTMENT PLAN

Action 1: Creation of a Virtual Site for Maritime Ecosystem Actors;

Action 2: Designing training programmes for maritime ecosystem stakeholders;

Action 3: Cross-Border Maritime R&I Collaborative Projects;

Action 4: Maritime Industry and Academic Exchange Programs;

Action 5: Public Awareness Campaigns on Maritime Sustainability;

Action 6: Innovation Competitions and Hackathons.



The strategy focuses on advancing maritime innovation across shipping, logistics, sustainability, and safety by combining Slovenia's technical expertise with Croatia's strong maritime heritage. It emphasizes active engagement of key stakeholders, including shipping companies, port authorities, research institutions, start ups, and investors, based on ecosystem mapping from WP2. Innovation opportunities are identified with a clear focus on efficiency, sustainability, and global competitiveness, supported by the mobilization of both public and private financial resources and aligned with relevant policy and regulatory frameworks.

INNO2MARE AS A PART OF EXCELLENCE HUB COMMUNITY

Widening Impacts WEBSITE : [Widening Impacts](#)



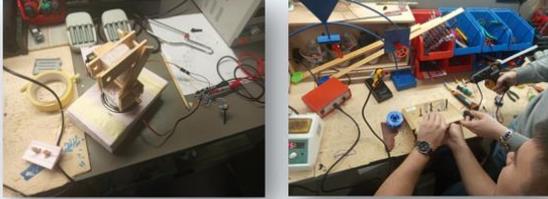
Outcomes:

-  **Joint activities with EH Community members**, including co-hosted events, joint publications, and collaborative pilot initiatives.
-  **Stronger integration of regional R&I ecosystems** by linking maritime innovation actors with wider thematic and cross-sectoral networks across Europe.
-  **Improved capacity building** through shared training programmes, workshops, mentoring activities, and peer-learning exchanges.
-  **Enhanced dissemination and exploitation of project results** by leveraging EH Community communication channels and networks.
-  **Positioning INNO2MARE as a reference model** for cross-border innovation and ecosystem building in widening regions.
-  **Development of joint project proposals** addressing common thematic priorities under Horizon Europe and related EU funding programmes.

Citizen engagement

Citizens' skills development

2 events organized so far, both in Croatia and Slovenia, 34 participants involved



Thematic camps

Partners implemented training programmes for children and youth, focused on maritime related innovation challenges

3 events in Croatia and Slovenia, 62 participants



Citizens Connect, facilitated by the Innovation Council

Partners organized thematic discussions where bottom-up civic participation is sought in tackling key issues related to the two innovation ecosystems 2 events organized so far, in Croatia, 86 participants



Knowledge transfer & staff exchange

Training of ecosystems' actors on demand-driven knowledge transfer

3 events organized so far, in Croatia 73 participants involved



Advisory support on knowledge and technology transfer activities

Partners conducted advisory support sessions on knowledge and technology transfer for various ecosystems' actors, 15 individual sessions organized during RP2, Target: ecosystem actors



Short-term secondments & short-term missions

28 secondments & 9 short-term missions organized during RP2



INNO2MARE Challenge

Partners organized a competition on solving specific problems related to R&I pilot projects in WP3

42 participants in 24 teams



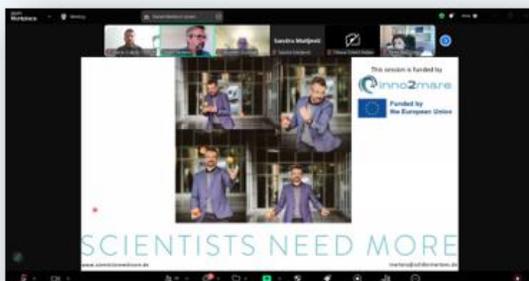
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Entrepreneurship training & smart skills development

Partners organized **trainings** on research & **innovation** management, start-up **entrepreneurship**, business growth and leadership skills

Target: ecosystem actors (existing and aspiring entrepreneurs, scientists,...)

6 trainings
137 participants

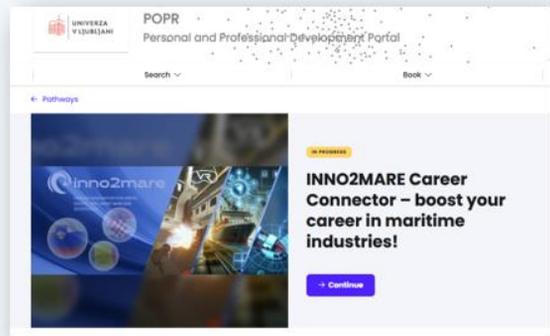


Attraction of talents and career development

- **INNO2MARE Career Connector platform**

Career Connector platform is integrated into the project [website](#).

Target: employers and job seekers in the Slovenian and Croatian ecosystems



- **Bootcamp IT – training programme for junior developers**

Partners organized a **3-month training program for junior developers**, with significant support by industry actors, **20 participants**



Dissemination and communication in numbers

Establishing of INNO2MARE WEBSITE : <https://www.inno2mare.eu/>

Social Media



 Published **158 posts** on LinkedIn, Facebook & X
 Followers: **240** |  Reactions: **1072**

Press & Media Coverage

 **4 press release** distributed to partners and published online
 **41 media mentions** (partner media published press release)

Publications & Promotional Material:

 Published **4 Newsletter / e-Newsletter**
 Published **9 Brochure / e-Brochure**

Promotional Materials

 3 Roll-up
 4 Posters/Banners/Flyer
 5 video and presentation materials

R&I Popularisation Events:

 Participated in **21 events**: Makeathons, Workshops, Trainings, Researchers' Night, Science Festival

Networking Events:

 Organised **3 Meetup & Innovation Breakfast**

Scientific Engagement:

 Participation in **13 scientific & tech conferences**

Scientific Publications:

 Published **14 articles** in SCI journals

Organization of online events & meetings for transfer of best practices:

 Held **9 online events** for sharing best practices

