



Digitalisation roadmap for the maritime industry

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What?

What was the problem/challenge the case/WP has addressed?

WP 4:

How to improve eco efficiencies by use of digital solutions?

- a) For RoRo ships in the Baltic Sea Area
- b) In shipbuilding processes in shipyards









Why?

Why is it relevant from the perspective of the EU, the Green Deal and the environmental targets set for maritime industry?

- Policy agenda-setting
- Promoting and championing eco-efficient policies
- Industry stakeholders can benchmark technology developments
- Researchers may anticipate challenges ahead
- To enable EU to be ahead of the game





How?

How has ECOPRODIGI approached the challenge?

Inter-disciplinary collaboration between consortium members



Which partners were involved?

For the ship operations: DFDS, Island Ferries in Denmark, University of Southern Norway, University of Southern Denmark, Aalborg University, Turku University, Chalmers University of Technology Danish Maritime, Kockum Sonics & Logimatic







The solution/findings?

The future of Ro-Ro and Ro-Pax shipping:

An innovation and policy roadmap for digitalising integrating ship operations

2022

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01. AIS data used

to coordinate the

existing fleet

2023

2024

2025

17. Cargo

condition data

shared across

network

2026

2027

2028

02. Automated mooring systems



06. Onboard sensor & equipment calibration via live video



03. Fuel & cargo data used to audit vessel performance

available



04. Hull & propeller supported by AI



05. Predictive maintenance tools available for engines & systems



on data

execution supported by AI



10. Al-enhanced cameras at terminals & onboard ships



11. Engine & subsystem maintenance



12. Cargo ETA to terminal tracked & shared

supported by AI



cargo stowage system integration



14. Aerial drones 18. Terminal support ships' operations & navigation & stowage berthing

15. Cargo info

shared in real-

time across

16. Contracts

arriving

haulage carriers



19. Vessels assessed & valued based on EEXI & MRV



20. International standards for maritime cyber security



21. Multipurpose

drones stationed

at ports

22. Voyage (noon)

reports replaced by

sensor and satellite

23. Standards for sharing vessel positions across ports



24. IMO mandates cargo weight & dimensions



25. International vessel voyage codes for Ro-Ro vessels



26. Shipowners taxed on their CO2 emissions



27. EU mandates cold ironing at ports for Ro-Ro vessels



28. Remote controlled terminal tugs (un-)load cargo



29. 2nd generation AIS uses satellites



30. Bunker fuel taxed



31. International standards for sensor data logging & exchange







mandate

implemented

The report "Maritime in the 21st Century: The state of play, a brief history, a roadmap, and scenarios" and roadmap visualisations are available on

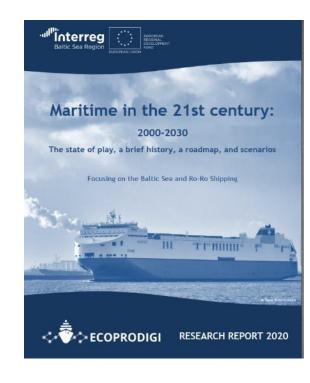
ECOPRODIGI's website:

https://ecoprodigi.eu/publications

www.ecoprodigi.eu







The solution/findings?

Shipyard 4.0 An innovation and policy roadmap for digitalising shipyard operations

2023

2024

2025

05. Biocide-free coating innovations surpass toxic anti-fouling paints

2026

2027

2028

operators

2029

2030

01. Real-time planning tools track progress & report problems



02. Welding quality is digitally monitored in real-time.



03. Al-enhanced documents anticipate forecast, and warn on events

04. Digital databases

improve task training

and handover



06. AR, VR, and 3D simulation used in task training



07. Al systems control and manage warehouse inventory



08.3D Scanning is standardised for ship inspections



09. Aerial drones perform incremental 3D scans at yards



10. Additive manufacturing of spare and missing parts



11. Microgrids supplement yards' electricity needs



12. Autonomous and flexible robots weld in hard-to-reach places



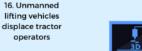
13. Digital twin files are shared across stakeholders



14. Aerial drones perform basic services



15. Digital twins are used for virtual delivery inspections



19. 3D printers are used to print large blocks



20. Composite materials are used for large vessel hulls



17. Digital twins are

used in planning

repairs

18. Warehouse operations performed by automated drones



RESEARCH REPORT 2020

Road to Shipyard 4.0:

The state of play, a brief history of maritime developments, and a future roadmap Focusing on the Baltic Sea and Shipyards

https://ecoprodigi.eu/publications











Relevance?

What is the relevance of the findings / solutions from the perspective of the EU, the Green Deal and the environmental targets set for maritime industry?

- Provides scenarios on possible directions
- Will support policy makers in developing future legislation
- Ship operations and Shipbuilding are industries which we wish to maintain in EU and strengthen going forward
- Projects, research and other initiatives may benefit from building on the scenarios as described.





Thank you!

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