



SMART
MARITIME



SFI SMART MARITIME RESULTS IN NUMBERS

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sfi = Centre for
Research-based
Innovation

The Research Council of Norway

www.smartmaritime.no

DISSEMINATION

64 Peer-reviewed journal articles

19 Conference articles

59 Academic lectures

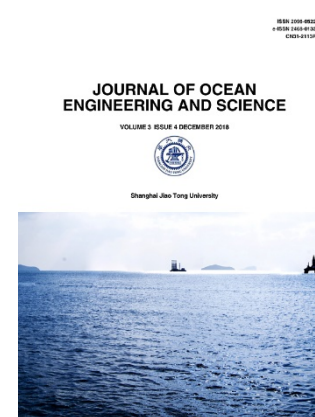
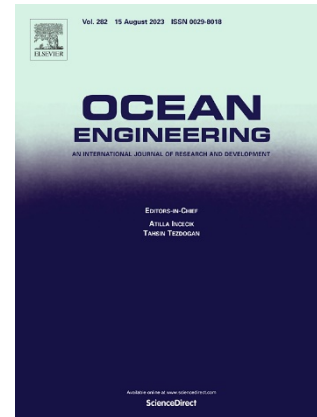
55 Lectures

16 Popular science lectures

12 Popular science articles

20 Public Reports

50 Media contributions



INNOVATION

10 Methods applied by industry

10 New/improved methods completed

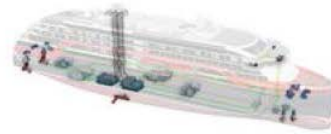
29 Software tools applied or adopted by industry

5 Improved business processes / services

8 New/Improved Product /Technology

6 Test / verification of technology

1 Spin-off



Concept design



Design optimization



Final design

Kongsberg



Flying Foil

Associated projects (1/3)

Project title	Period	Funding	Smart Maritime Partners
HOLISHIP - holistic optimisation of ship design & operation for life cycle	2016-2020	EU H2020	Kongsberg Maritime, DNVGL, SINTEF
Hybrid testing - Real-Time Hybrid Model Testing	2016-2020	MAROFF, KPN	NTNU, SINTEF
SATS - ship performance monitoring in autonomous vessel	2018-2020	MAROFF, KPN	NTNU, SINTEF
Open simulation platform	2018-2020	JIP	DNV, Kongsberg Maritime, SINTEF, NTNU
Digital twin for lifecycle operations	2018-2022	MAROFF	DNV, Kongsberg Maritime, SINTEF, NTNU
CLIMMS - Climate change mitigation in the maritime sector	2019-2023	MAROFF, KPN	NTNU, SINTEF, Rederiforbund + all 8 ship owners
SmartShipRouting	2019-2021	MAROFF, IPN	NCS, NES, Havila, Havyard, SINTEF
RuteSim : Simuleringsbasert Ruteplanlegging	2019-2020	MAROFF, IPN	Grieg Star, WWO, KGJS, SINTEF, Nansen
Digital twin yard	2019-2021	MAROFF, IPN	DNVGL, Rolls-Royce, NTNU, SINTEF
FreeCO2ast	2019-2022	PILOT E	Havyard, Havila, SINTEF
Extension of Hybrid Lab	2019-2019	ABB	ABB, SINTEF

Associated projects (2/3)

Project title	Period	Funding	Smart Maritime Partners
Autoship	2019-2022	EU H2020	Kongsberg, SINTEF
RedRes - Innovative surface structures to reduce friction	2020-2023	MAROFF, KPN	JOTUN, SINTEF, NTNTU, Grieg Star
IPIRIS - Improving Performance in Real Sea	2020-2023	MAROFF, KPN	VARD, Havyard, Kongsberg, SINTEF, NTNU
CruiseZero – Zero-emission expedition cruise	2020-2022	MAROFF, IPN	VARD, ABB, SINTEF
PEZOS - Plug-In Electric Zero-emission Offshore-ship	2020-2022	MAROFF, IPN	VARD, SINTEF
Bio4-7seas - Biofuels in deep sea shipping for climate change mitigation	2020-2023	ENERGIX, KPN	NTNU, SINTEF
ZeroCoaster - Zero-emission coastal bulk shipping	2020-2022	MAROFF, IPN	VARD, ABB, DNV GL, SINTEF
Air-lubrication	2020-2022	MAROFF, IPN	Jotun, SINTEF
Gaters – Gate Rudders	2020-2022	EU H2020	Strathclyde, SINTEF
Aegis	2020-2023	EU H2020	SINTEF
VesselAI	2021-2024	EU H2020	Kongsberg, SINTEF
CCShip – Carbon Capture and Storage onboard ships	2021-2024	MAROFF, KSP	Klaveness, Wärtsila, SINTEF, NTNU
AMAZE - Ammonia zero emission	2021-2023	MAROFF, IPN	Bergen Engines, SINTEF, NTNU

Associated projects (3/3)

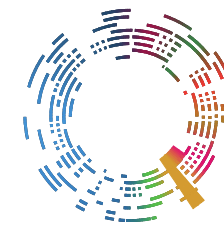
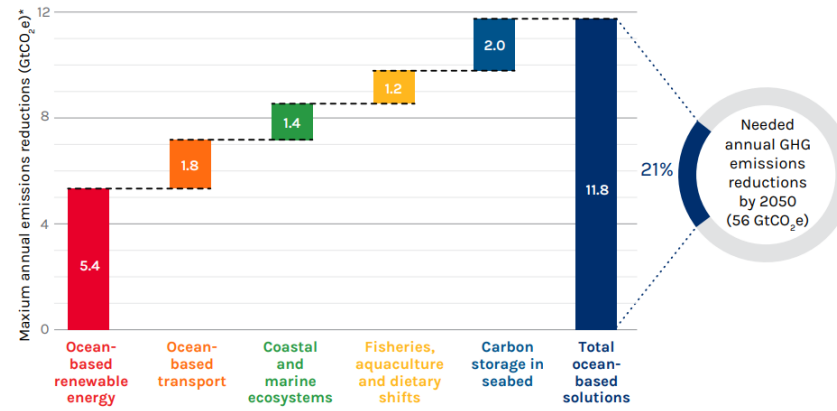
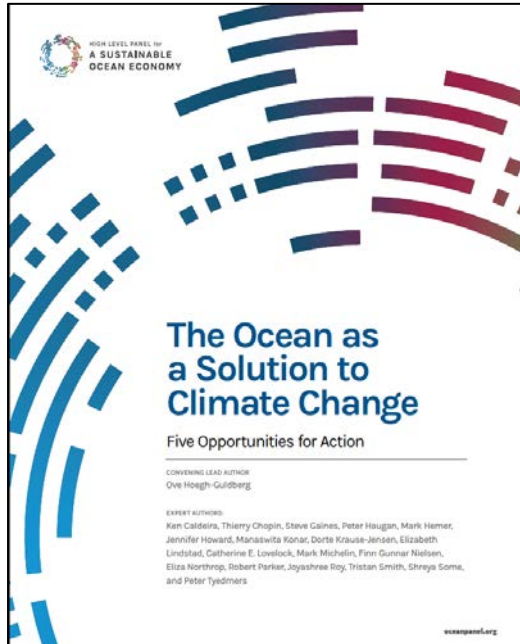
Project title	Period	Funding	Smart Maritime Partners
SEA-Co - Safer, easier and accurate Co-simulations	2021-2025	MAROFF, KSP	DNV, Kongsberg, SINTEF, NTNU
ISTS - Intelligent ship transport systems	2021-2024	MAROFF, KSP	SINTEF, Kongsberg, DNV, Grieg, Kystverket, Sjøfartsdirektoratet
ZeroKyst – Decarbonization of ships for seafood sector	2021-2024	Green Platform	Siemens, SINTEF, NTNU
ProfSea – Ship Operational Performance in Following Sea	2021-2024	NFR, KSP	Kongsberg, SINTEF, NTNU
Ecorouter – Route optimization integrating low-carbon technologies	2022-2024	NFR, IPN	KGJS, Odfjell, OSM Bergen, SINTEF
SeaWorthy	2022-2026	HAV KSP	SINTEF, NTNU, DNV, HAV, Kongsberg, Kystrederiene, Rederiforbundet.
GreenPlatform SeaZero (Hurtigruten)	2023-2026	NFR,IN,SIVA	Vard, DNV, Jotun, SINTEF
WIND - Enabling Zero-Emission shipping with wind-assisted propulsion	2023-2026	NFR, KSP	Kongsberg M, KGJS, Grieg Star, Odfjell, Klaveness, Solvang, NTNU, SINTEF
OPTISTRESS – system optimization and stress-testing in co-simulations	2023-2026	NFR, KSP	HAV Design, NES, DNV, NTNU, SINTEF
Air Lubrication for ocean-going vessels	2023-2026	NFR, KSP	Kongsberg, Jotun, KGJS, Klaveness, Grieg Star, NTNU, SINTEF

Strategic impact

- Leading working groups in both Martim21 iterations
- Board member in EU public private partnership for Waterborne Transport
- Providing feedback on several government propositions and strategy documents (e.g. Maritim stortingsmelding, Regjeringens strategi for grønn skipsfart)



HLPOCC: High Level Panel for A Sustainable Ocean Economy



HIGH LEVEL PANEL for
**A SUSTAINABLE
OCEAN ECONOMY**

2019

Chief Scientist E. Lindstad invited to co-author the HLPOCC report together with 18 international scientific experts.

Report delivered by former Prime Minister Erna Solberg to UN General Secretary on UN Climate Summit September 2019

2023

Re-invited to co-author the updated HLPOCC report.

2 SINTEF employees on the authors list: Lindstad and Gamlem

IMO's adoption of guidelines on life cycle GHG intensity of marine fuels

The collage includes the following documents:

- SMART MARITIME:** "Fuels and engine technologies with focus on GHG and Energy utilization" (2020).
- IMO:** "MEPC 80/1/1" (2023) and "MEPC 80/1/11" (2023) resolutions regarding GHG emissions from ships.
- Articles:** "Decarbonizing Maritime Transport: The Importance of Engine Technology and Regulations for LNG to Serve as a Transition Fuel" (2021) and "Assessment of Alternative Fuels and Engine Technologies to Reduce GHG" (2021).
- Reports:** "Life Cycle GHG Emission Study on the Use of LNG as Marine Fuel" (2019) and "Transportation Research Part D: Reduction of maritime GHG emissions and the potential role of E-fuels" (2021).
- Other:** "Register of Commission Expert Groups and Other Entities" and "European Sustainable Shipping Forum (ESSF)".

2019
Questioning
 Thinkstep (2019)
 LCA report on marine fuels.

2020
Smart Maritime
WP1 Report on Fuels & engine technologies with focus on GHG and energy utilization

2020-2023
 Smart Maritime key contribution to **European Sustainable Shipping Forum – Proposal for Methodology** to calculate the life cycle WTW GHG emissions of marine fuels

2021- 2022
 Smart Maritime / SINTEF Publications on WTW LCA of Marine Fuels + Continuous dialog with EC ESSF, IMO Correspondance Group on Marine Fuel Life Cycle GHG Analysis.

2021 - 2023
 Smart Maritime / SINTEF contribution to dialog on LCA Guidelines at IMO's Intersessional Working Group on Reduction of GHG Emissions from Ships. MEPCs 76-77-78-79

MEPC80: Adoption of Final Draft LCA Guidelines