



Introduction to the Fleet Decarbonization Optimizer



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for Zero Carbon Shipping

The maritime industry is facing an unprecedented challenge...

The ambition to decarbonize the maritime industry by 2050 calls for immediate action. The pressure from industry stakeholders is increasing but the maritime industry still faces a lot of uncertainty and unanswered questions when it comes to decarbonization. The uncertainty is created by:



Uncertainty on technological developments



Uncertainty on Fuel cost and fuel availability



Uncertainty on regulation and lack of global standards



Limited visibility on timelines

A narrow, short-termed and single-minded view on the future could leave shipowners with high-cost positions or even a risk of stranded assets.

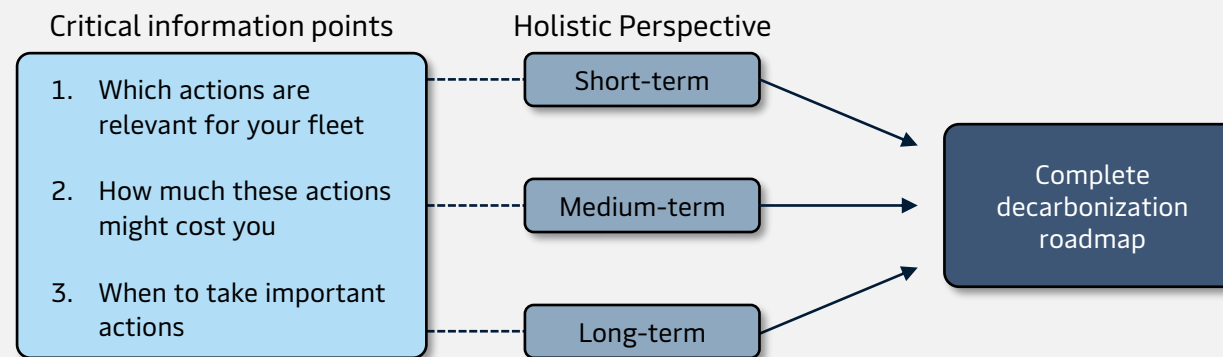
To best navigate in an uncertain future, a holistic decarbonization roadmap should have an answer on:

1. **Which actions** are relevant for my fleet in the long term and which actions are necessary to take now to initiate the decarbonization?
2. **What is the cost of these actions** and what is the cost of not acting?
3. **When will these actions** be relevant for me to consider?

The Fleet Decarbonization Optimizer helps companies find cost-optimal pathways to decarbonize their fleet

- The Fleet Decarbonization Optimizer (FDO) leverages calculations on total cost of ownership (TCO) and simulates **the most cost-optimal pathway** to decarbonize a fleet.
- The Fleet Decarbonization Optimizer is a data-based optimization tool. Rather than being a plug-and-play piece of software it is a **bespoke tool** that allows for scenario-based outputs and incorporates the necessary data to cope with technology-, fuel- and regulatory uncertainties in the market.
- The FDO aims to **de-risk decision-making** by providing detailed information on necessary actions and their cost and effect, insights that are crucial for every investment decision.
- It contains the best-available decarbonization data gathered through collaboration across centers of expertise including the Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping, Maersk Broker Advisory Services and McKinsey & Company.

Taking a holistic view on your decarbonisation journey including both short-, medium- and long-term initiatives will make the overall transition most cost-effective



A partnership to support your decarbonization journey

The FDO is co-developed by a unique partnership



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MMMCZCS is a not-for-profit, independent, research- and development center working with industry players across the energy- and shipping sectors to mature viable decarbonization pathways for shipping globally.

Cross-value chain collaboration of 19 strategic partners and 7 knowledge partners.

Focused on accelerating marine industry decarbonization through R&D programs, thought leadership and targeted advocacy.

Maersk Broker Advisory Services (MBAS) is a maritime boutique-style consulting department that provides innovative and tailored capital and consultancy solutions to a broad range of stakeholders in the maritime sector.

MBAS draws on a wealth of maritime data, knowledge, experience and network developed by 100+ years of experience in the shipping industry.

MBAS aims to leverage its special position of being part of the first shipbroking company that has joined the Getting to Zero Coalition to assist all stakeholders in the industry to decarbonize.

McKinsey & Company is a leading global management consultancy with >30,000 employees and 130 offices in 65 countries.

Extensive experience and deep expertise in the shipping industry through serving the leading shipowners / operators worldwide on strategically important topics.

Knowledge partner to the Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping.

A cost-effective decarbonization strategy centered on data

The Fleet Decarbonization Optimizer is built on key data from the maritime industry

The Fleet Decarbonization Optimizer is a first-of-its-kind bespoke tool to model TCO pathways for zero-carbon shipping

The FDO is a data-based optimization tool that assists industry stakeholders in determining how to decarbonize fleets in the most cost-optimal way. It is an industry-informed model that includes the best-available decarbonization data including:



130+ parameters on vessel configurations

Incl. type of vessel, routes, fuel type, engine technology, time horizon



50+ parameters on fuel supply

Incl. granular breakdown of production cost into every part of value chain



10+ parameters on emissions across fuels

Incl. an understanding of difference between well-to-tank and tank-to-wake



100+ TCO parameters

Incl. CAPEX, OPEX, Cost of capital, engine/vessel efficiency, and maintenance and opportunity cost.

The output from the tool is the best starting point to develop or refine a decarbonization strategy

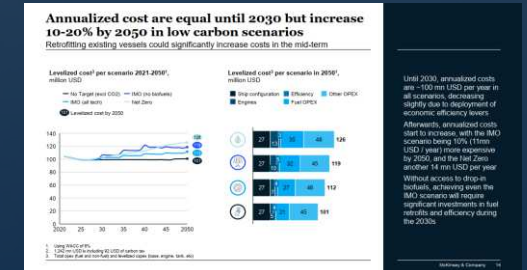
Report

- TCO cost comparisons for all vessel types / size groups in the fleet
- Sensitivities around assumptions influencing TCO
- Detailed schedule of suggested retrofits and newbuilds
- Financial implications (capital outlay, return ratios)
- Emissions trajectory based on your chosen optimization criteria

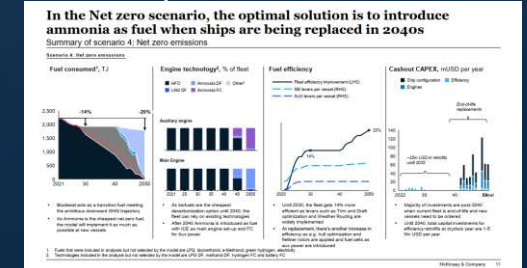
Read-out

Workshop with maritime and decarbonization experts from McKinsey, MBAS and Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping

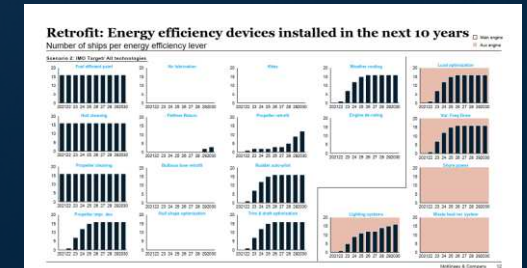
Fleet-specific TCO comparisons¹



Fuel consumption breakdown²



Detailed fleet retrofit and NB schedule³





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