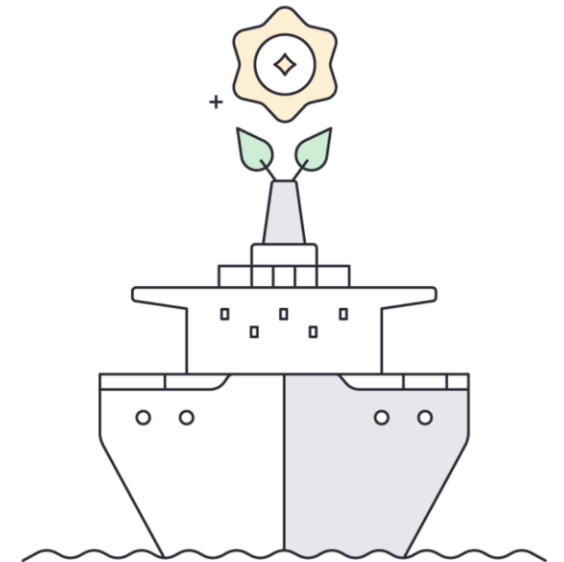




Mærsk Mc-Kinney Møller Center
for Zero Carbon Shipping

Towards a net-zero future for the
maritime sector



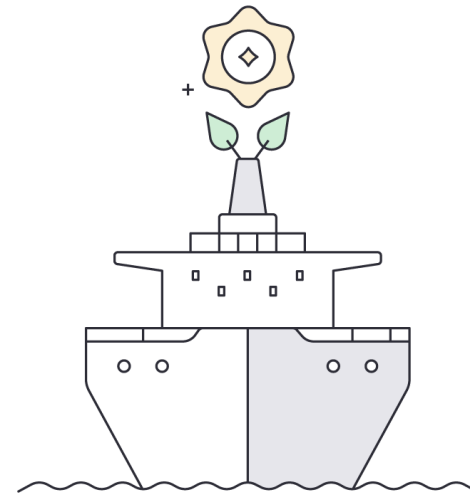
The Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping - we show the world it is possible

Our vision

A decarbonization of the global maritime industry by 2050

Our mission

To be a visible and significant driving force in the global maritime decarbonization journey



Our approach

Not-for-profit

Money earned by or donated to the Center is used in pursuing our mission.

Independent

We operate in a pre-competitive environment bringing together key players across the value chain.

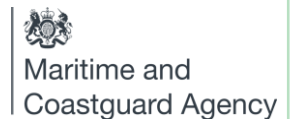
Science-based

We explore viable decarbonization pathways by assessing available data and developing our own energy and technology solutions.

Our Partners share the zero-carbon vision and are committed to collaborative climate action

Strategic Partners

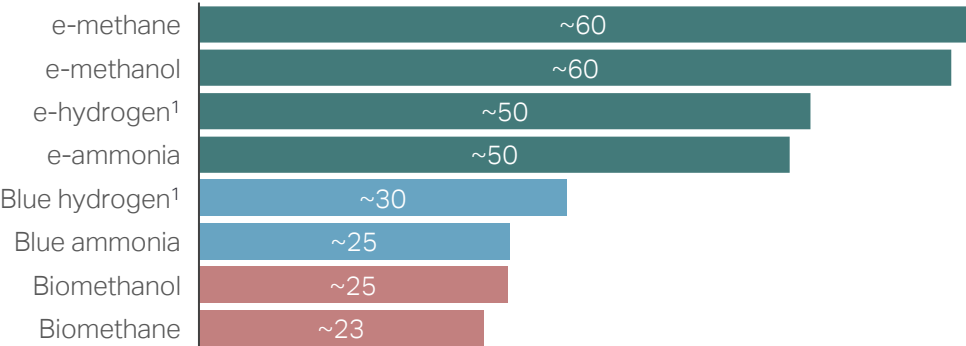
Knowledge Partners



With low prices and already established supply chains, fossil fuels are tough competitors to beat

Production costs of alternative fuels ~2-8x of fossil fuel prices

Estimated globalized production costs, 2025
USD/GJ

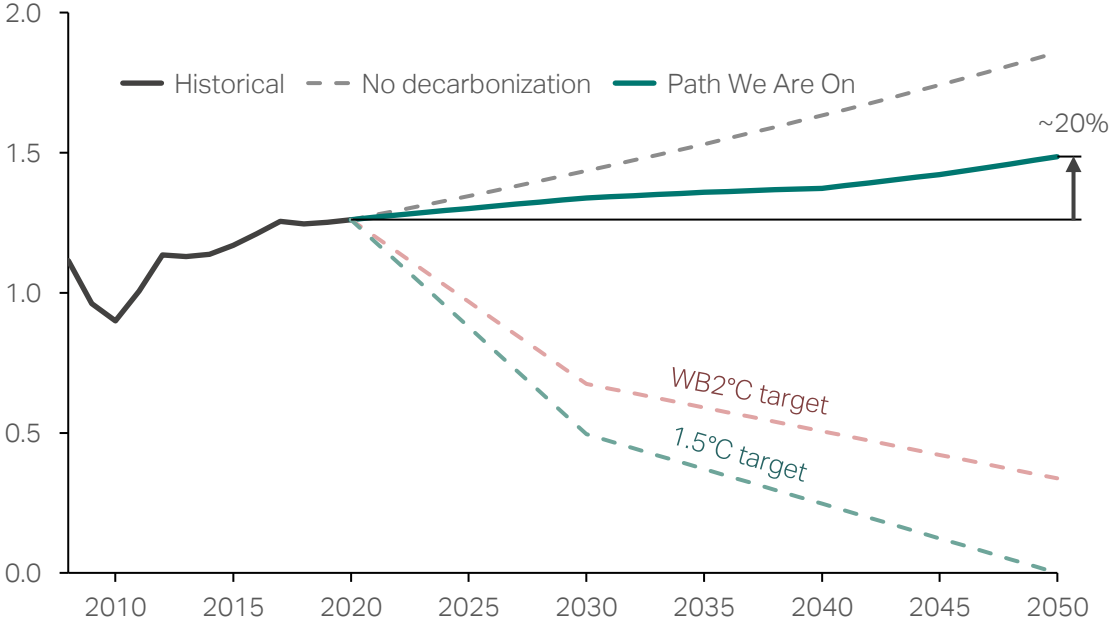


Estimated globalized price, 2025
USD/GJ



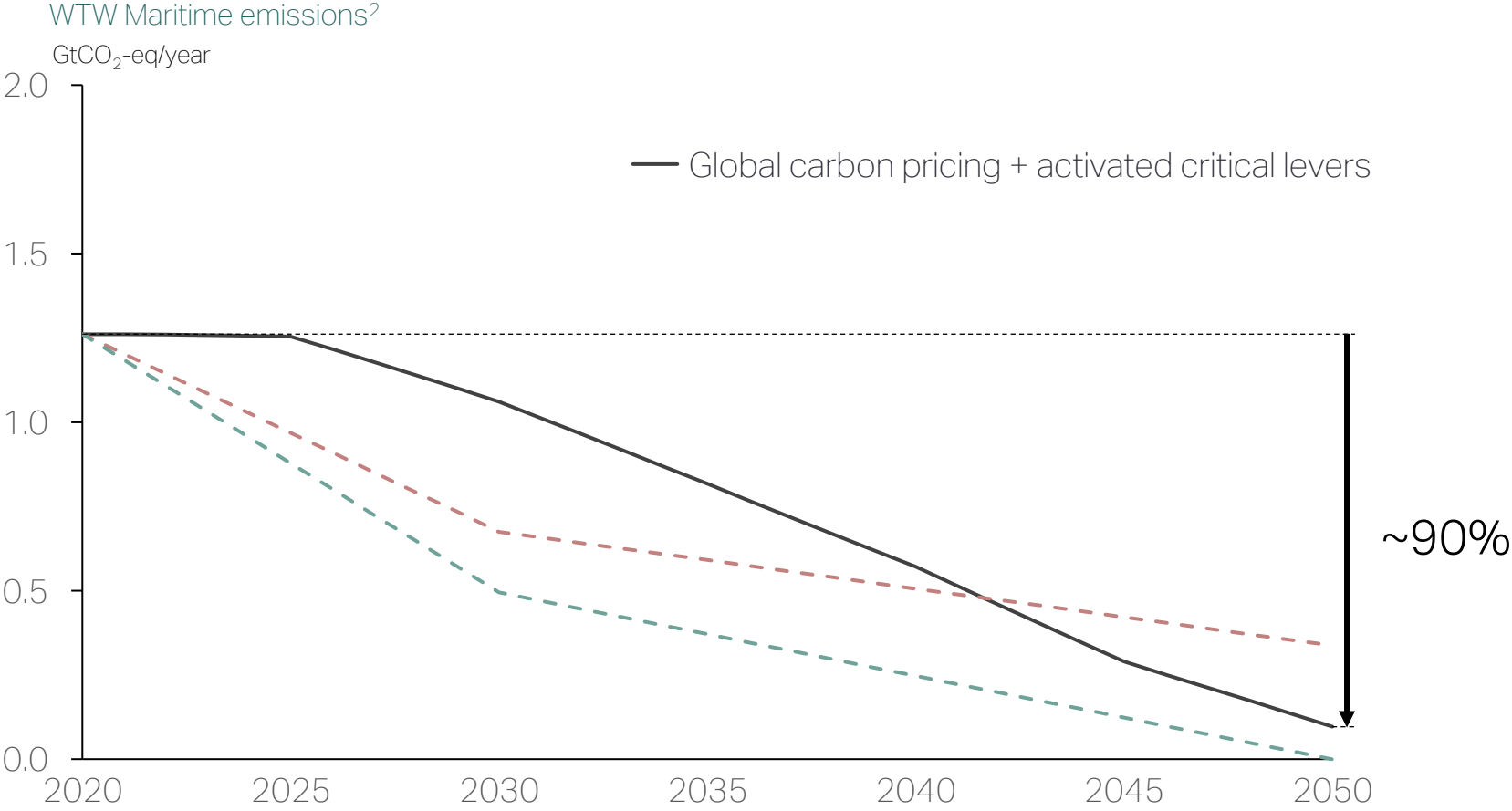
The path we are on leads to increased GHG emissions

WTW Maritime emissions²
GtCO₂-eq/year








Source: : IMO, IEA, Clarkson's, NavigaTE Techno-economic model MMM Center for Zero Carbon Shipping
 1 Liquefaction of hydrogen is considered; Bio-oils are only commercially available after 2025.
 Note: Actual fuel prices will be subject to various external factors including but not limited to supply/demand imbalances, local carbon pricing initiatives and subsidies.
 2 WTW = well to wake

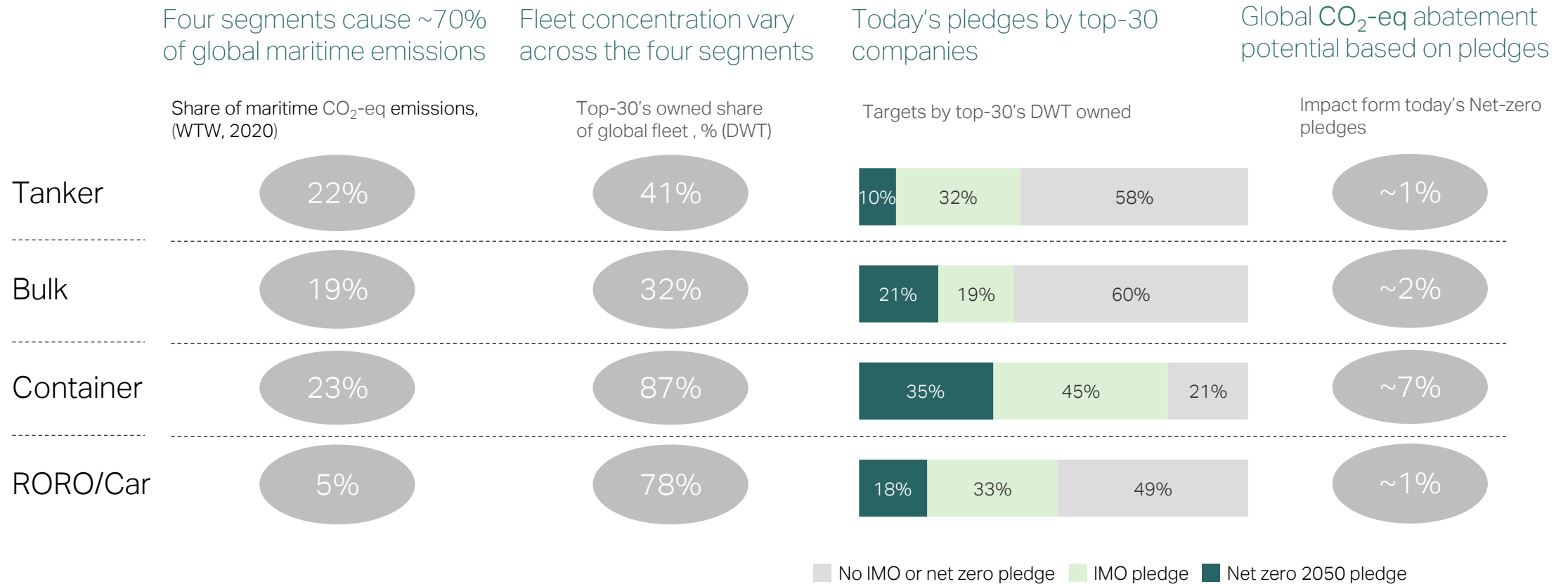
Zero is possible! But it requires motivation, innovation, investments at scale, and regulatory measures



Levers that will work in concert

-  Policy and regulation
-  Tech advancements on ship
-  Energy & fuel advancements
-  Customer demand/pull
-  Finance sector mobilization

Net zero pledges are important to drive the transition, and may give significant abatement impact if made explicit and followed



Fully ready ? What are the barriers and where are the bottlenecks preventing impactful transition take-off

Draft under review

	Feedstock availability	Fuel production	Fuel storage, logistics and bunkering	Onboard energy storage & fuel conversion	Onboard safety and fuel management	Vessel emissions	Regulation
E-ammonia							
Blue ammonia							
E-methanol							
Bio-methanol							
E-methane							
Bio-methane							
Bio-oils							

The systemic maturity map will present a simple, interactive overview of the readiness for solutions in the entire value chain

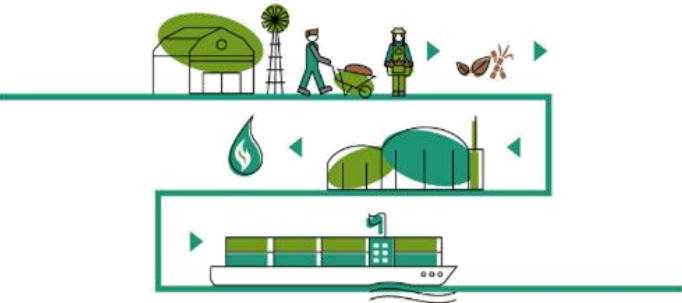
For more details on the map, go visit: www.zeroarbonshipping.com

-  **MATURE AND PROVEN**
Technology is mature and proven and is at or close to commercial scale. Only minor challenges outstanding.
-  **SOLUTIONS IDENTIFIED**
Technology/solutions identified or exist, but availability/scale not mature and proven in actual applications.
-  **MAJOR CHALLENGES REMAIN**
Major challenges remaining / no clear solution identified / specification not in place

Industry first-movers are leading the way, but fast followers equally need to be incentivized and supported to unlock the transition

CMA CGM & biomethane

CMA CGM launches the first low-carbon shipping offer by choosing biomethane



NYK and ammonia

NYK: Project to commercialize ammonia-fueled ships set to begin



Maersk and methanol

“Designing the future of our customers’ supply chains with carbon-neutral methanol vessels” 15 kTEU container vessels



Thank you

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