

# Green Ship Technology: **What could fuel shipping by 2030 and 2050 and what might the ship look like?**

**Jacob Sterling**  
Head of Technical Innovation  
A.P. Moller – Maersk A/S





# A.P. Moller – Maersk at a glance

**Present in**  
**130+**  
Countries

**Revenues<sup>1</sup> of**  
**38,890**  
USD million

**Profits<sup>1</sup>**  
**509**  
USD million

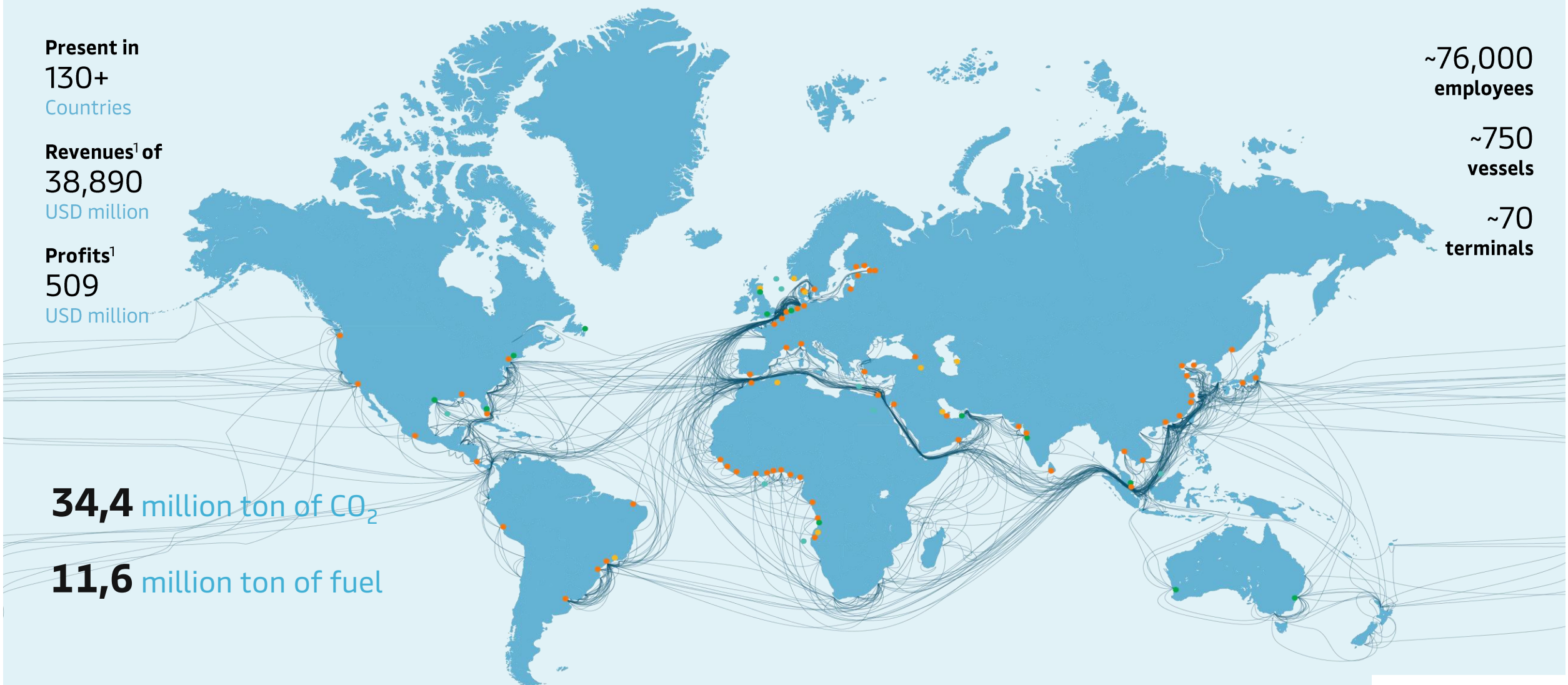
**~76,000**  
employees

**~750**  
vessels

**~70**  
terminals

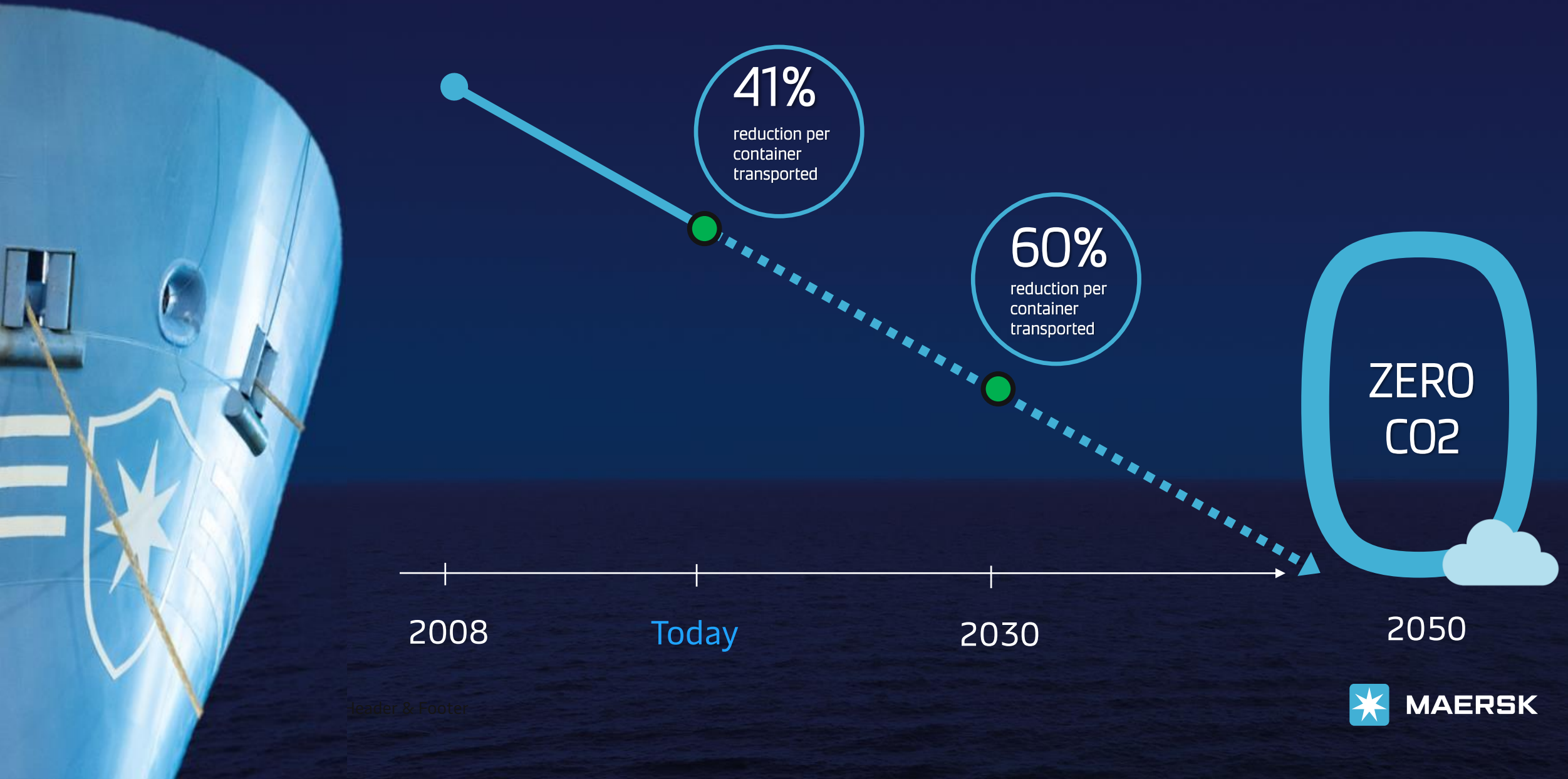
**34,4** million ton of CO<sub>2</sub>

**11,6** million ton of fuel



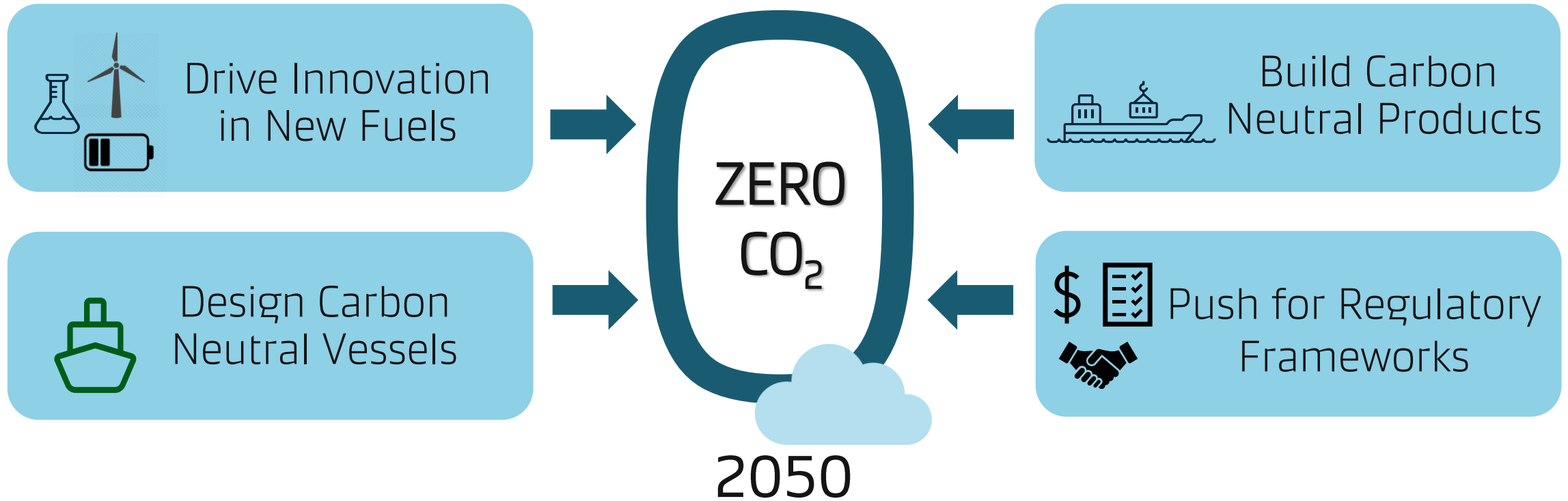
1. FY 2019

Maersk has committed to NET-ZERO CO2 EMISSIONS by 2050...

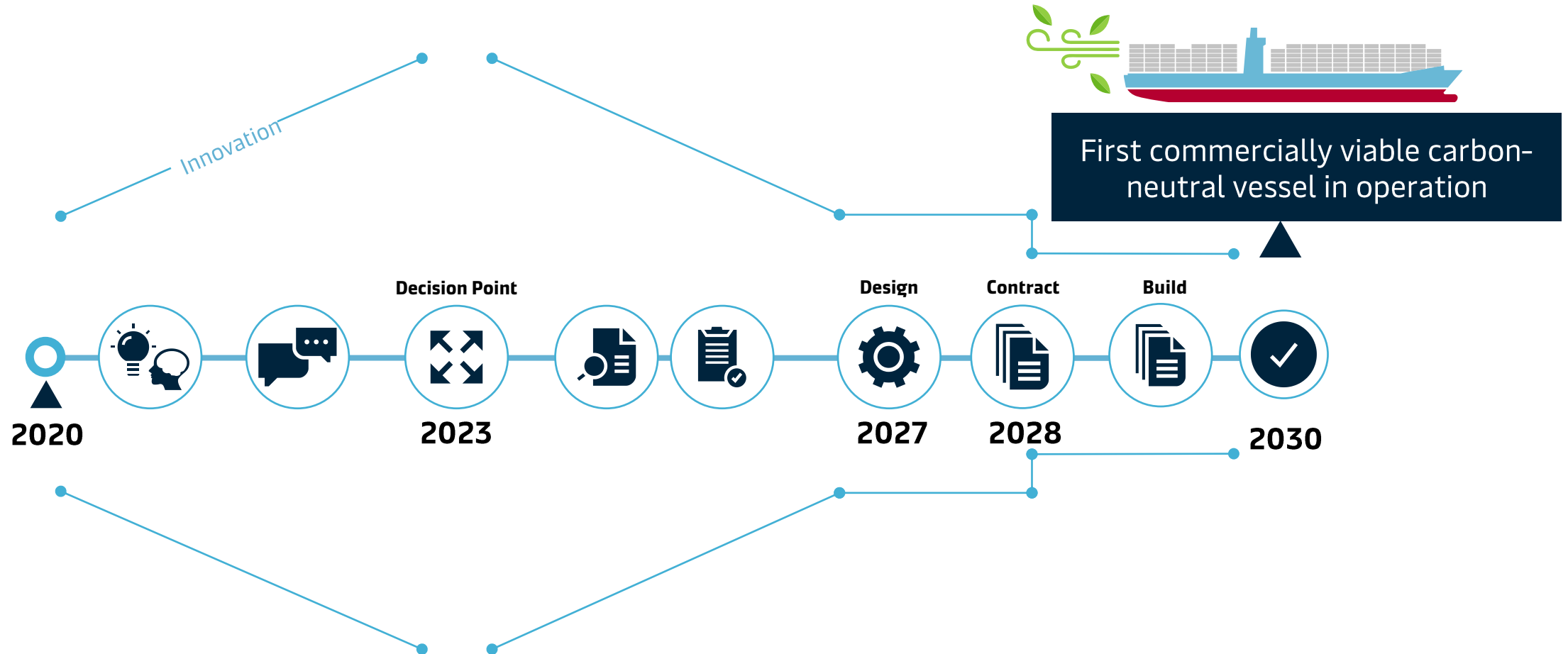


... and broad-based action is urgently needed to reach this goal

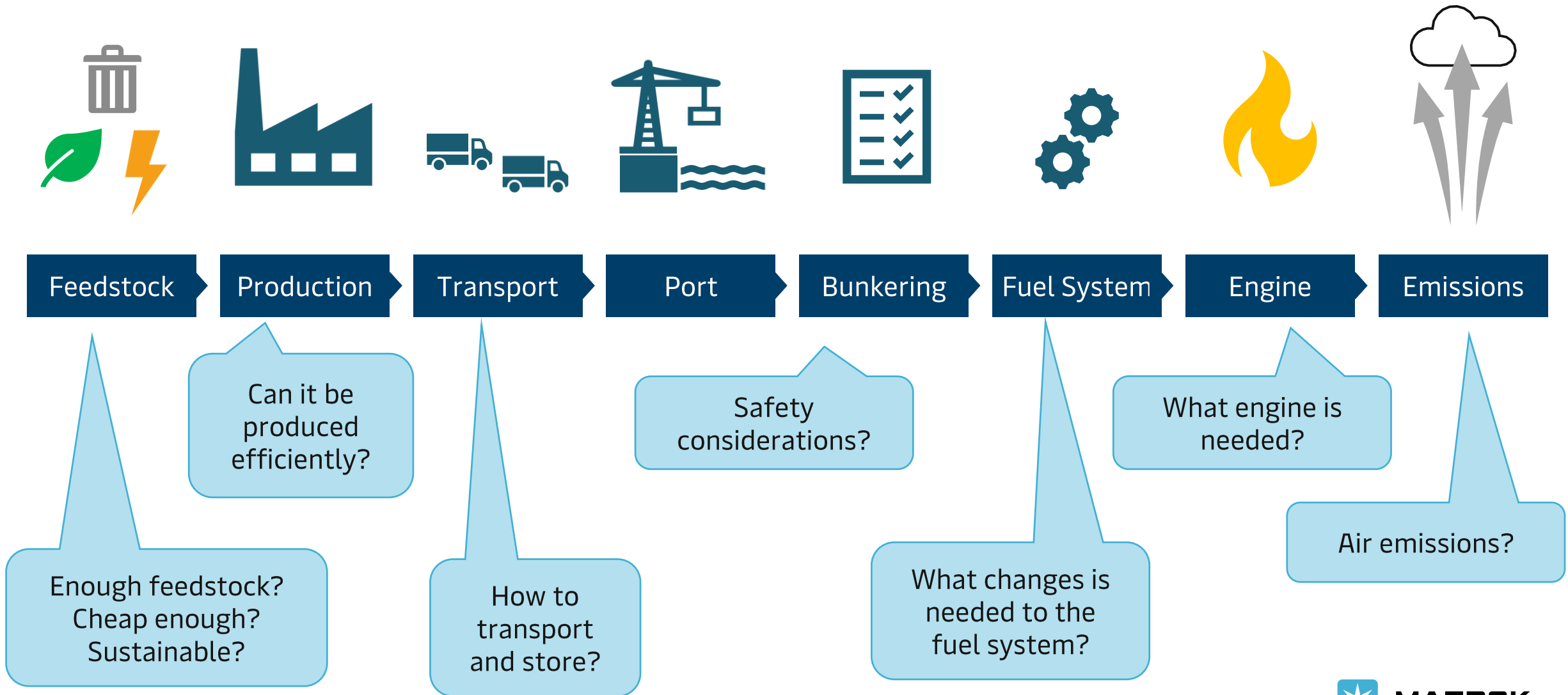
## Maersk initiatives



# Our plan is to have our first carbon neutral container vessel by 2030



# Finding the fuels of the future will be cumbersome!



# Getting to zero CO2 requires new fuel(s) for shipping

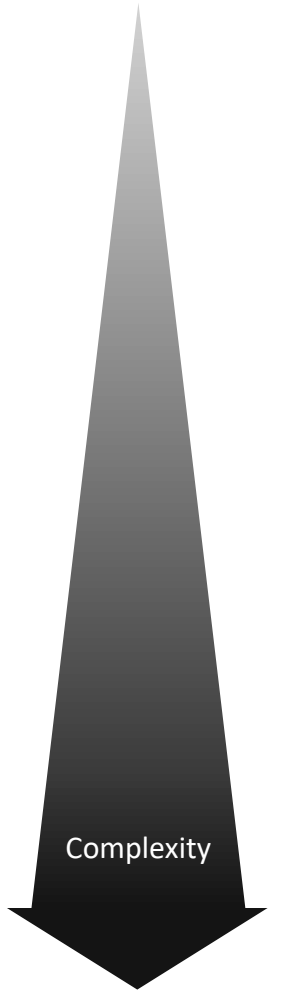


Energy Carrier  
Characteristics

Energy Carriers

Vessel Characteristics

Drop-In/ Blend-in fuels					Minimal changes to engine/systems			
Low flash point fuels						Liquid-Gas Engine, Low-flash system, structural tanks, and possible pilot fuel		
Non-cryogenic gas					Gas Engine, Liquid Gas Tanks (non-cryogenic), FGSS			
Cryogenic gas					Gas Engine, Liquid Gas Tanks (cryogenic), FGSS			
Battery / Hybrid Propulsion		Battery Pack 				Electric Propulsion, Battery Packs		
Nuclear & Unknown	X	Thorium 	Unknown X				Nuclear Reactor and other unknown	
Fuel Cell	X							Fuel cell, electric propulsion



Complexity

# Concluding remarks

- Shipping needs to decarbonise – like everyone else!
- No solutions will be easy or simple – so we better get started now, so that we can learn before we scale.
- We cannot expect business as usual – the future fuels will differ significant from what we have today, so we need to adapt.
- We believe that **alcohols**, **bio-methane** and **ammonia** holds the highest potential. We expect more than one winner.
- The shipping “ecosystem” must work together to develop the fuels, ships and infrastructure of the future.



Thank you.