WHEN TRUST MATTERS

Maritime Forecast to 2050

Subgrupo de Trabalho nº 05 da Resolução CNPE nº 10/2024
DNV – Energy Systems & Maritime

About DNV

A global assurance and risk management company

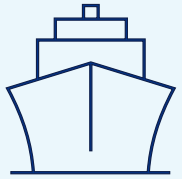
~15,000
employees

100,000+
customers

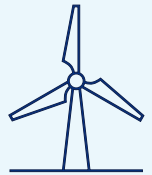
100+
countries

5%+
of revenue to R&D

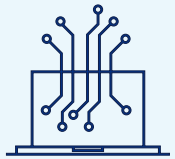
Ship and offshore classification and advisory



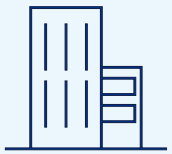
Energy advisory, certification, verification, inspection and monitoring



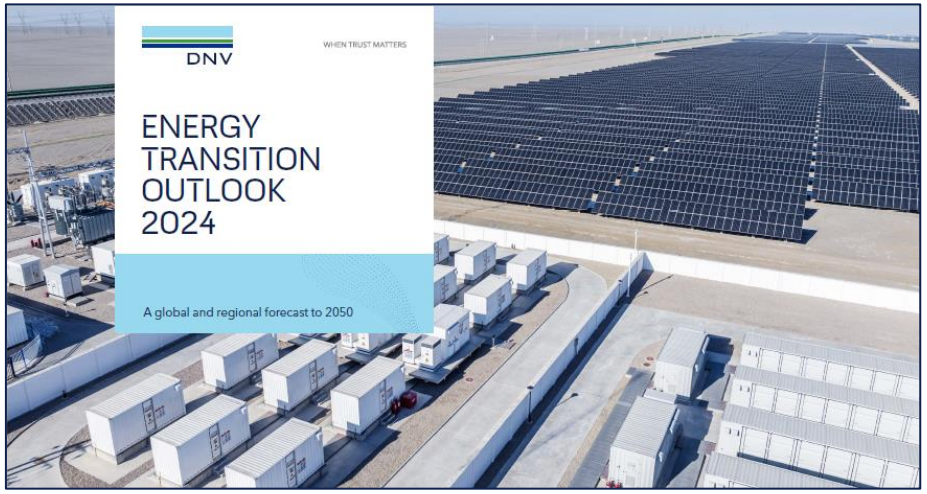
Software, cyber security, platforms and digital solutions

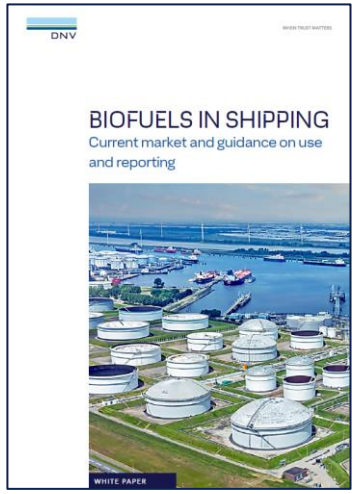


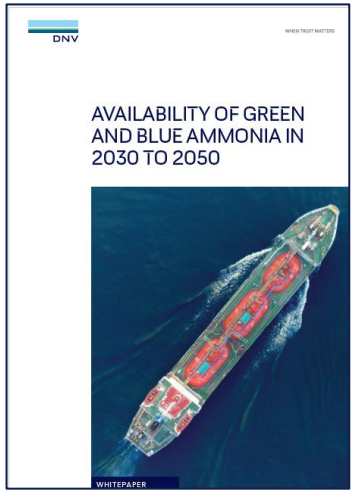
Management system certification, supply chain and product assurance

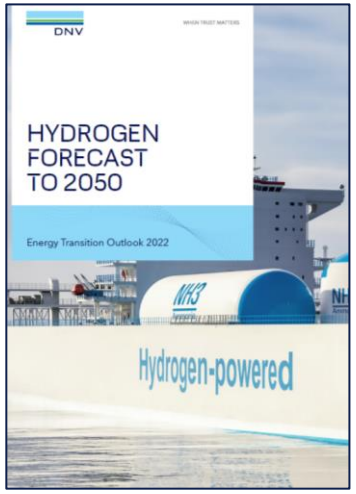


Some papers and publications



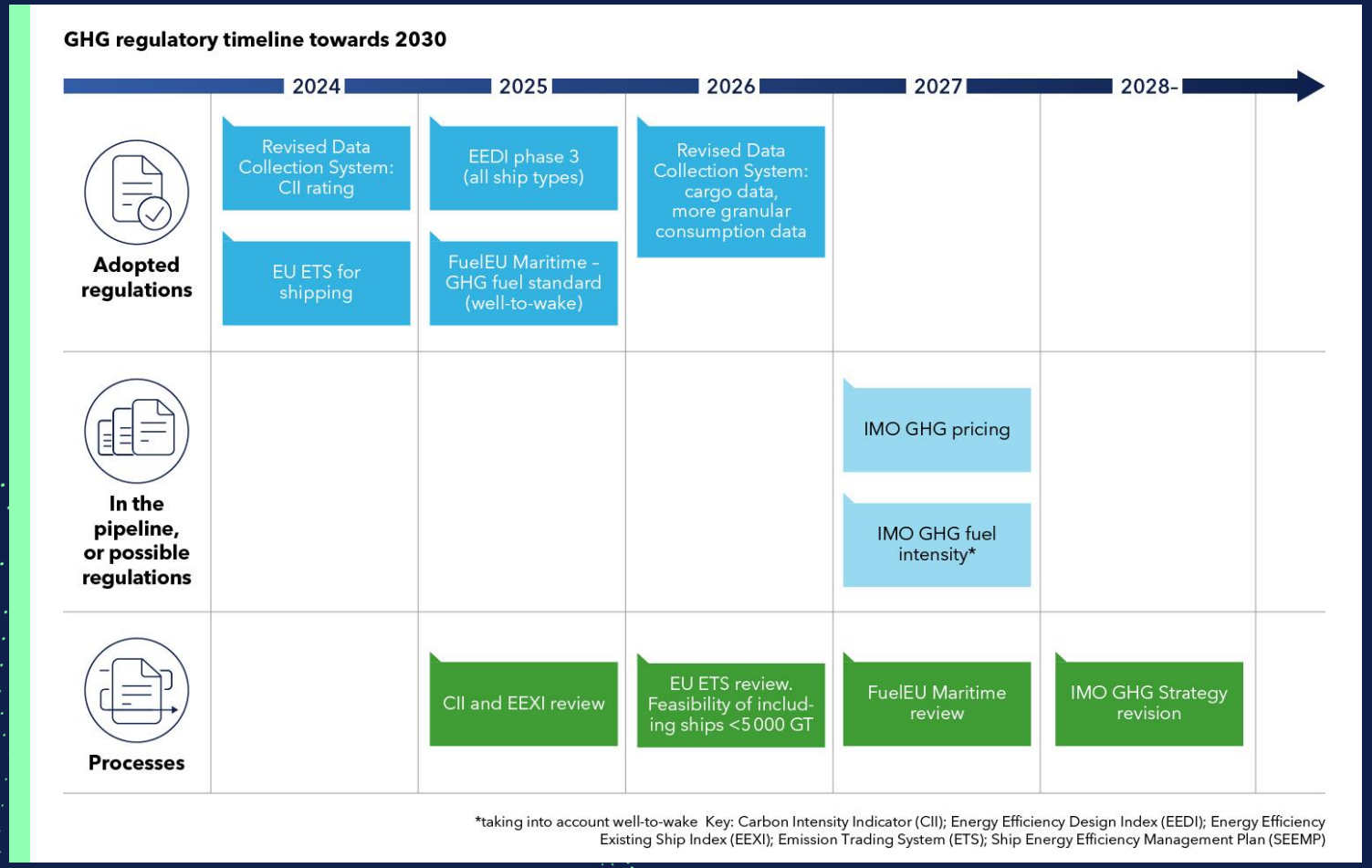






Maritime Forecast to 2050

Regulations are being implemented, and more are on the way



EU ETS from 2024

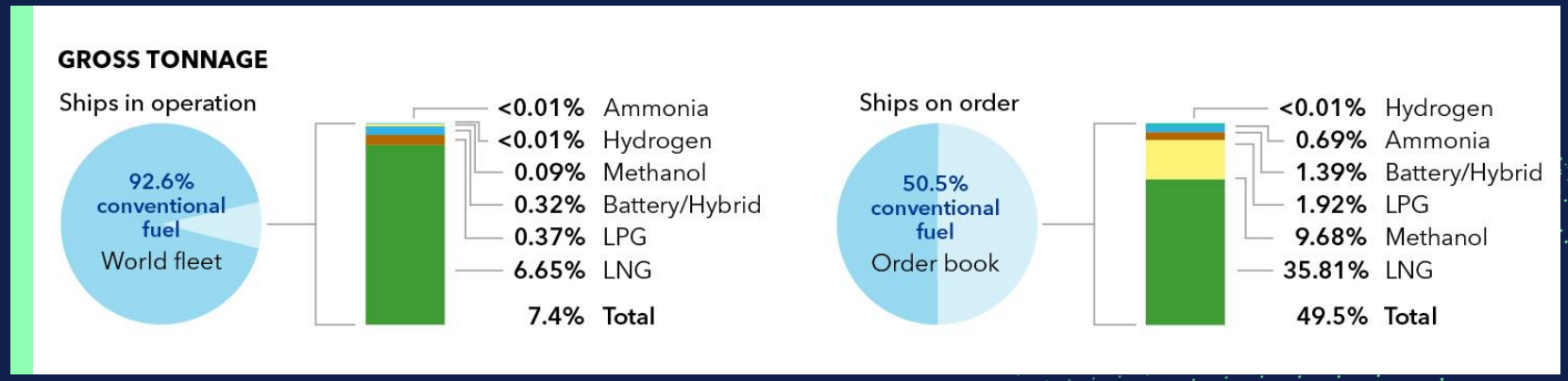
FuelEU Maritime from 2025

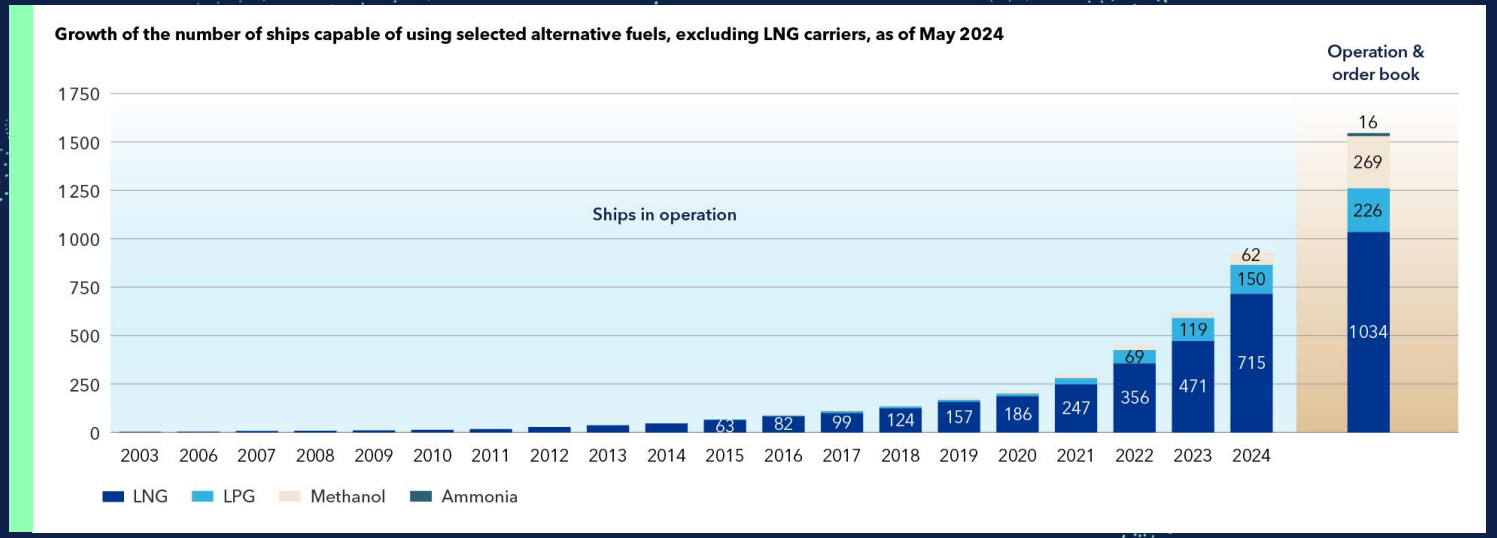
- GHG fuel intensity requirement (gCO_2eq)/MJ)
- Pooling of compliance

IMO basket of measures

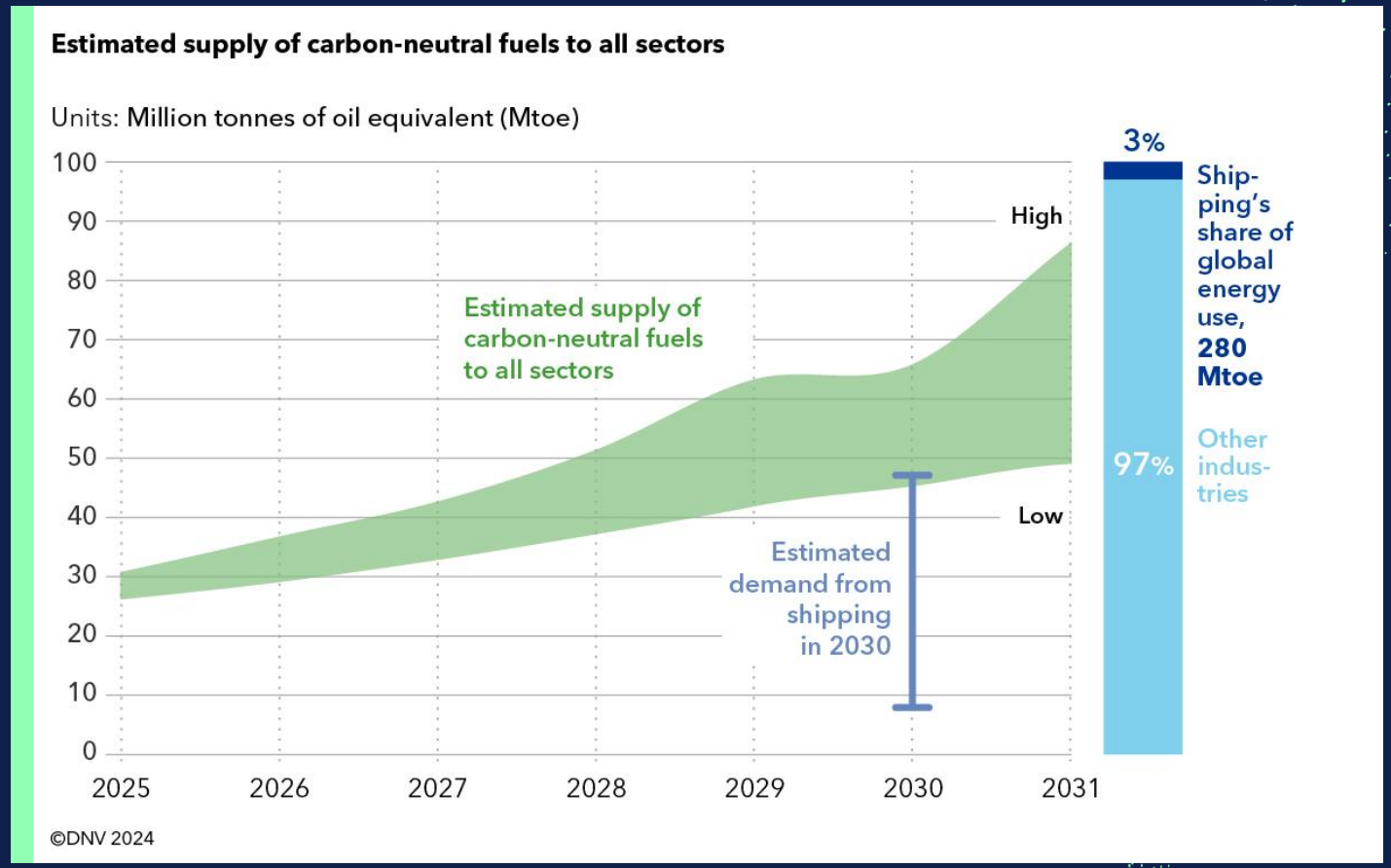
- Technical element: mandate on reduced GHG fuel intensity
- Economic element: GHG pricing mechanism

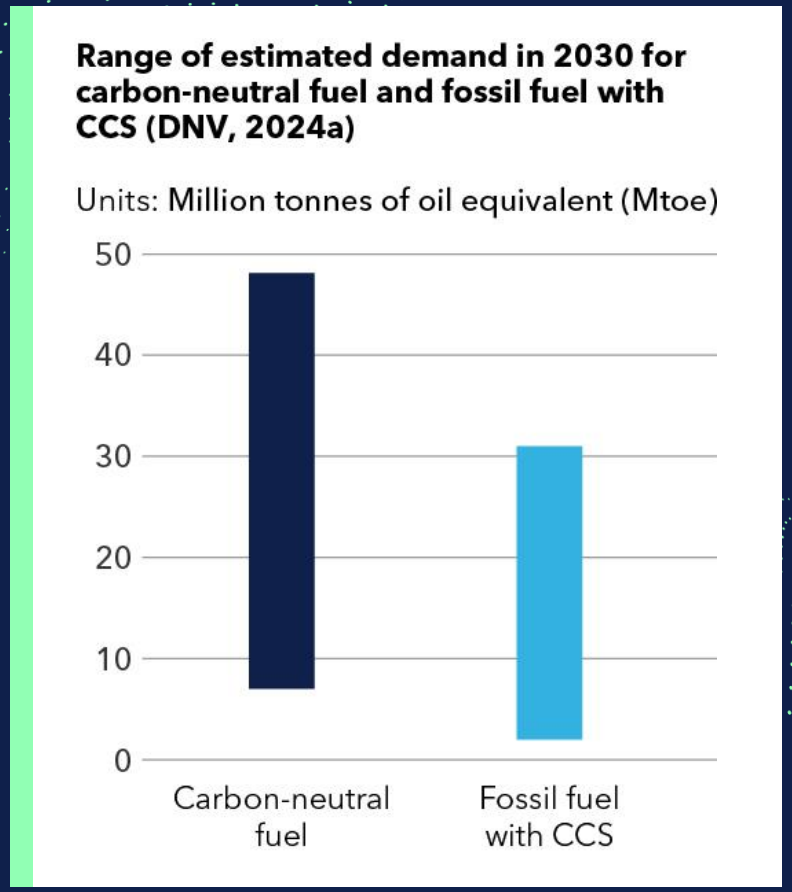
Fuel technology transition progressing – half the ordered tonnage on LNG, LPG or methanol in dual-fuel engines



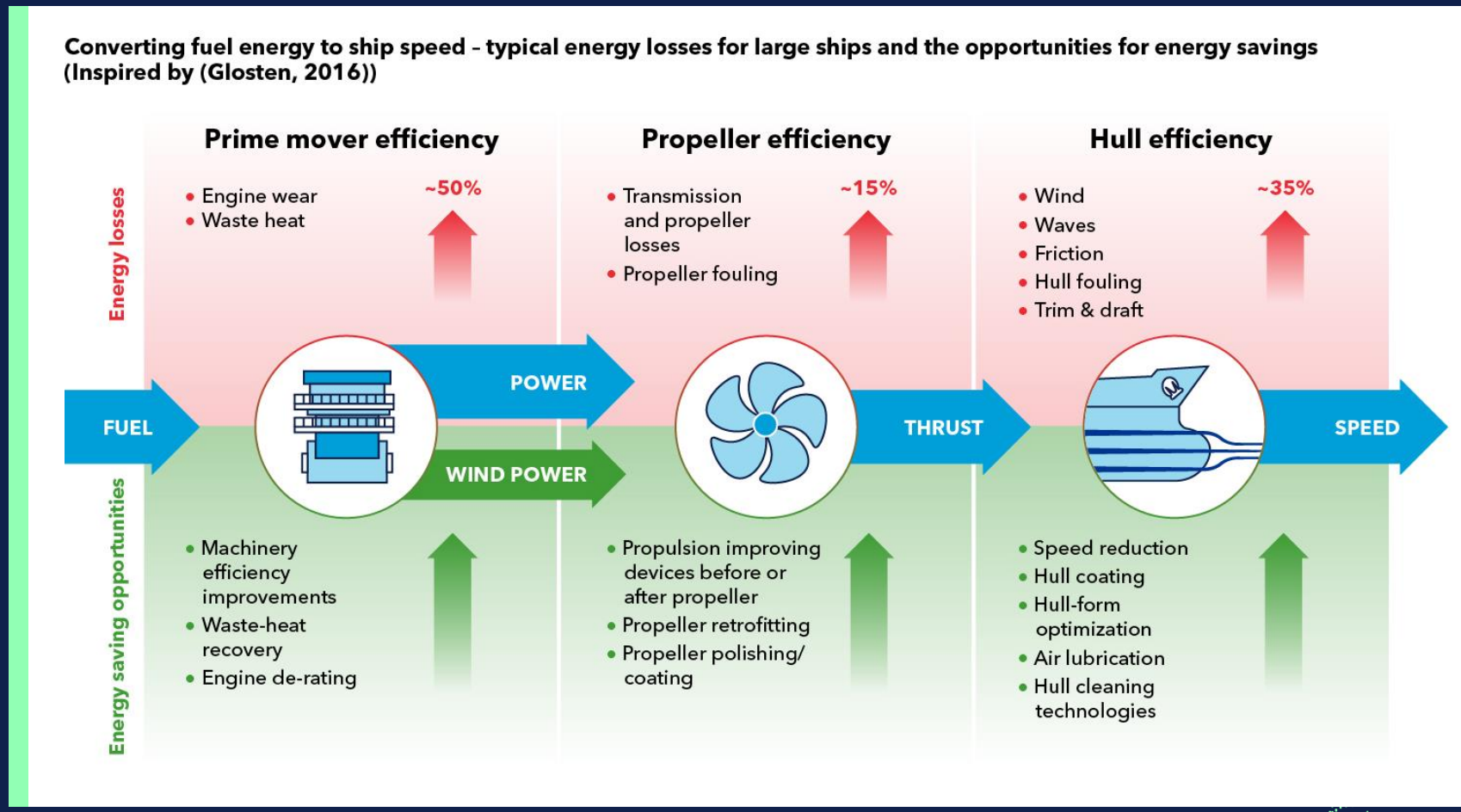


IMO’s 2030 goal of 20% emission reduction is unlikely to be met without significant energy savings





Energy efficiency measures could generate fuel savings of 16% by 2030



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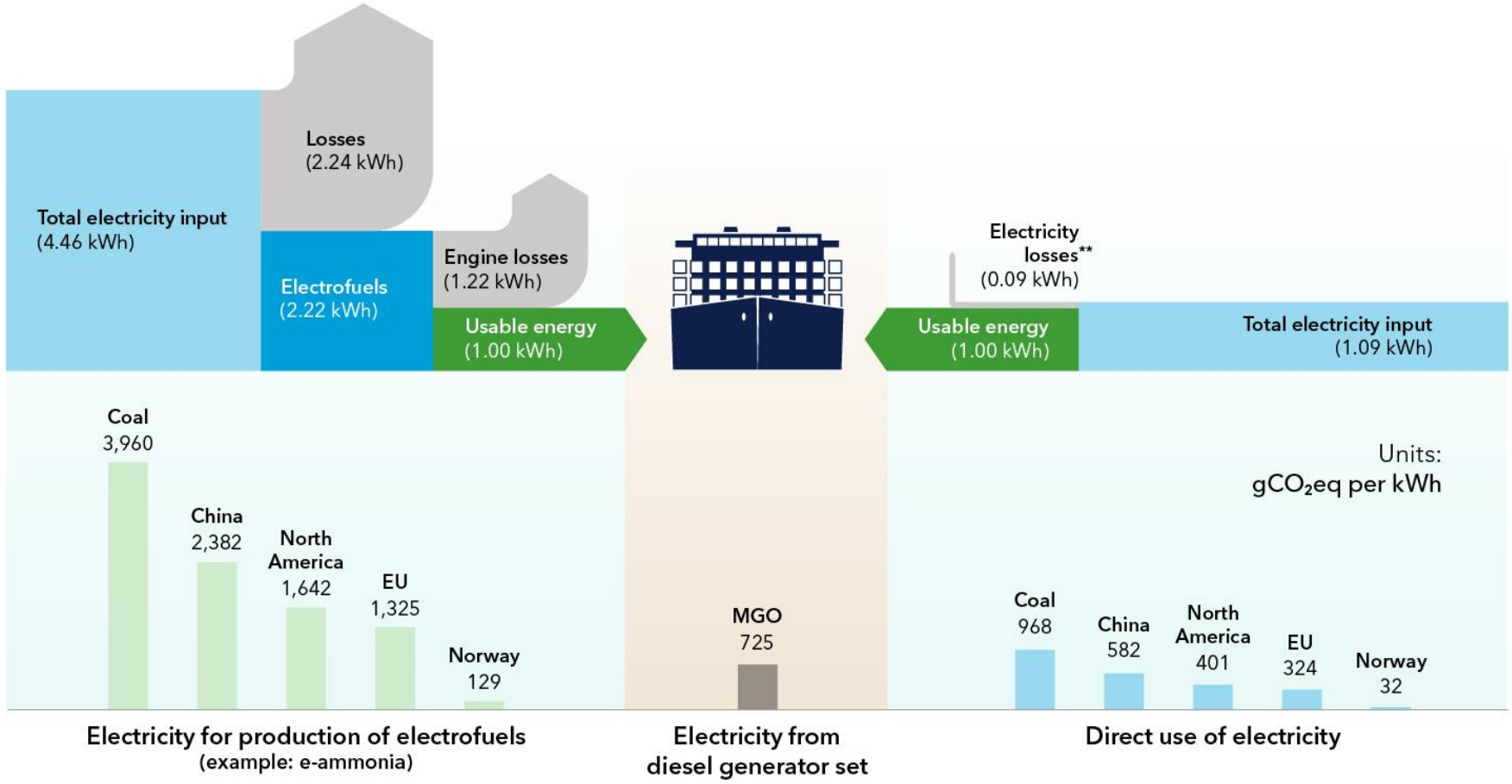
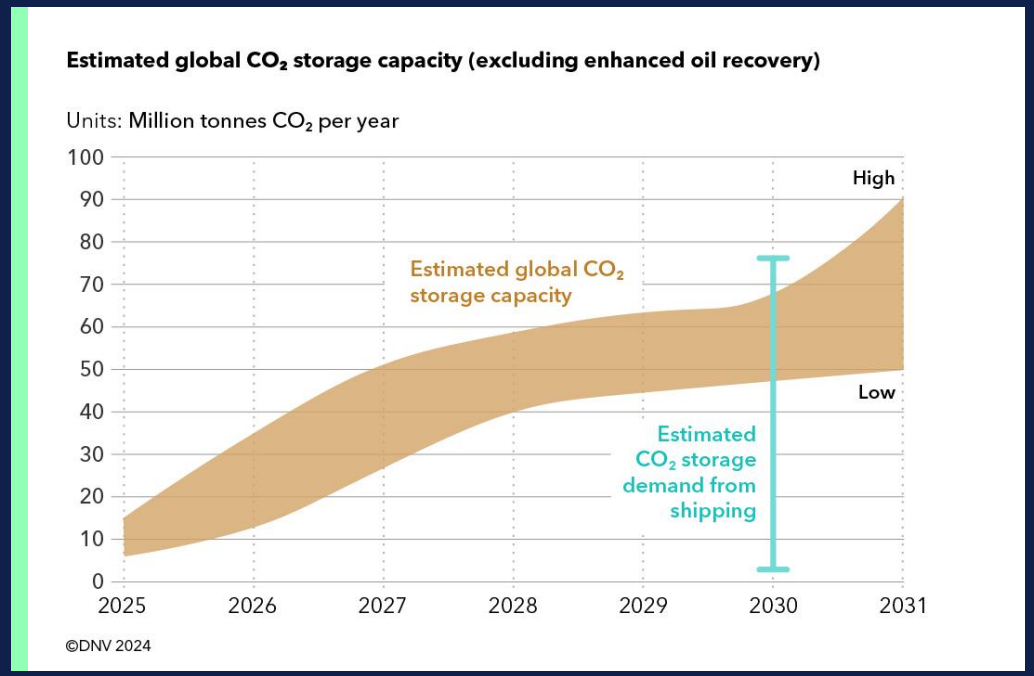
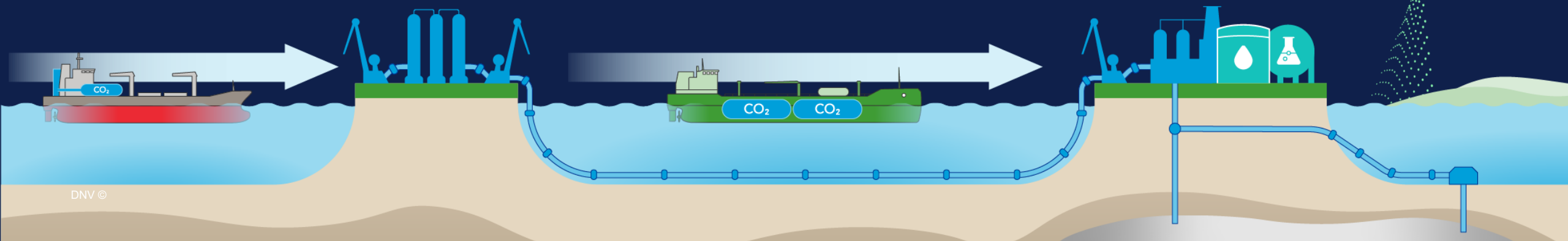
Green shore power can reduce emissions from shipping by 7%



Onboard carbon capture could be the most cost-effective way of decarbonization

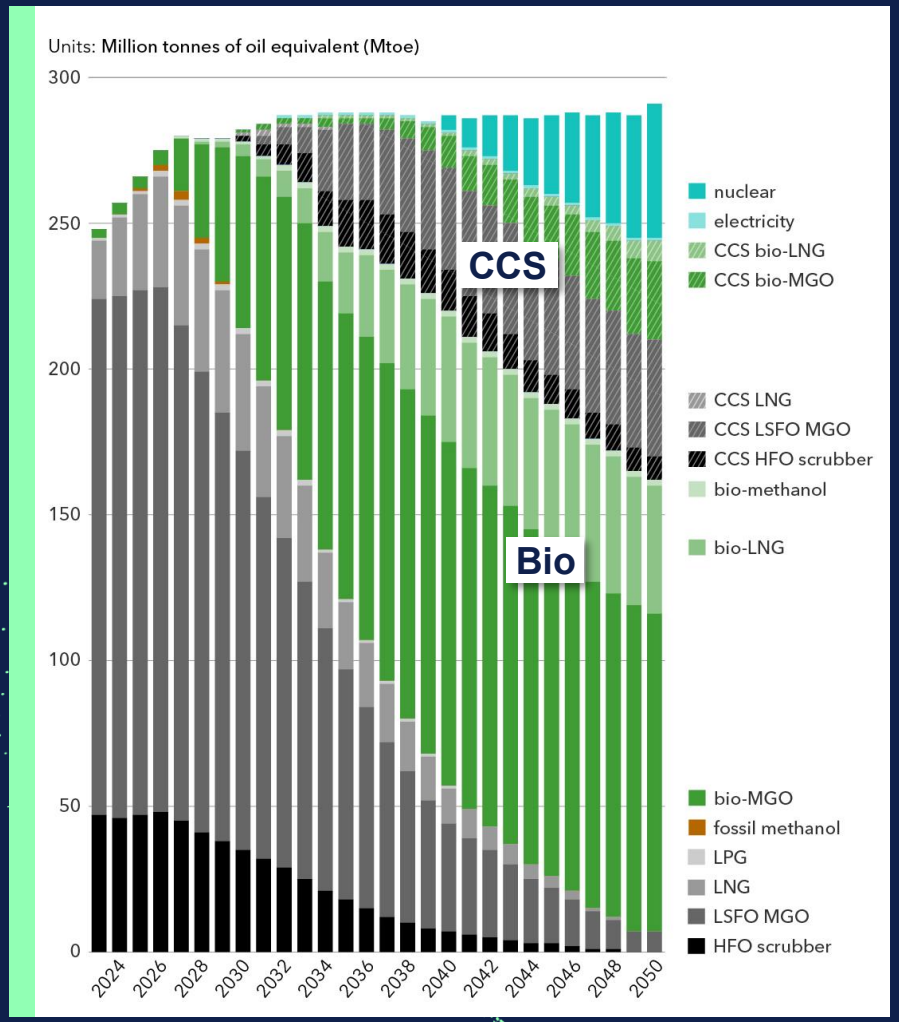


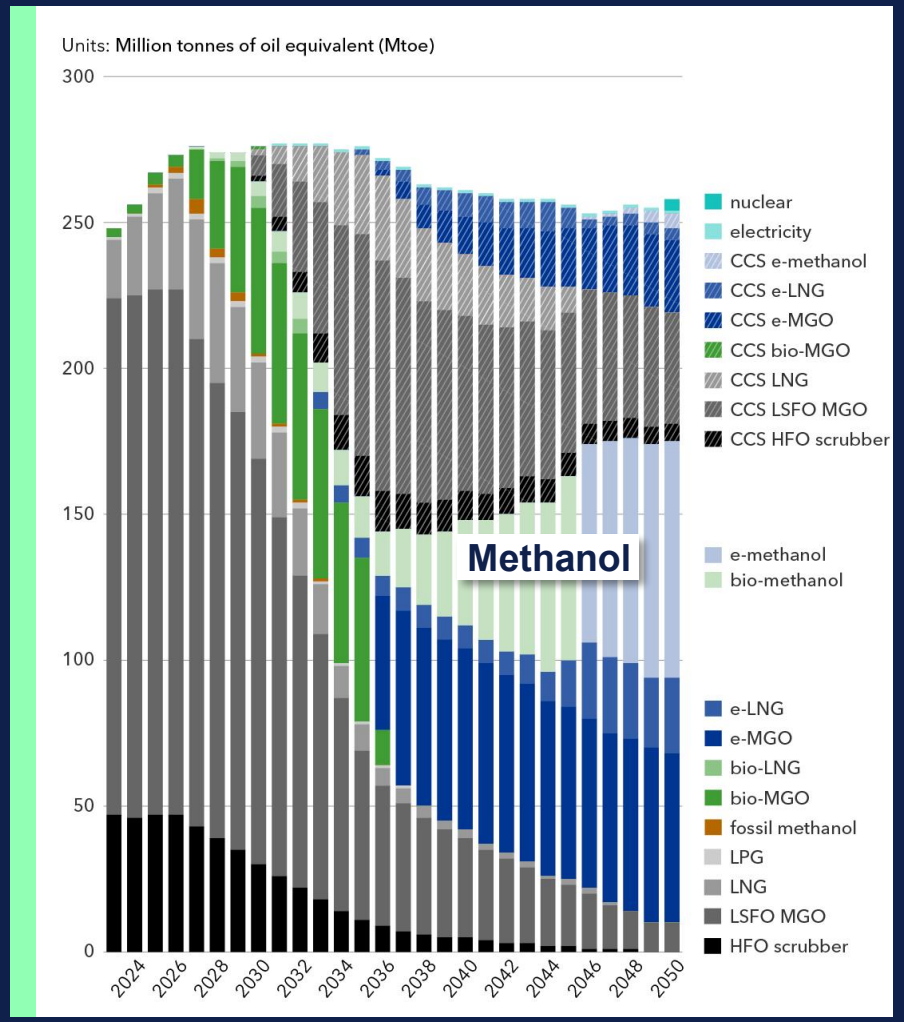
- Infrastructure needs to be built
- Ship technology must be further developed
- Must be evaluated against the costs of carbon-neutral fuels



Four scenarios to prepare for the future

Bio and fossil fuels with CCS scenario – fuel use in shipping by energy





Methanol scenario – fuel use in shipping by energy

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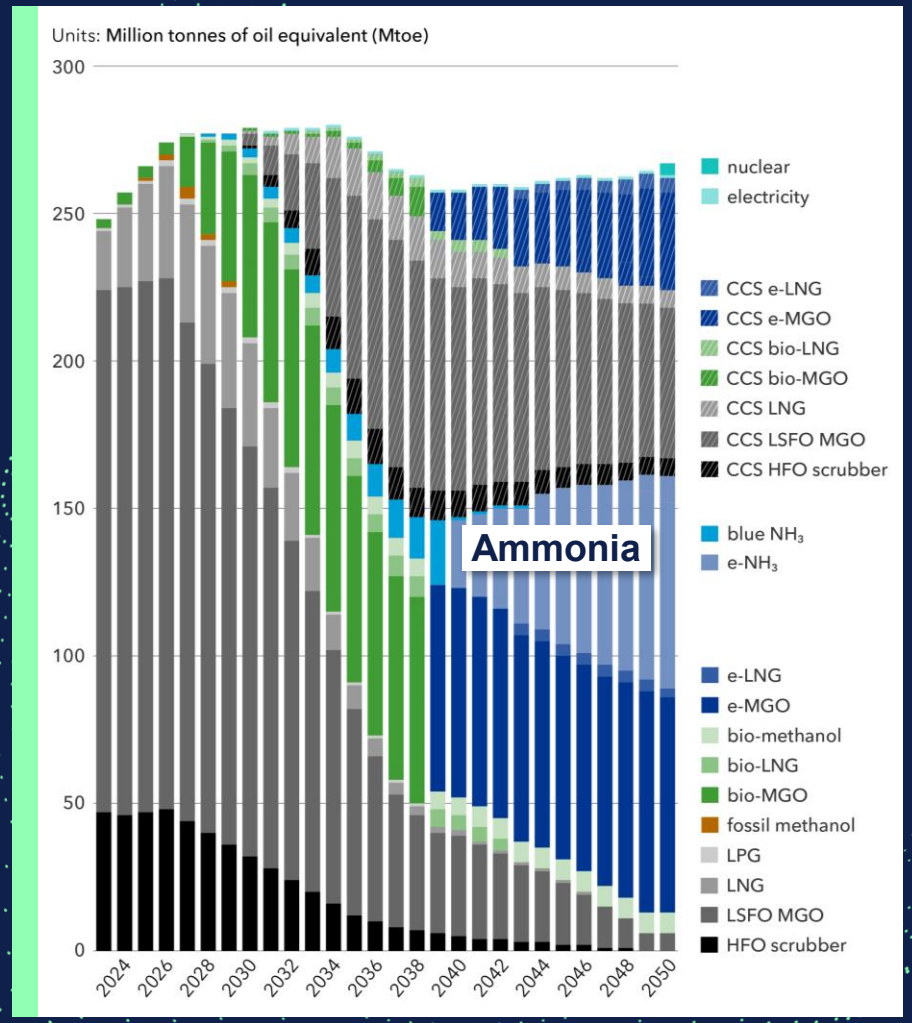
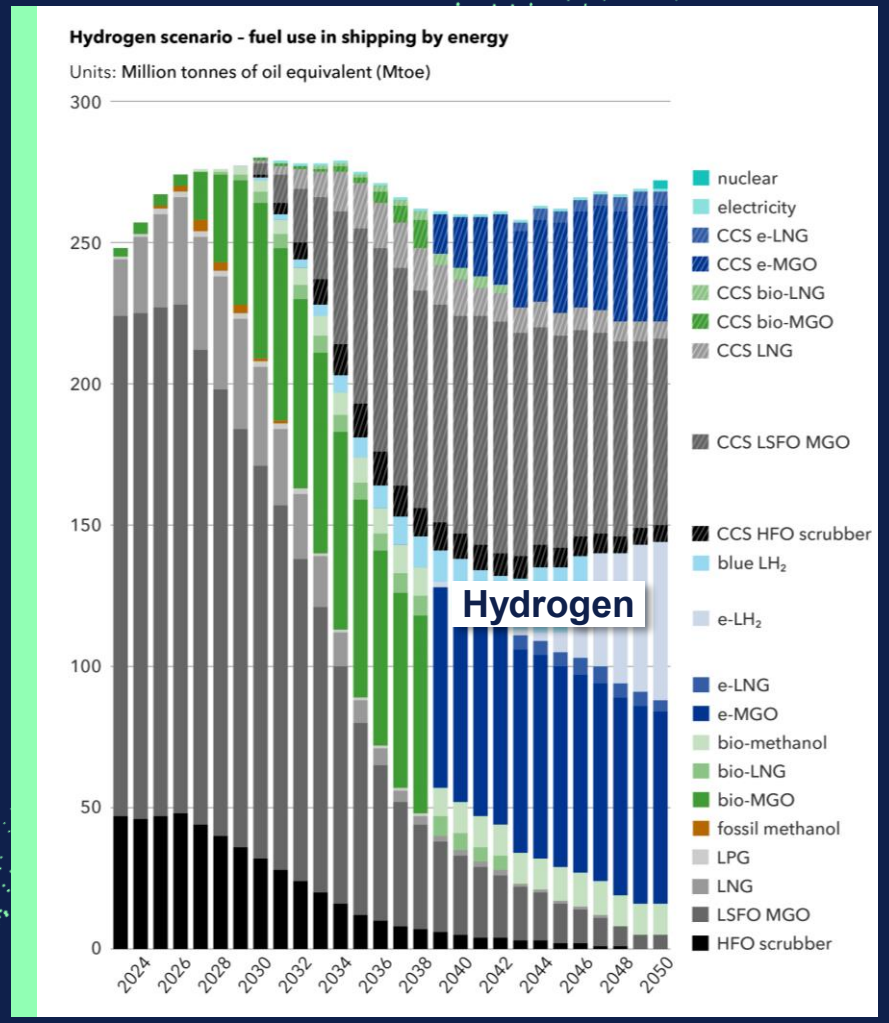
Four scenarios to prepare for the future

Ammonia scenario – fuel use in shipping by energy





Hydrogen scenario – fuel use in shipping by energy

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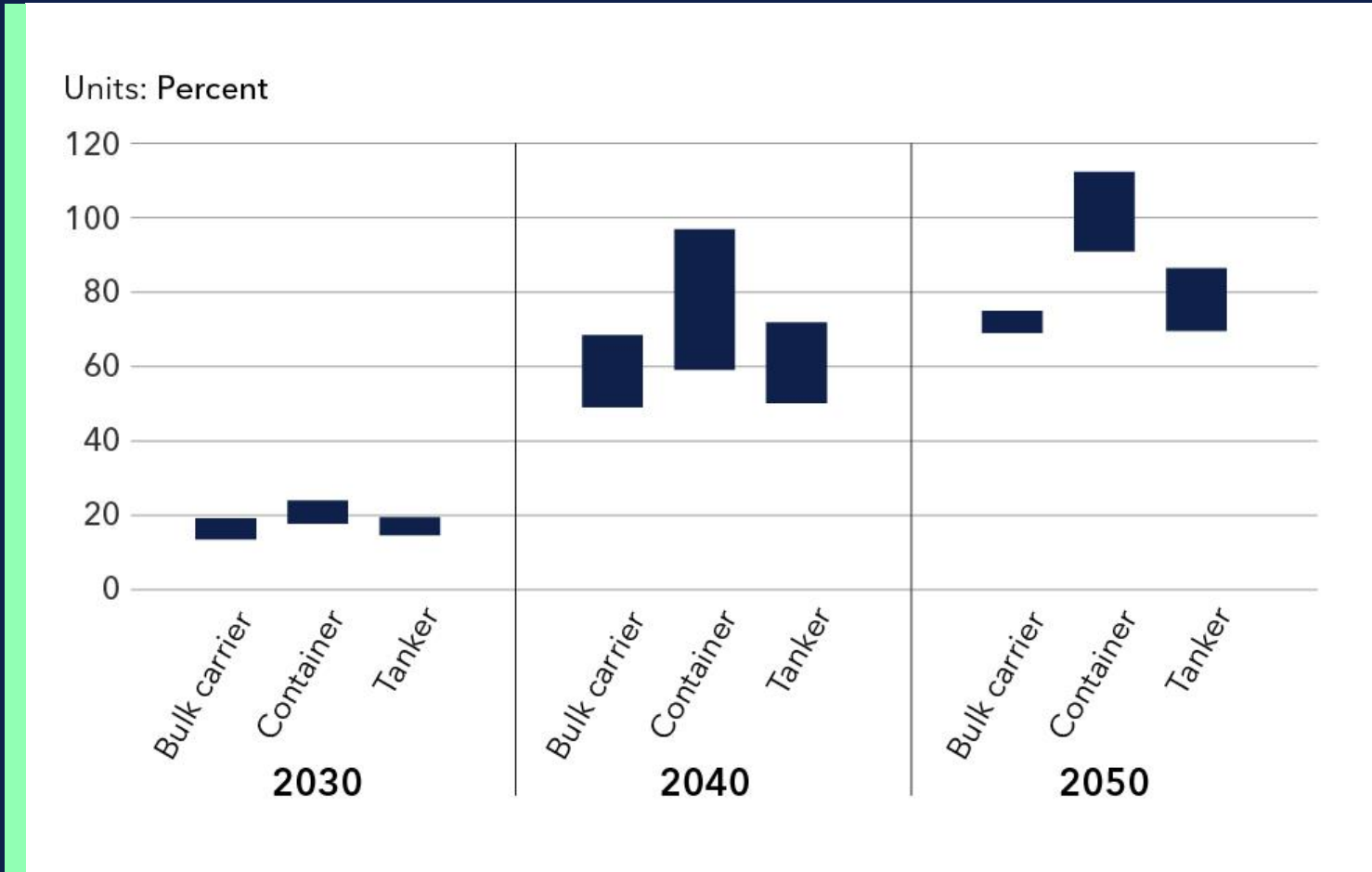
Decarbonizing shipping could double the cost of container-transport



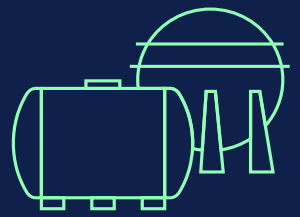
- Decarbonizing shipping will come at a significant cost
- This will be compensated by increased freight rates
- ...and eventually moved through the value chain to consumers as an increase in the price of goods

Key findings

Half the ordered tonnage can use LNG, LPG or methanol in dual-fuel engines

Shore power could reduce the emissions from shipping by up to 7%

Energy efficiency measures could save 16% by 2030, equivalent to 55,000 smallest ships carbon-neutral

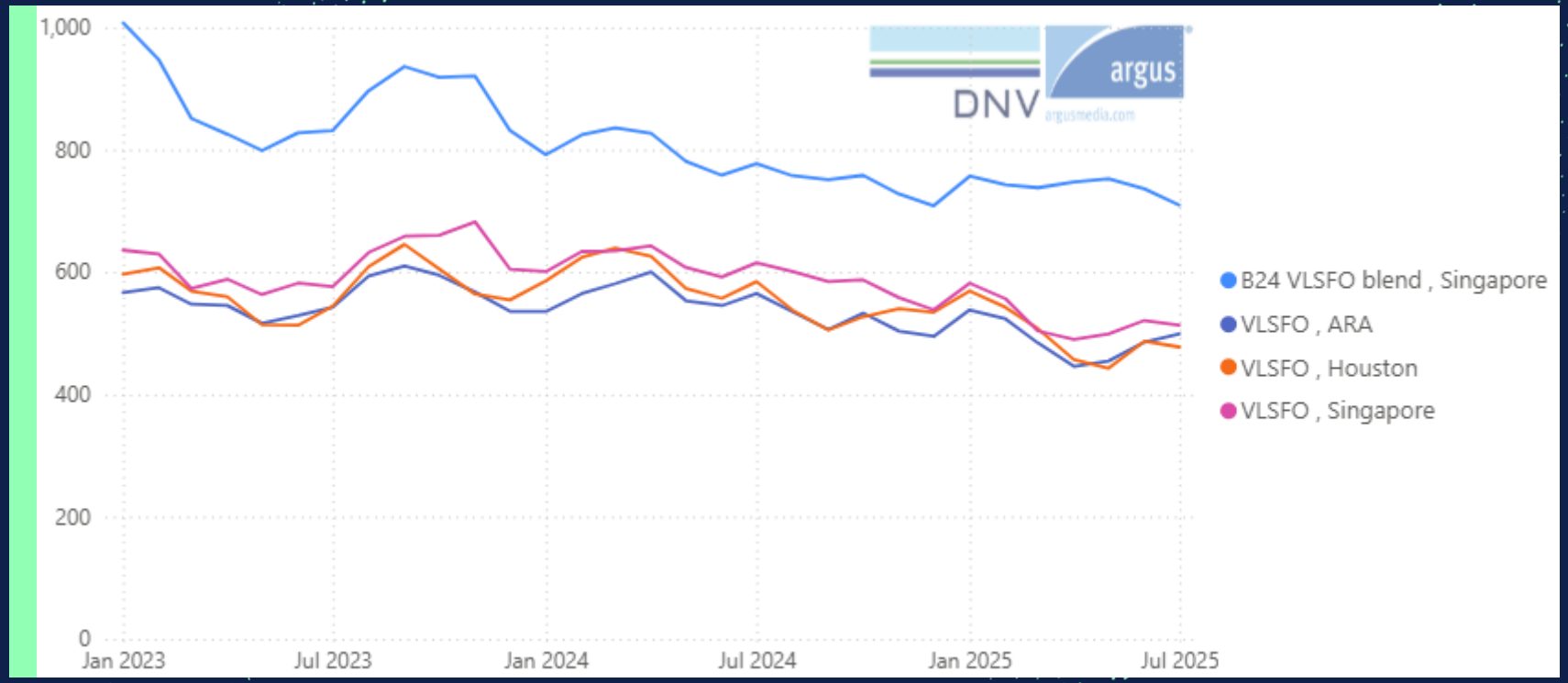


CO_2 storage facilities should be planned in conjunction with major ports

Decarbonizing shipping could double the cost of transporting goods by containers

Biofuels in Shipping

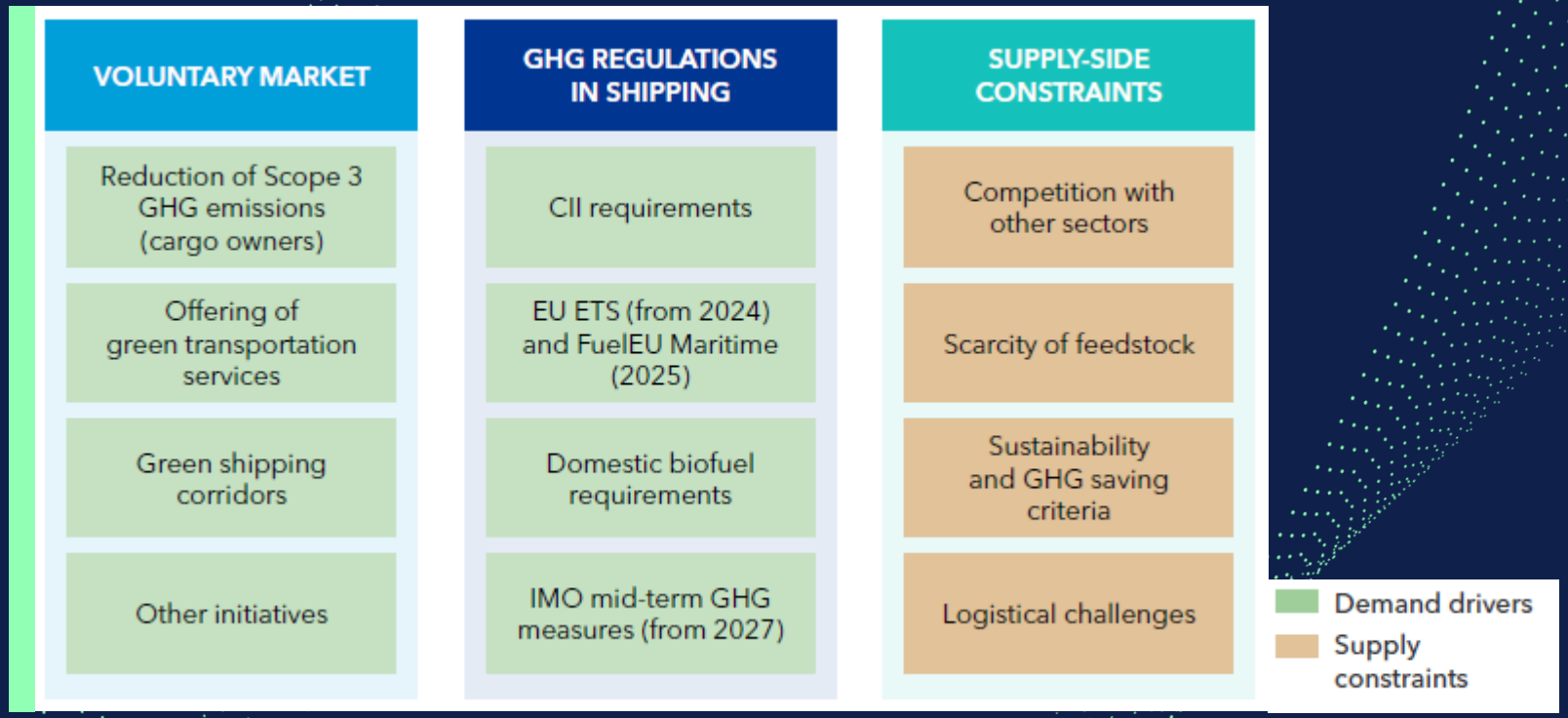
Price and availability are main challenges



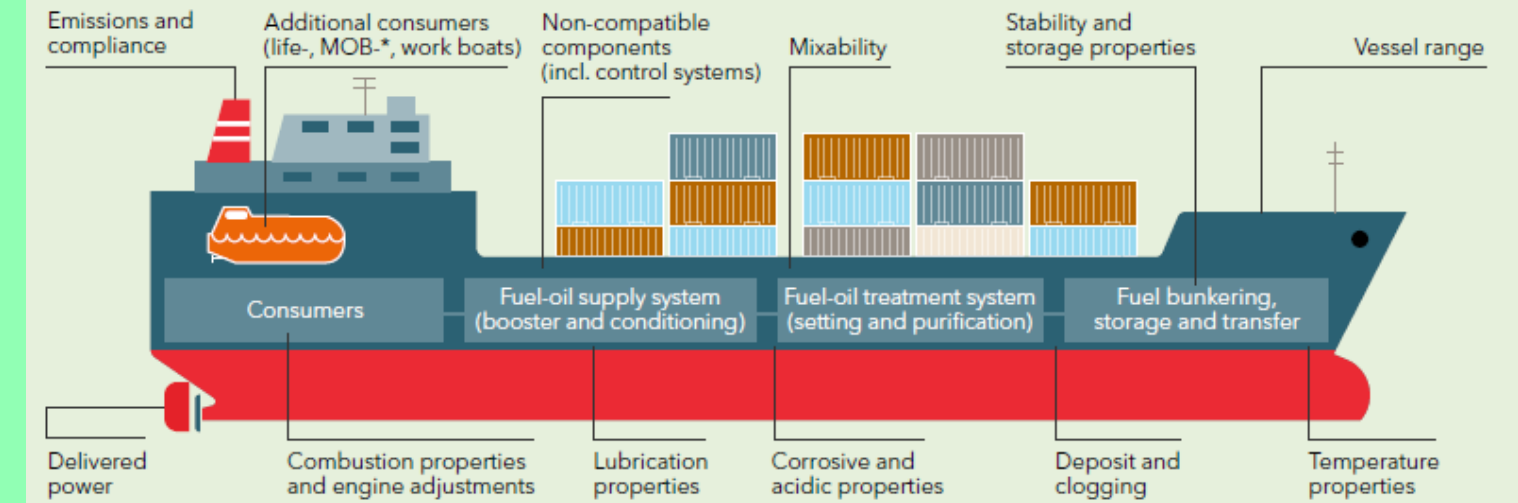
Source: afi.dnv.com

Price and availability are main challenges

Marine biofuel market will be driven by some key factors



Technical and operational considerations to observe



(Baseline: MGO)	FAME	HVO
Energy content	Lower	Comparable
Cetane number	Comparable	Higher
Density	Comparable	Slightly lower
Viscosity	Slightly higher	Slightly lower
Material compatibility	Incompatible with certain materials*	Comparable
Flash point	Higher	Comparable
Lubricity	Good**	Poor
Cold flow properties***	Poor	Good / Comparable
Storage stability	Poor	Good / Comparable

*Corrosive activity varies with quality indicators such as acidity; **FAME maintains good lubricity despite having a very low sulfur content; ***Cloud Point (CP), Pour Point (PP), and Cold Filter Plugging Point (CFPP)

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Key findings

Cost of biofuels is currently 30-40% higher

Wordwide distribution is a challenge – local hubs may be a solution

Operational constraints must be considered

Thank you

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