CIMAC UK National Members Association

J. Dodd

June 16th 2026, Nottingham

Who are CIMAC?

- CIMAC is the leading global non-profit association promoting the development of ship propulsion, train drive and power generation.
  - The association consists of National Member Associations and Corporate Members in America, Asia and Europe.
  - CIMAC provides a forum for technical interchange with all parties interested in piston engines, gas turbine systems, non-shaftline propulsion systems, automation and controls, system integration and digitalization solutions.
  - CIMAC acts as a global platform for discussion through a range of events, namely the CIMAC Congress (once every three years), CIMAC Circles, CASCADES and webinars.
- CIMAC has been granted consultative status with the International Maritime Organization (IMO).
- Association Structure of CIMAC
  - CIMAC's organisational structure is based on the CIMAC Council, the CIMAC Board, and the CIMAC Strategy & Working Groups.
  - The CIMAC Council, which is the decision-making body responsible for CIMAC's policies, consists of the National Member Associations from individual countries and Corporate Members (in countries where there are no National Members Associations).

What does CIMAC do?

- CIMAC covers all aspects of large engines and associated systems
- From Stationary gas engines and locomotives to turbines and large marine 2 and 4 stroke engines
- Covers all conventional and new fuel types
- GHG, digitalization, IMO activity
- Working groups covering fuels, lubricants, after treatment and other topic areas

CIMAC UK National Members Association

- The purpose of CIMAC UK is to enable interested companies to join CIMAC activities
- Membership of CIMAC grants access to working groups and events
- Current CIMAC UK membership consists of
  - 20 corporate members
  - 4 private members
- Including representatives from a wide range of companies spanning the industry
  - Including but not limited to; regulatory bodies, insurers, additive and oil suppliers, fuel suppliers, equipment manufacturers, analysis companies, power plants
- As an organisation we are non-profit and arrange events through the year for the members
  - Members days to engage on topics of interest
  - Visits – for example to this conference
  - Giving younger members the opportunity to present to experienced members

Presentation topics from 2025 Members Day held at Lubrizol;

1. Overcoming the technical barriers of future fuels using additives
2. High-Pressure Dual-Fuel Combustion Systems for Sustainable Maritime Engines
3. Cashew Nutshell Liquid as a Biofuel: Use of Additives to Improve Engine Operability
4. Biofuels for Marine and Development of Alternative Specifications
5. Towards a Mono-Fuel Ammonia Engine with near zero tailpipe emissions of NOx and Unburned Ammonia


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INTERNATIONAL COUNCIL
Power | Drives | Propulsion

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The impact of future fuels on lubrication technology

James Dodd – Marine and Large Engine Industry Liaison Manager

June 17th, 2026

Marine industry objectives

Infineum toolbox of solutions

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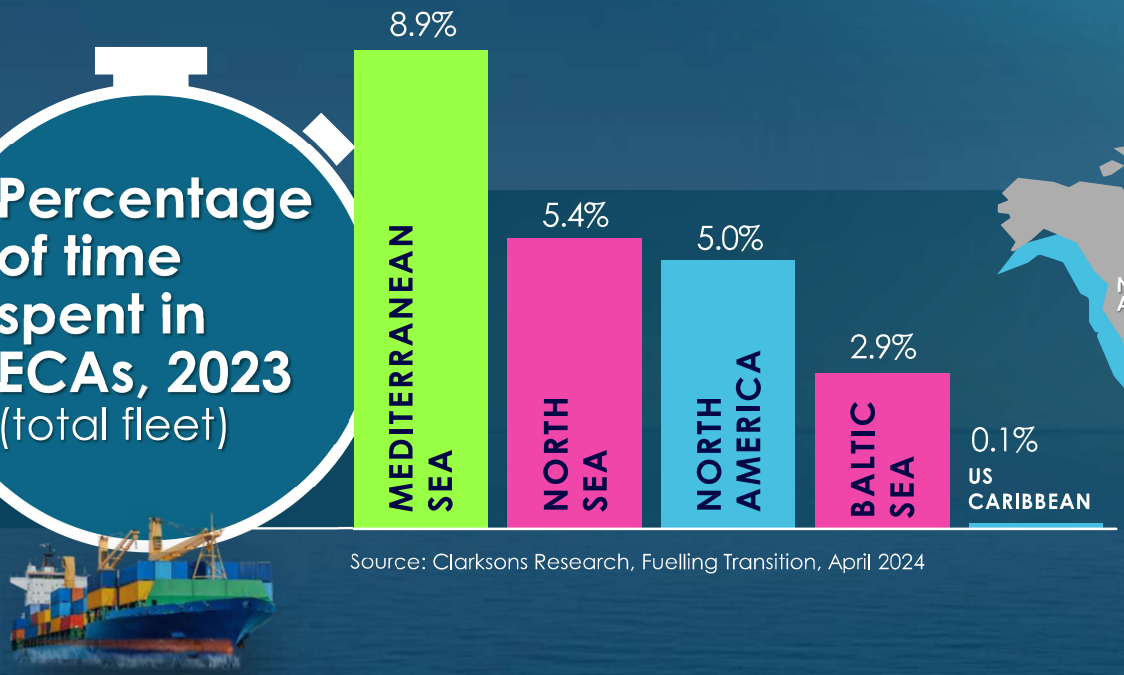
IMO 2020

New Fuels

Net Zero

Percentage of time spent in ECAs, 2023 (total fleet)



Source: Clarksons Research, Fuelling Transition, April 2024

ECA: 0.1% m/m SOx & Tier III NOx

0.1% m/m SOx and PM & Tier III NOx

0.1% m/m SOx and PM

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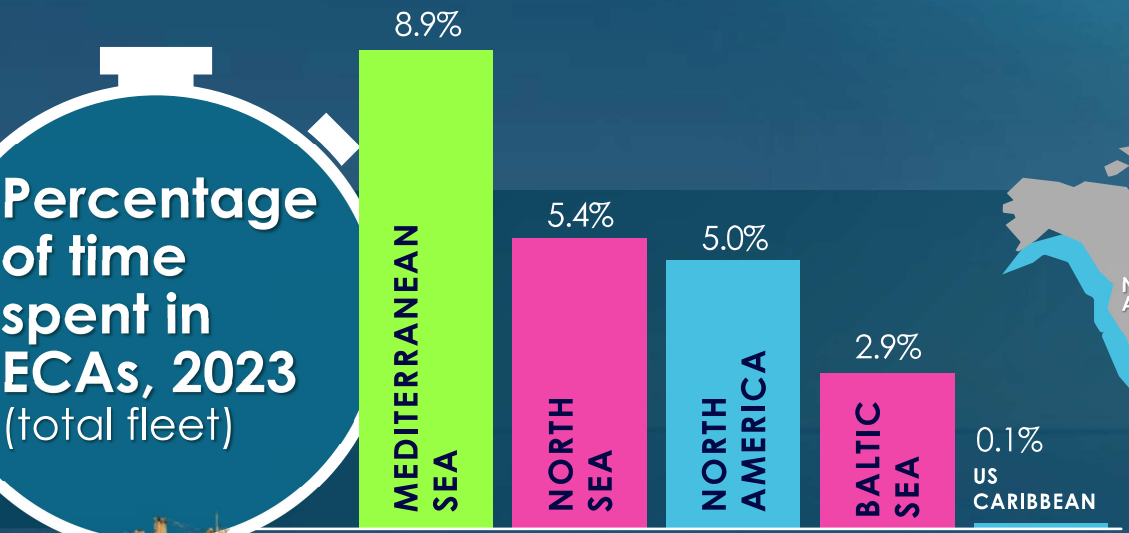
Percentage of time spent in ECAs, 2023 (total fleet)



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ECA: 0.1% m/m SOx & Tier III NOx

0.1% m/m SOx and PM & Tier III NOx

0.1% m/m SOx and PM

Compliance

Switch to **0.1% S fuel**

Use a **scrubber**

Switch to **alternate fuel**

Use **fuel additives**

Fuel, additive and lubricants compatibility essential

Approved & Nominated ECAs

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Canadian Arctic & Norwegian Sea:
- NOx limits: 1st March 2026
- Sulphur & PM limits 1st March 2027

North-East Atlantic ECA:
- SOx limits take effect in September 2028

Note: areas are indicative only, for full Lat/Long information visit imo.com

IMO strategy on GHG reductions

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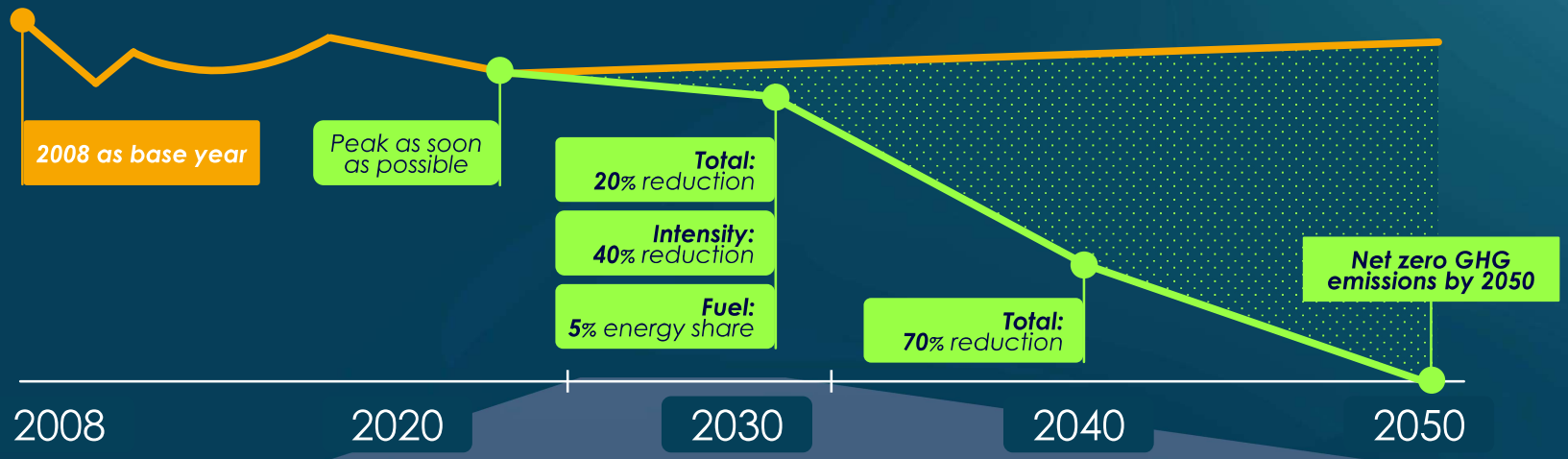
Units: GHG emissions -



Emission pathway in line with IMO's GHG Strategy

Business-as-usual emissions

Emission gap

OEM hardware readiness -

OEM hardware readiness -

OEM	LNG	LPG	Methanol	Ammonia	Hydrogen
Everllence 2T	B&W ME-GA B&W ME-GI	B&W LGIP B&W ME-GIE	B&W ME-GI B&W ME-LGIM	**2023:** start of single cylinder test **2024:** full scale engine test **2025:** first Ammonia engine, B&W ME-LGIA	MITSUI E&S Co. Ltd. (demo)
WinGD	X-DF	X-DF-P	X-DF-M	X-DF-A (2025-2026)	
Everllence 4T	Everllence DF range		L21/31 DF-M	**2020:** AmmoniaMot consortium	**2030:** 100% H2
Wärtsilä	Wärtsilä DF range		Wärtsilä Methanol series	Wärtsilä 25 Ammonia	**2026:** 100% H2

Additives enables the transition with new technology for fuel and lubricants

Greenhouse gas reduction options

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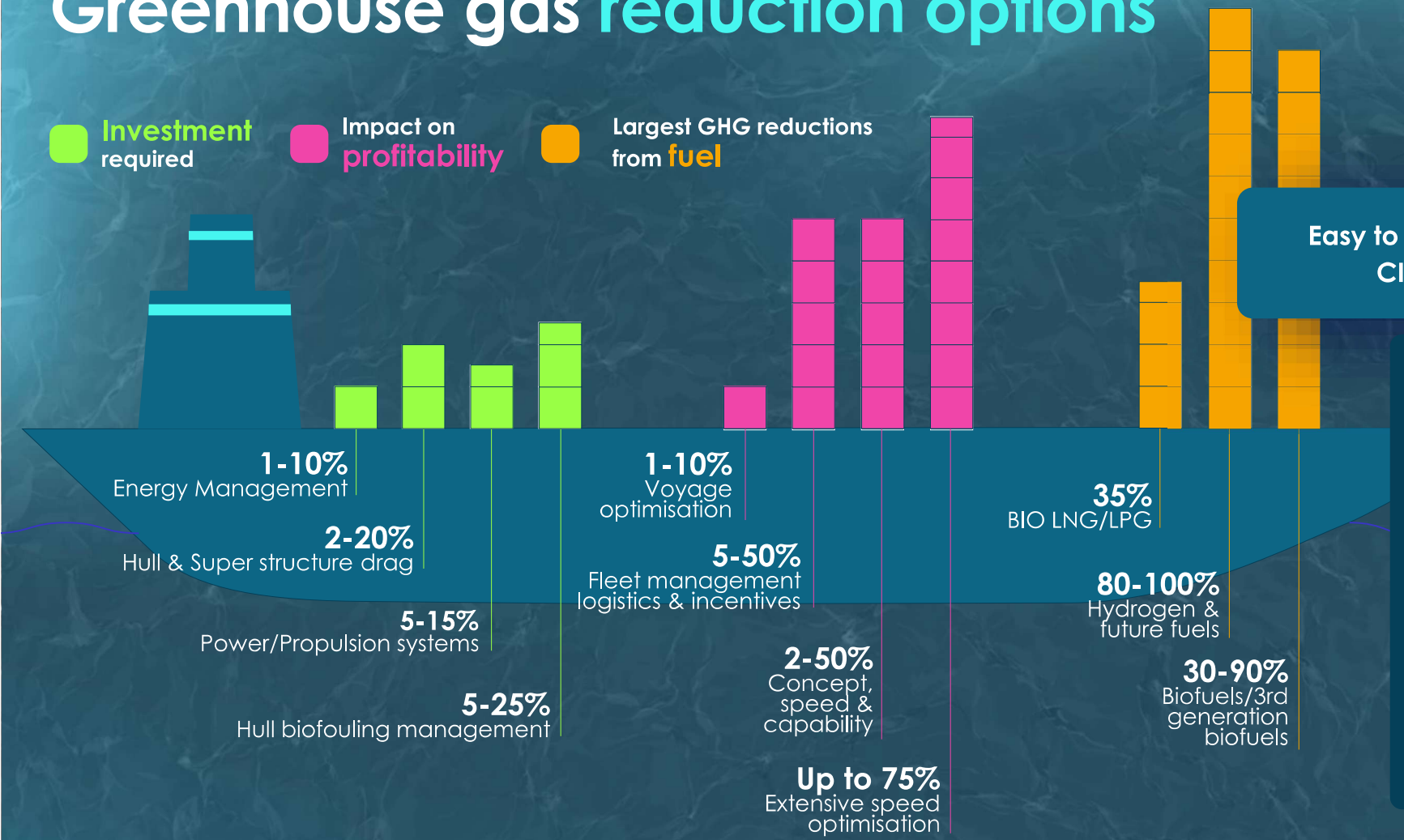
Investment required

Impact on profitability

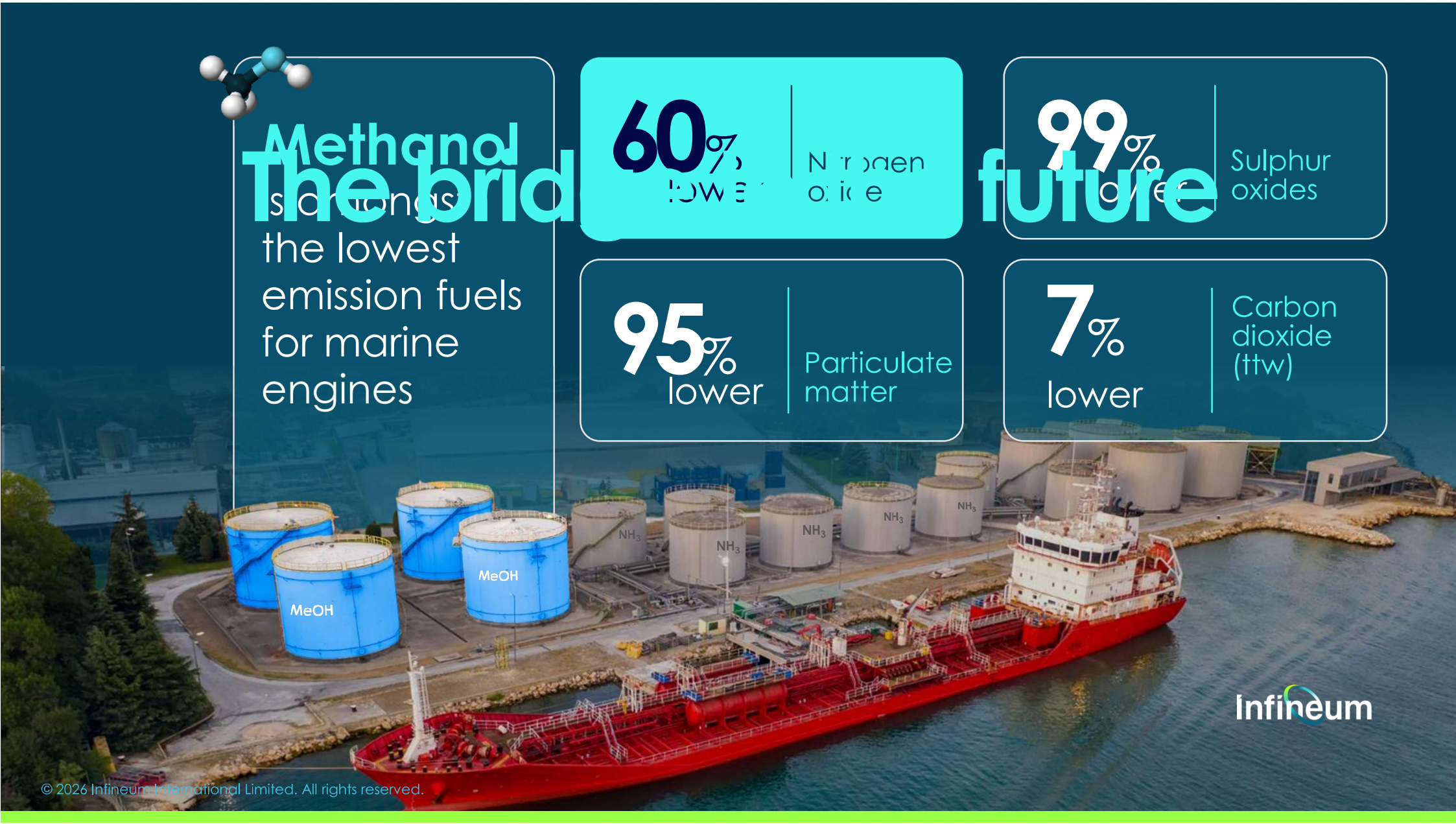
Largest GHG reductions from fuel



Easy to implement and cost effective CII reduction measures needed

Multi-fuel options will be used until fuel availability is realised

% figures are approximate GHG reduction potential



Global methanol terminals

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Methanol Bunkering

15 Active

20 Under development

LNG Bunkering

198 Active

78 Under development

Source: Clarksons Research 121th Tracking Green Technology Uptake
Source: AFI, 2023

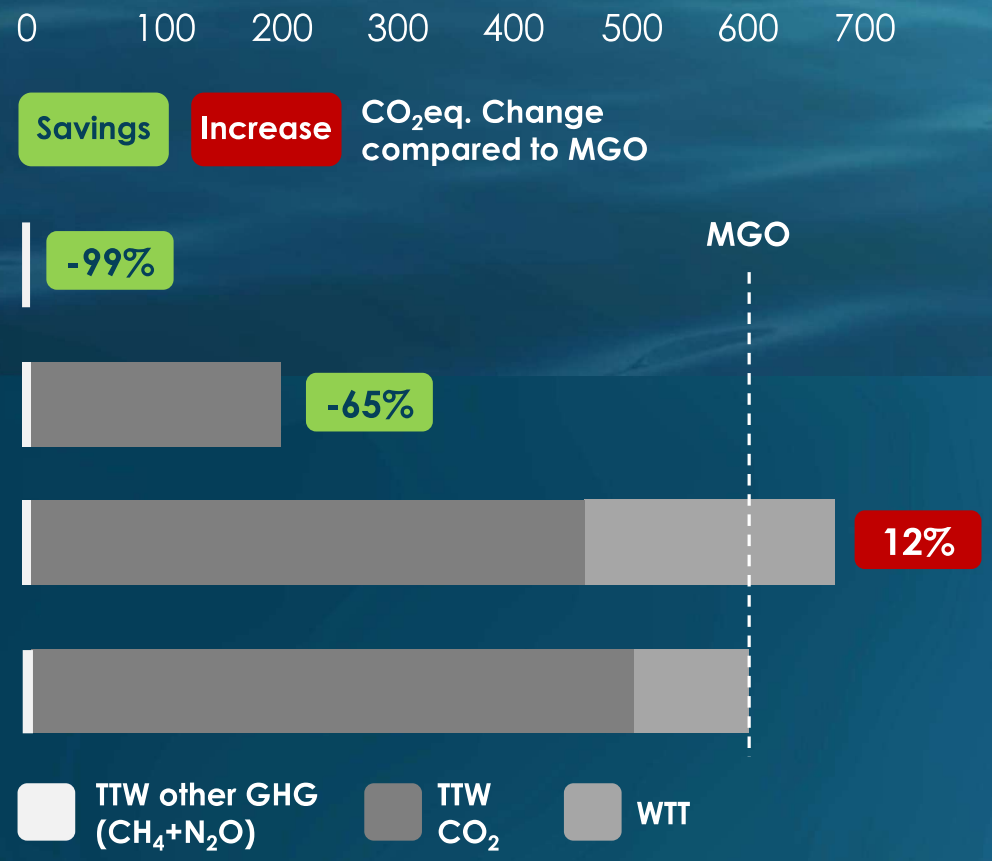
Colours of Methanol:

Made from **blue hydrogen -**
Mainly natural gas and carbon capture
E-Methanol (RES+DAC)

Made from **Green hydrogen -**
Biomass and renewable electricity
BioMethanol

Made from **Grey hydrogen -**
Natural gas – most common form today
Methanol (natural gas)

MGO
(Baseline)



Methanol

is amongst the lowest emission fuels for marine engines

Benefits

Proven, approved and straightforward to implement

Readily available storage and handling facilities

Single fuel option for main and auxiliary engines

Easy to store and handle on board ship

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Methanol

is amongst the lowest emission fuels for marine engines

Challenges

Corrosion

Component damage

Safety

Fuel leaks/system failures

Lubricity

Fuel system damage

Reduced efficiency

Increased maintenance costs

Additives solve potential lubricity concerns

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No CO_2, sulphur or particulate emissions when combusted

Ammonia provides a **carbon free** option

70 %

of the 185 million tonnes produced goes to make fertilizer

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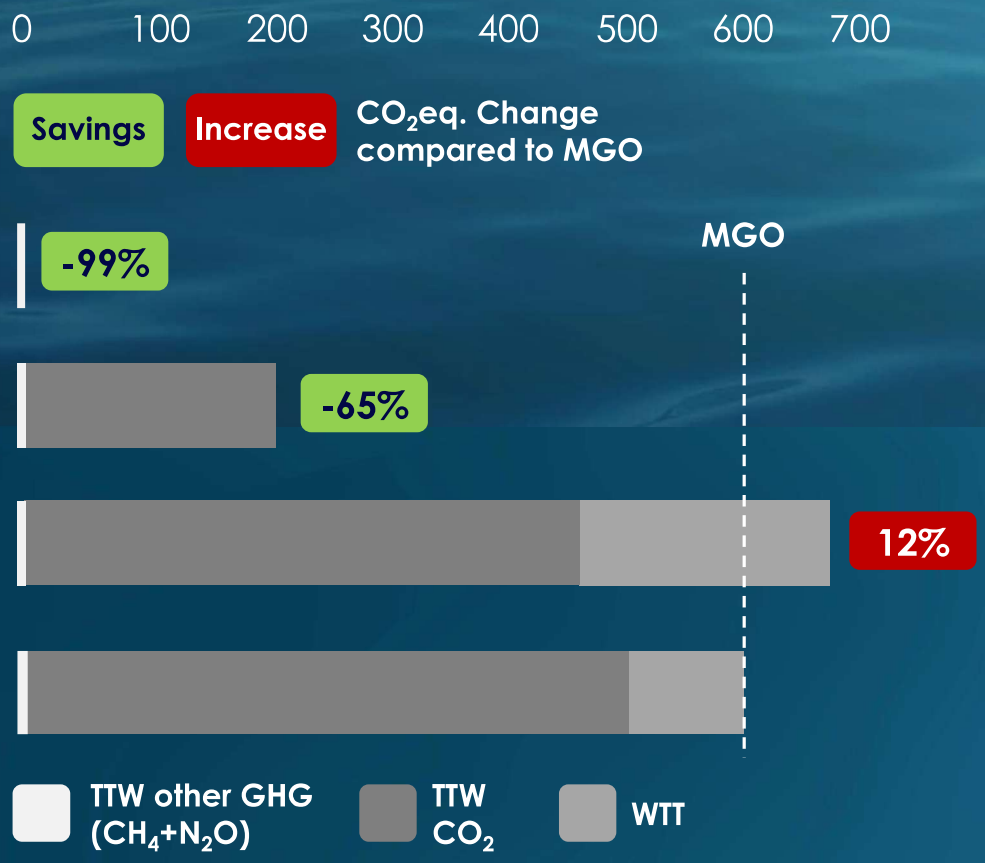
Colours of Ammonia:

Made from **blue hydrogen -**
Mainly natural gas and carbon capture

Made from **Green hydrogen -**
Biomass and renewable electricity

Made from **Grey hydrogen -**
Natural gas – most common form today



Benefits

Reduced CO_2 equivalent

Some infrastructure in place

Ammonia provides a carbon free option

Challenges

Partnerships needed to secure supply

Need significant investment, innovation and infrastructure

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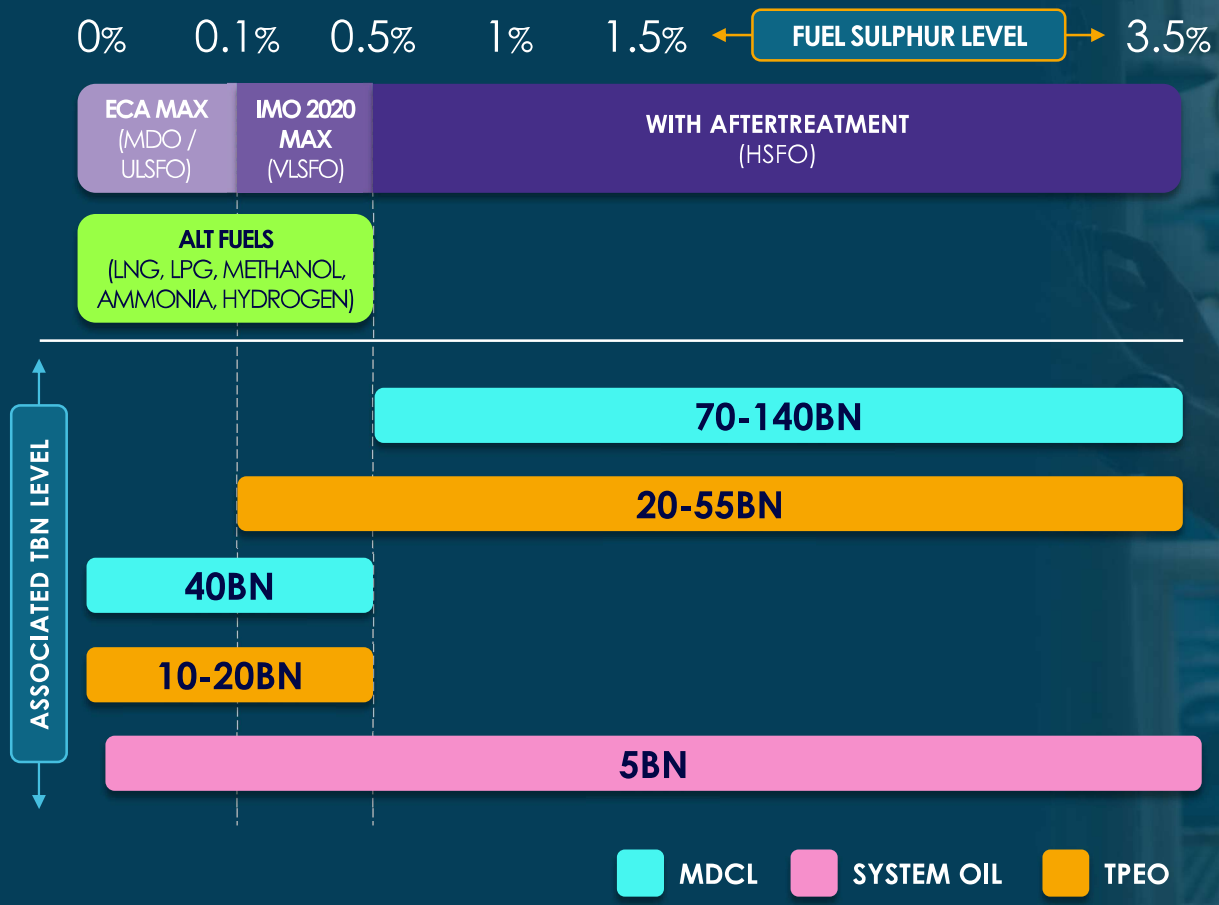
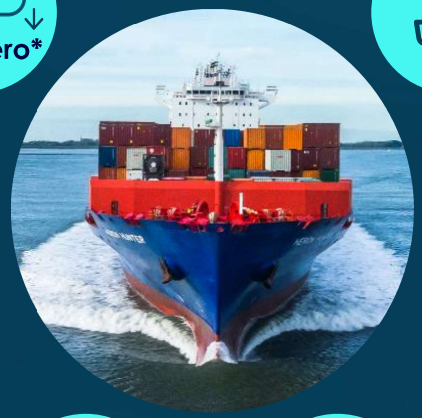
Protection in a multi-fuel multi–engine world



- >500,000 hours testing
- 2 and 4 stroke engines
- All conventional fuels
- And evaluating those coming in the future
- In GpI and GpII base stocks
- Approvals with all of the major OEMs

THE FUTURE

Continued challenges drive change



GHG regulations IMO 2030

CO_2 40%**

NOx/PM emissions

GHG regulations IMO 2050

CO_2 Net Zero*

Hardware design compatibility

Multi-fuel use

Cost effective fit for purpose performance

Consumer requirements

Performance challenges, driven by the introduction of further regulatory limits and market needs, will require the development of innovative solutions

Lubricant and **fuel additives** will be an integral part of many of the solutions

*by or around, i.e. close to, 2050
**reduction in carbon intensity compared to 2008

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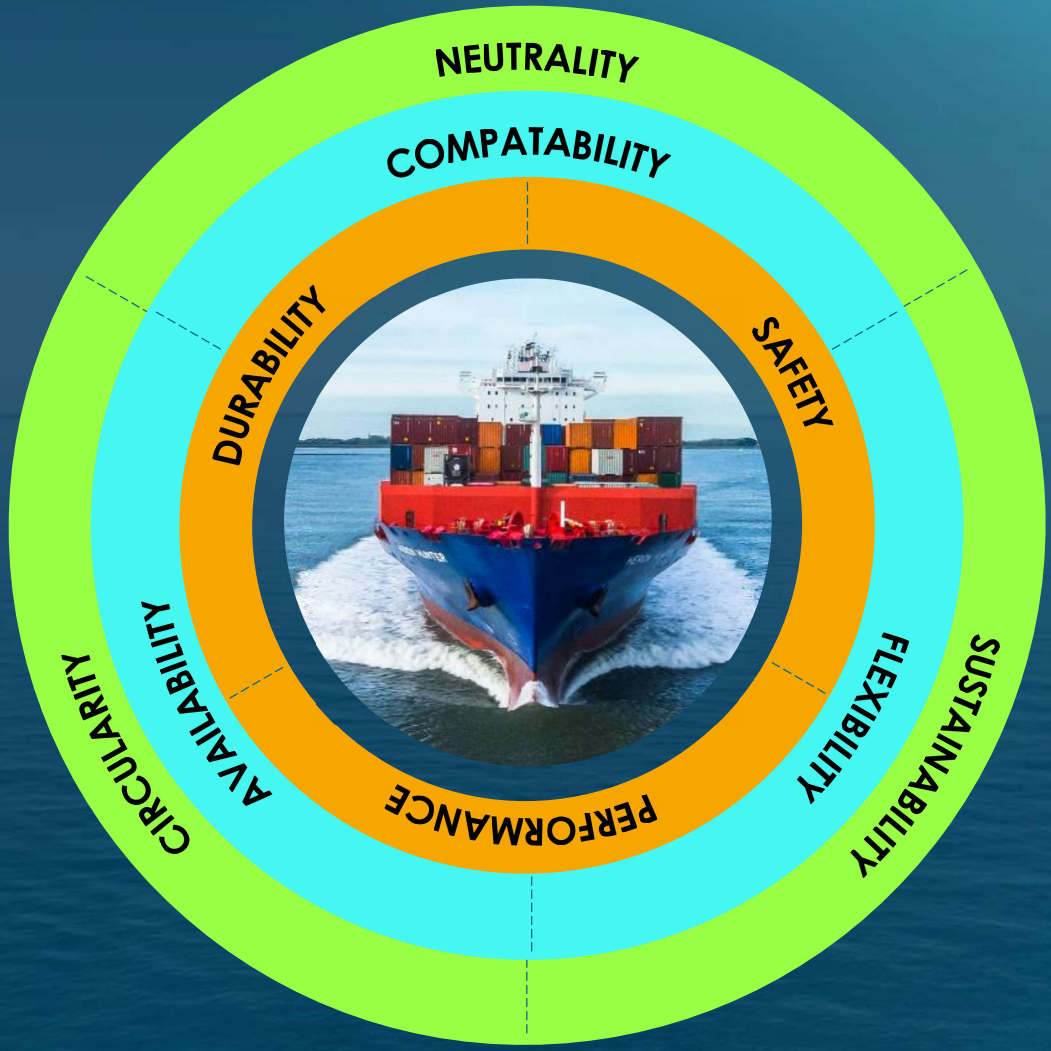

Summary

Challenges of the regulators, OEMs and other equipment suppliers are increasing the complexity of the engine system

The introduction of new fuels means the lubricant should be able to deal with different by-products

Lubrication development is enabling the combination of new hardware and fuels in an increasingly scrutinised industry

Lubricant additives allow engine operation in a multitude of scenarios (2T, 4T, dual fuel and others)

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Thank you

Formulating tomorrow together