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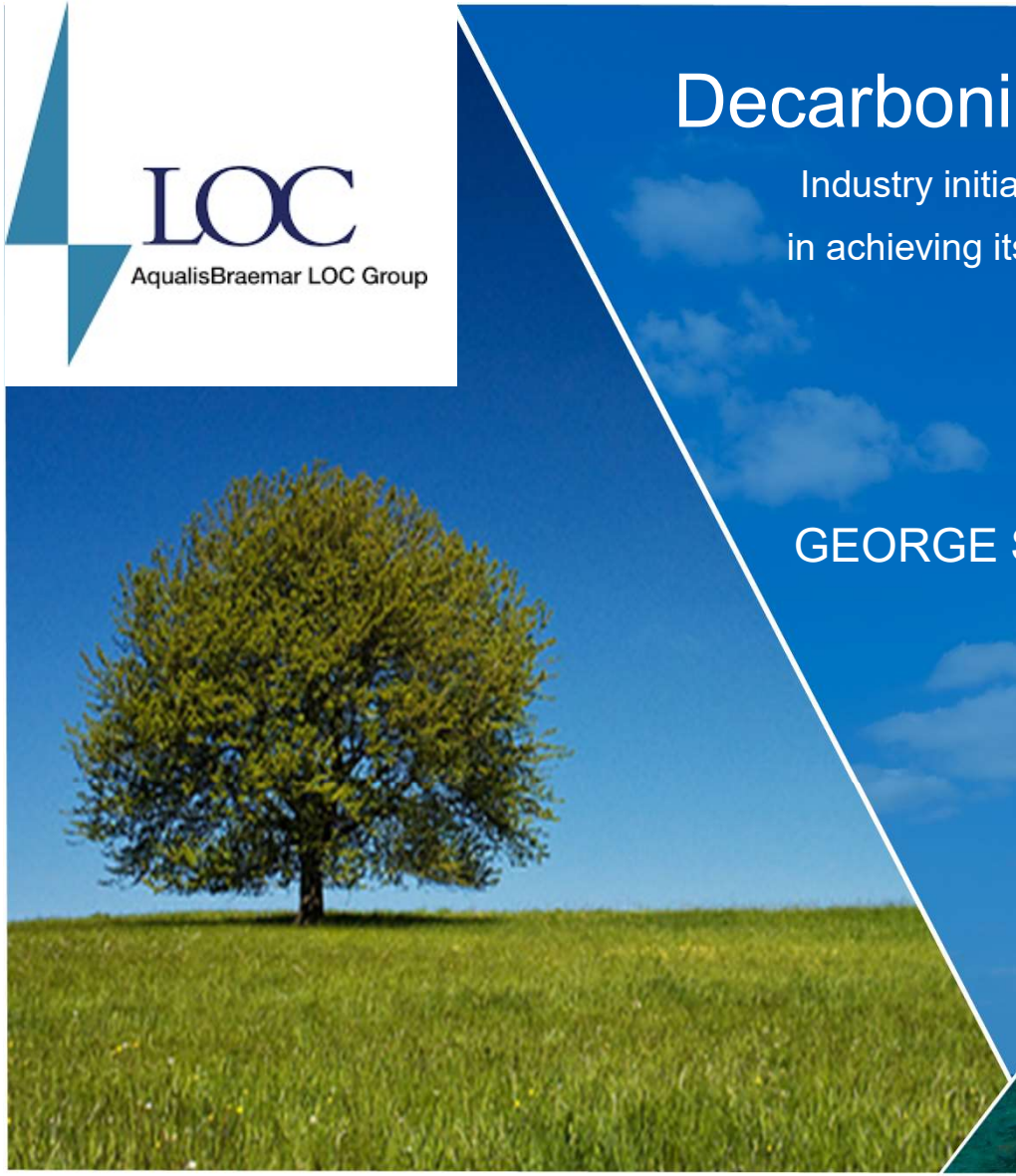
Decarbonisation Initiatives

Industry initiatives to support the IMO
in achieving its decarbonisation targets

GEORGE SAVVOPOULOS



Introducing AqualisBraemar LOC

IUMI International Union of Marine Insurance

A **leading** independent offshore energy and marine consultancy.

Deepest pool of **world-class expertise** across marine, engineering and adjusting disciplines.

Global partner with double the presence: 67 offices, 39 countries.

Trusted technical advisor **driving the energy transition** across energy and oceans.

Broader service offering, providing all-round support, no matter the locations, size or type of project.

Commitment to **50% of revenues** from **renewables** and other CO2-reducing activities **by 2025.**

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3

Greenhouse gas emissions

A touch on the basics

11

Industry initiatives on decarbonisation

The Poseidon Principles, the Sea Cargo Charter

10

Our involvement and insights

How does the industry do against the emissions targets

3

The insurance industry

The influence of carbon initiatives to insurance.

Greenhouse gas emissions

A touch on the basics

Greenhouse gasses

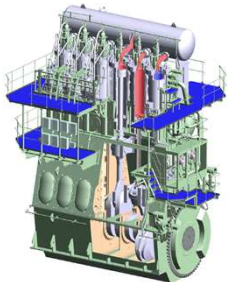
CH_4 Methane

Methane slip

SO_x Sulphur Oxides

IMO INTERNATIONAL MARITIME ORGANIZATION —2020—

NO_x Nitrogen Oxides



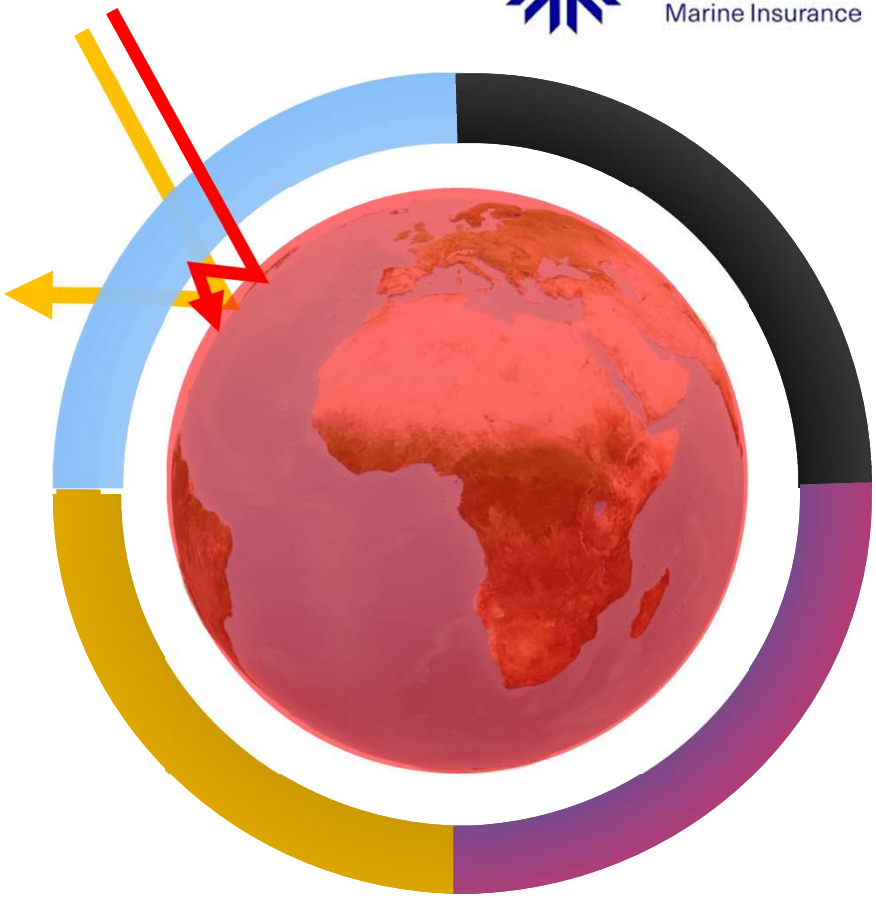
Tier I

Tier II

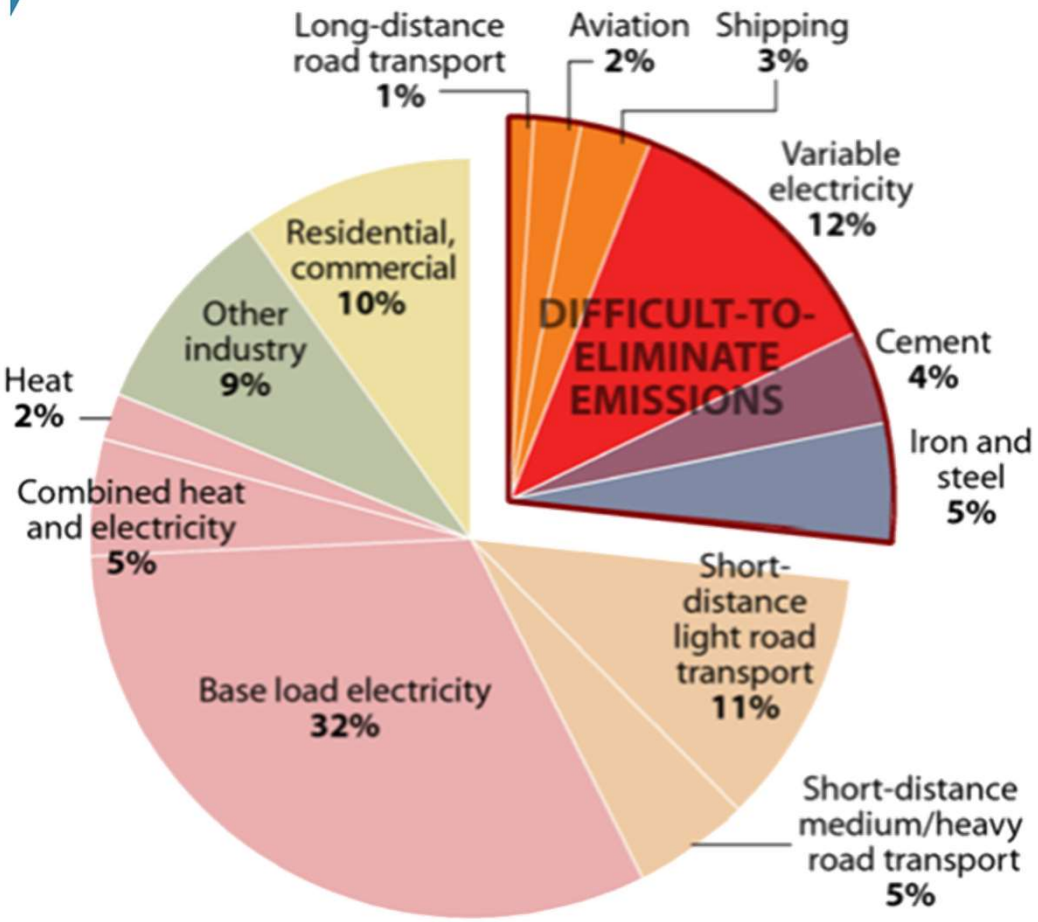
Tier III

CO_2 Carbon Dioxide

IMO INTERNATIONAL MARITIME ORGANIZATION —2050—



How does shipping do?



IUMI
International
Union of
Marine Insurance

MARPOL
International Convention for the Prevention of Pollution from Ships

IMO
INTERNATIONAL
MARITIME
ORGANIZATION

—2050—

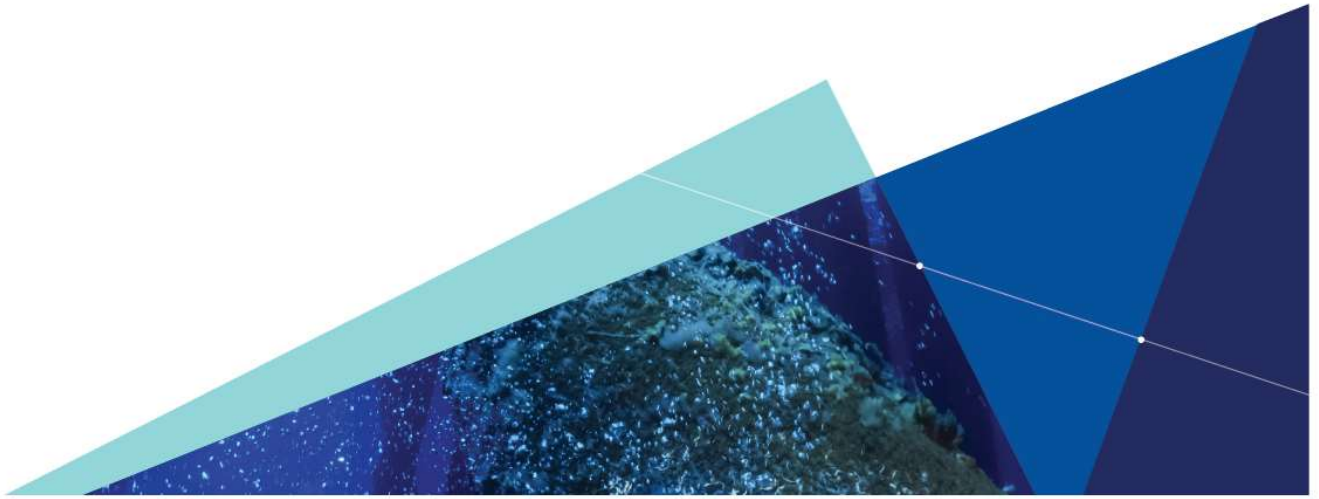
Why so much attention to CO_2?

Our industry is carbon-heavy.
Our GHG emissions are rich in CO_2

Industry initiatives on decarbonisation

The Poseidon Principles

The Sea Cargo Charter



What is the industry doing to contribute?

Financial Institutions

Jun 2019

POSEIDON PRINCIPLES

A group of 11 major banks, financing over 20 percent of the global shipping fleet*, have agreed to adjust their lending procedures in order to incentivize the decarbonization of maritime vessels.

*Currently 19 major banks, financing over 35 percent of the global shipping fleet

www.poseidonprinciples.org

Charterers

Oct 2020

SEA CARGO CHARTER

The Sea Cargo Charter was developed in an effort spearheaded by a diverse group of cargo owners and shipowners, intended as a transparent process for reporting emissions relating to chartering activities.

www.seacargocharter.org

Insurance

?

What these initiatives want to achieve

IUMI International Union of Marine Insurance

Assist and lead the industry towards achieving the IMO 2050 absolute target for halving CO_2 emissions

Incentivise vessel owners to invest in cleaner fleets

Through preferential lending rates (eventually)

Through generating client demand for clean vessels

Encourage owners to review the current condition and operation of their assets, and where feasible support effective upgrade their operations/vessels

Proactively support the quicker evolution of cleaner technologies and their application in shipping, via a generation of a market demand

The philosophy behind these initiatives

Carbon efficiency is the relationship between the CO_2 generated and the work produced in return

Both initiatives use **operational** Carbon Intensity Indicators for their assessment

Design Indicators

EEDI Energy Efficiency Design Index

$$\frac{\left(\prod_{j=1}^{n} f_j\right)\left(\sum_{i=1}^{nME} P_{ME(i)} \cdot C_{FME(i)} \cdot SFC_{ME(i)}\right) + (P_{AE} \cdot C_{FAE} \cdot SFC_{AE}*) + \left(\left(\prod_{j=1}^{n} f_j \cdot \sum_{i=1}^{nPTI} P_{PTI(i)}\right) - \sum_{i=1}^{neff} f_{eff(i)} \cdot P_{AEeff(i)}\right) C_{FAE} \cdot SFC_{AE}\right) - \left(\sum_{i=1}^{neff} f_{eff(i)} \cdot P_{eff(i)} \cdot C_{FME} \cdot SFC_{ME}**\right)}{f_i \cdot f_c \cdot f_j \cdot Capacity \cdot f_w \cdot V_{ref}}$$

EEXI Energy Efficiency Existing Ship Index

$$\frac{\left(\prod_{j=1}^{n} f_j\right)\left(\sum_{i=1}^{nME} P_{ME(i)} \cdot C_{FME(i)} \cdot SFC_{ME(i)}\right) + (P_{AE} \cdot C_{FAE} \cdot SFC_{AE}*) + \left(\left(\prod_{j=1}^{n} f_j \cdot \sum_{i=1}^{nPTI} P_{PTI(i)}\right) - \sum_{i=1}^{neff} f_{eff(i)} \cdot P_{AEeff(i)}\right) C_{FAE} \cdot SFC_{AE}\right) - \left(\sum_{i=1}^{neff} f_{eff(i)} \cdot P_{eff(i)} \cdot C_{FME} \cdot SFC_{ME}**\right)}{f_i \cdot f_c \cdot f_j \cdot Capacity \cdot f_w \cdot V_{ref} \cdot f_w}$$

Operational Indicators

AER Annual Efficiency Ratio

$$AER = \frac{\sum_i C_i}{\sum_i dwtD_i}$$

EEOI Energy Efficiency Operational Indicator

$$EEOI = \frac{\sum_j FC_j \times C_{Fj}}{m_{cargo} \times D}$$

Both initiatives operate on 4 principles

Assessment of Climate Alignment

Annual assessment of climate alignment of investment portfolios/chartering activities based on set rules

Accountability

The assessment will be performed on reliable data, collected for the IMO DCS* and checked for compliance by the ROs/noon reports**

Enforcement

Compliance with the Poseidon Principles /Sea Cargo Charter, ensured contractually ***

Transparency

Signatories will publish their alignment score annually, in line with the technical guidance

* IMO DCS: A data collection and reporting system for ship fuel consumption data as set in the Ship Energy Efficiency Management Plan, SEEMP. Data is subsequently confirmed by Flag/Recognized Organization (RO)

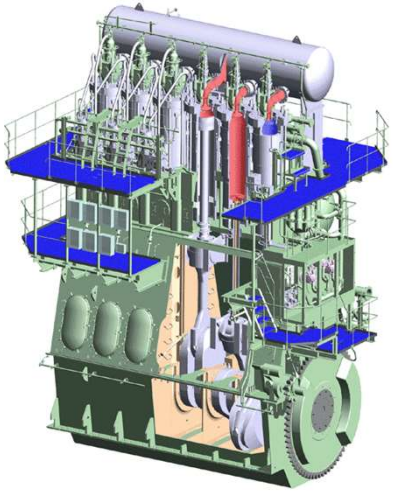
** Noon Report: Daily submitted data record prepared from the vessel's chief engineer to the owner/charterer

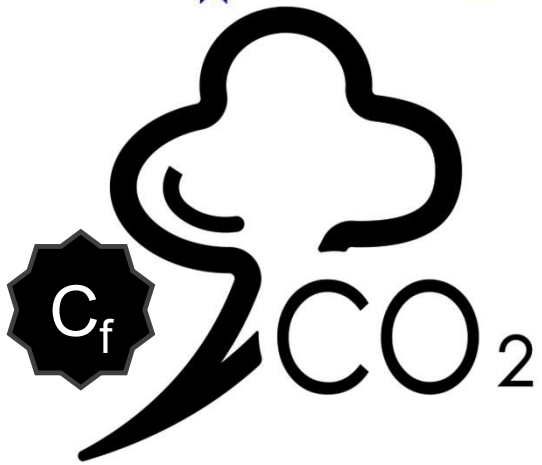
*** Poseidon Principles on best endeavours – "it is recommended that the covenant clause be included in new loan agreements, but it is not compulsory for Signatories"

Carbon Efficiency for the Poseidon Principles

IUMI International Union of Marine Insurance

Calculated on the following principle





LOG THESE PARAMETERS FOR 1 YEAR

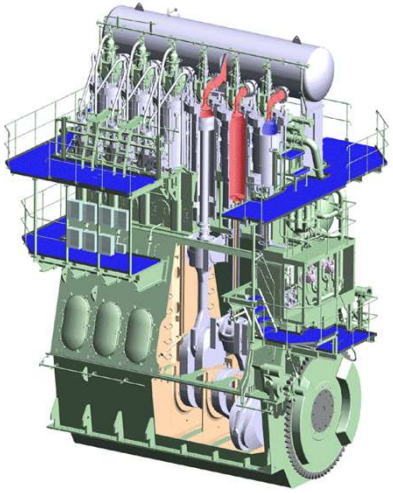
$$AER = \frac{\sum_i C_i}{\sum_i dwtD_i}$$

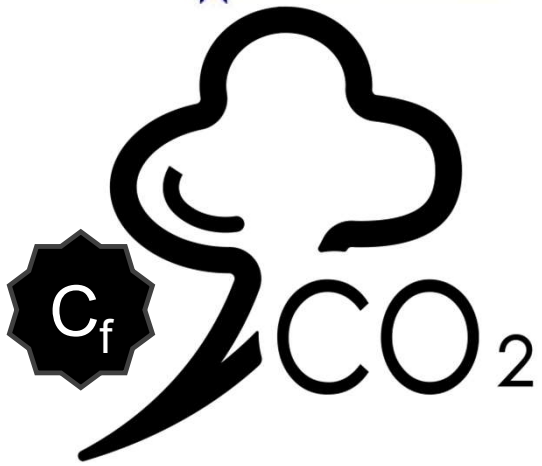
All information required is within IMO-DCS reporting

Carbon Efficiency for the Sea Cargo Charter

IUMI International Union of Marine Insurance

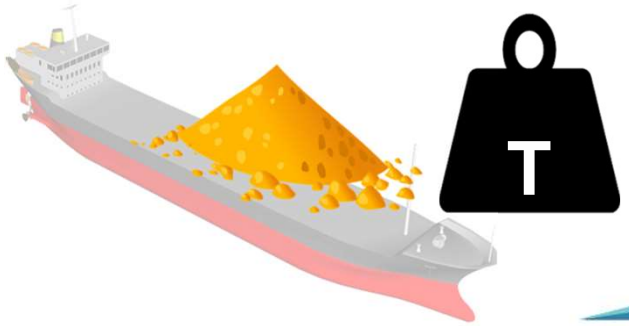
Calculated on the following principle





LOG THESE PARAMETERS FOR EVERY TRIP

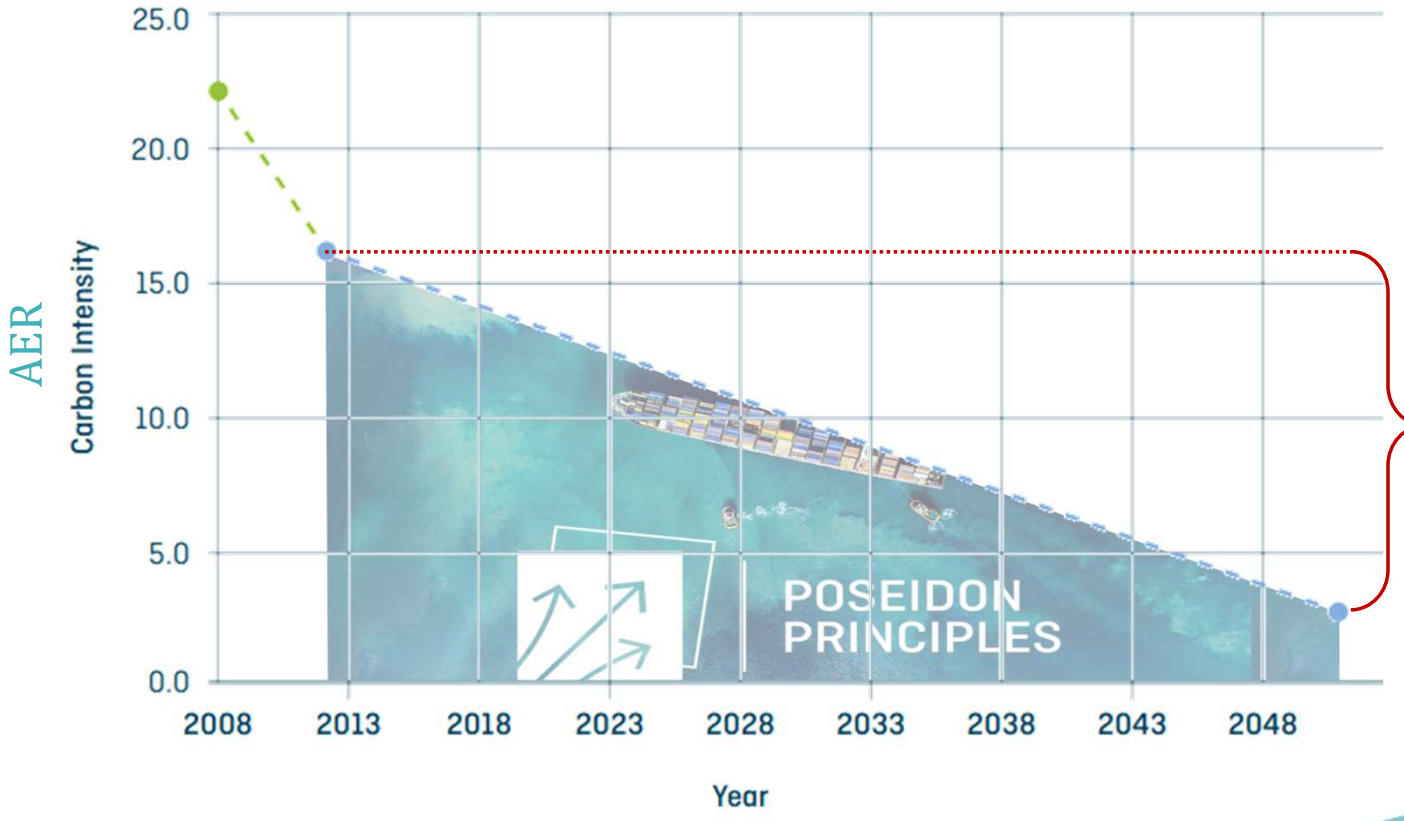
$$\mathrm{EEOI} = \frac{\sum_j FC_j \times C_{Fj}}{m_{cargo} \times D}$$

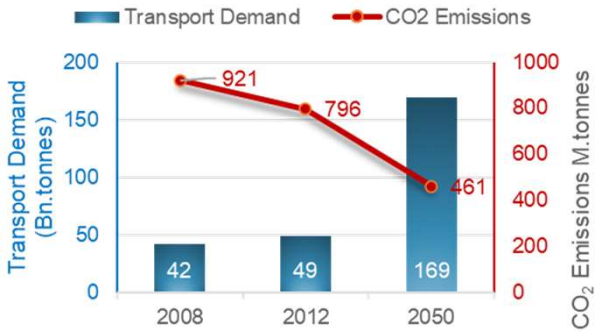


Adjustment to Carbon Intensity required

IUMI International Union of Marine Insurance

Are we looking to reduce these CIIs by 50% to achieve IMO targets?

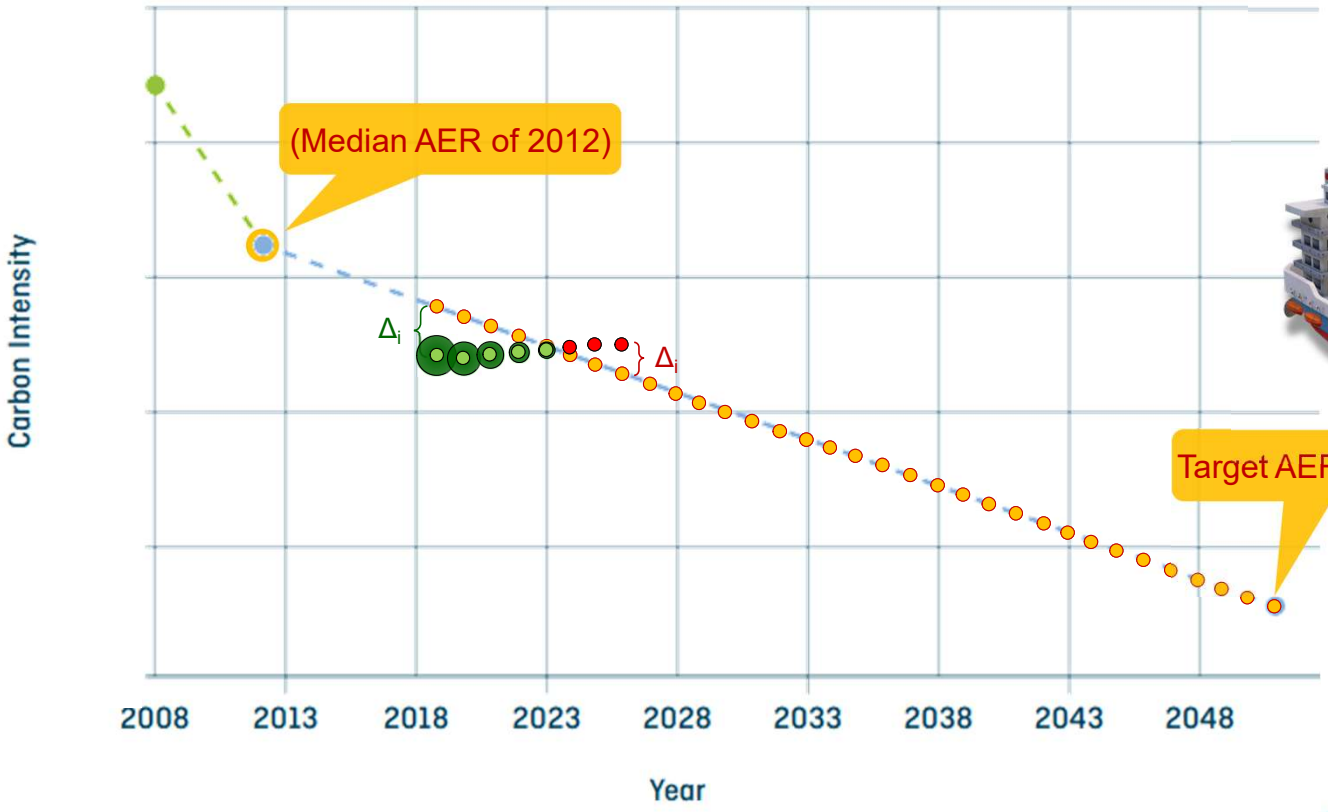




Much steeper reduction

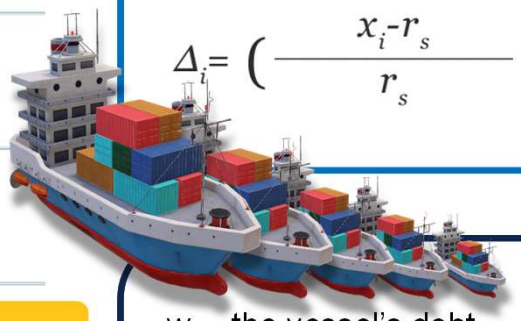
Assessment process

Individual vessel efficiency contribution at portfolio level



$$AER = \frac{\sum_i C_i}{\sum_i dwtD_i}$$

$$\Delta_i = \left(\frac{x_i - r_s}{r_s}\right) 100$$



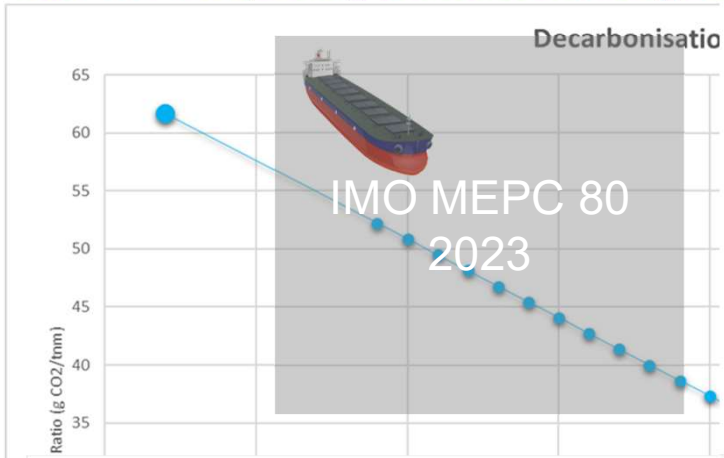
w_i – the vessel's debt outstanding as a share of the total debt held by institution

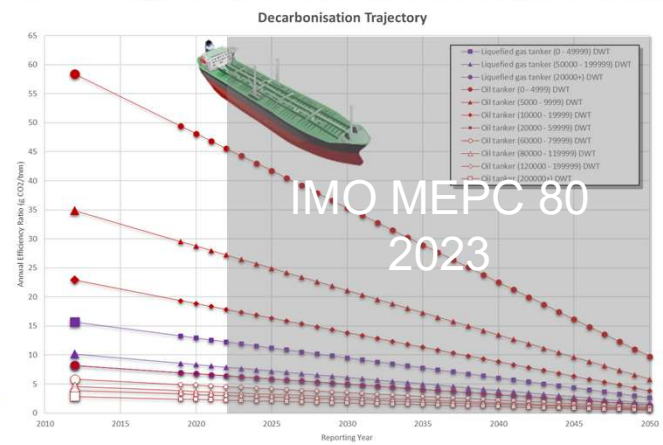
$$\Delta_p = \sum_{i=1}^{N} w_i \Delta_i$$

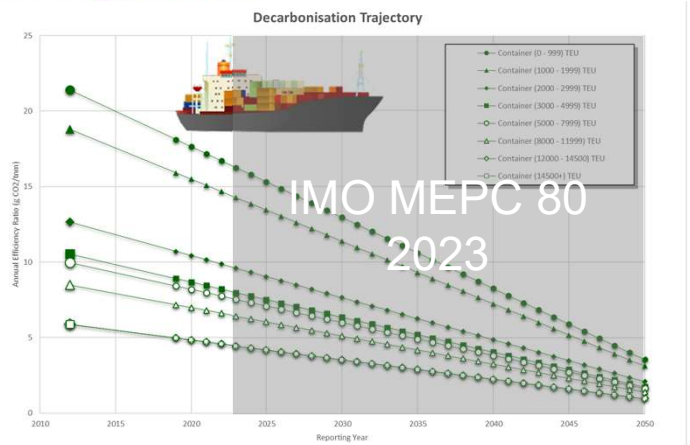
The reduction trajectories

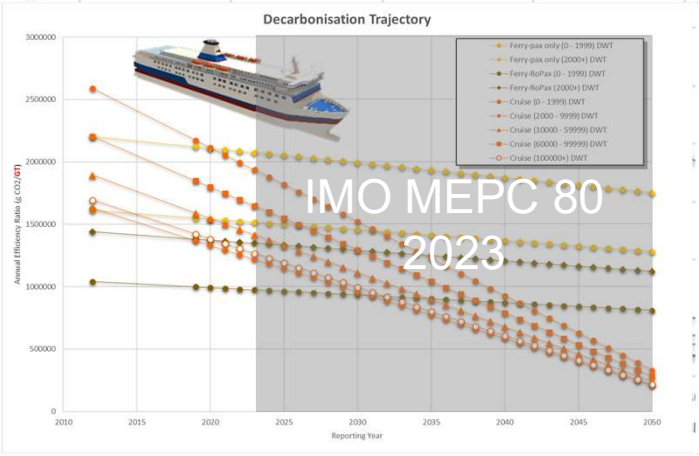
IUMI International Union of Marine Insurance

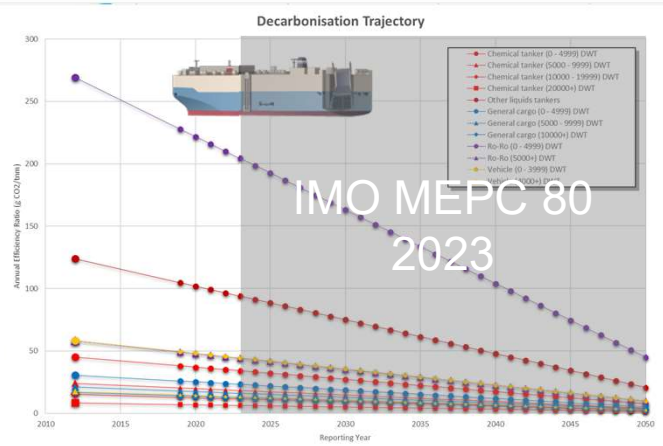
Are we comparing performance against a single carbon efficiency reduction target line?











47 Different Target lines

21 Different Target lines

Summary of main steps:

Portfolio

Annual Activity

Vessel/trip Level Assessment

The key driving force for their implementation is:

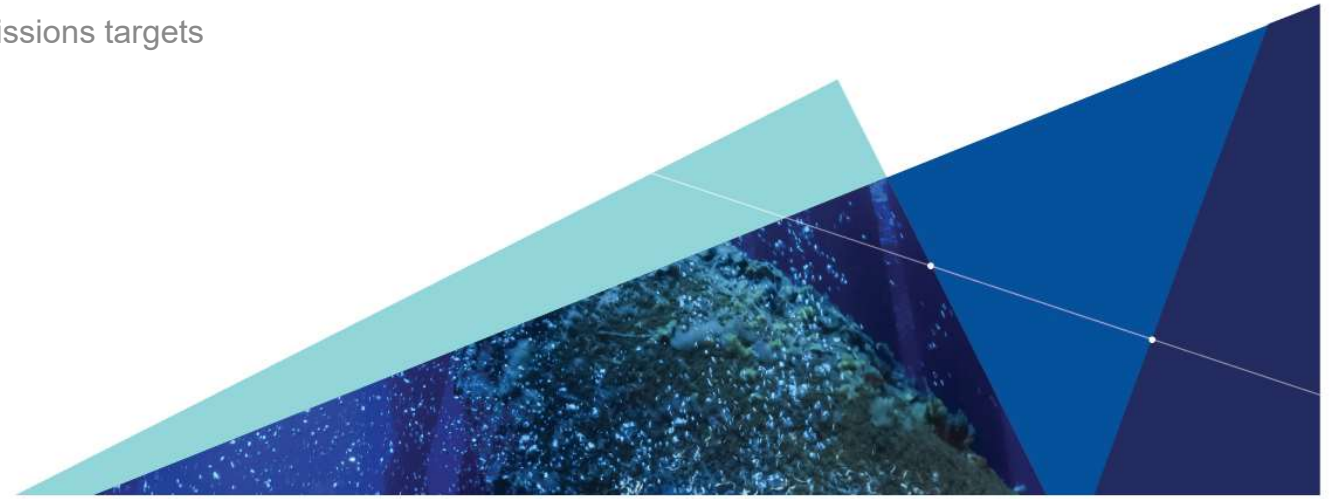
Currently installed technology cannot take us very far in terms of satisfying emissions targets

Attractive financing to new, green propulsion and energy technologies

Charter market demand generated for carbon free vessels

Our involvement and insights

How does the industry do against the emissions targets



Software solution

Upload:
1. IMO-DCS form
2. SoC from RO

Process:
1. IMO#
2. Fuel Type
3. Fuel Consumption
4. Distance Travelled
5. DWT

Process:
1. IMO#s
2. Debt Outstanding

Annually Upload:
1. Portfolio IMO#
2. Debt
3. Client Name
4. Client Contact

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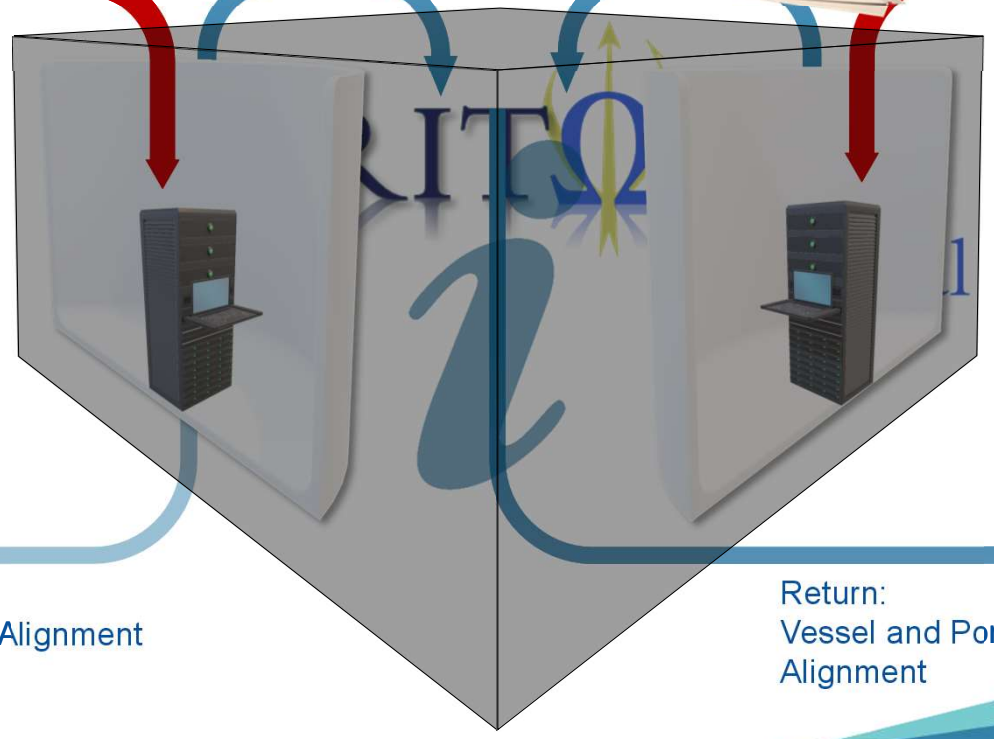
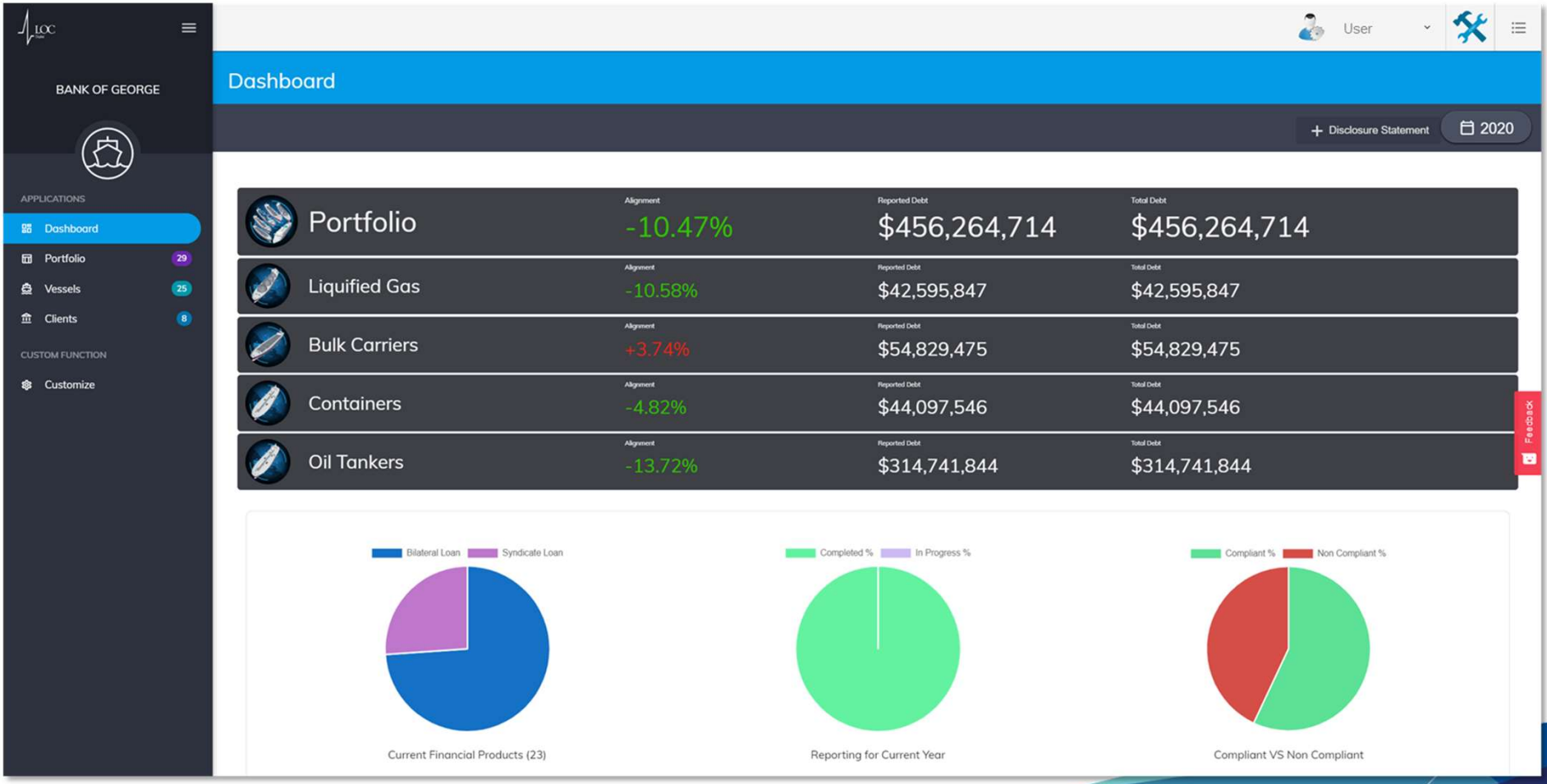


Return:
Vessel Climate Alignment

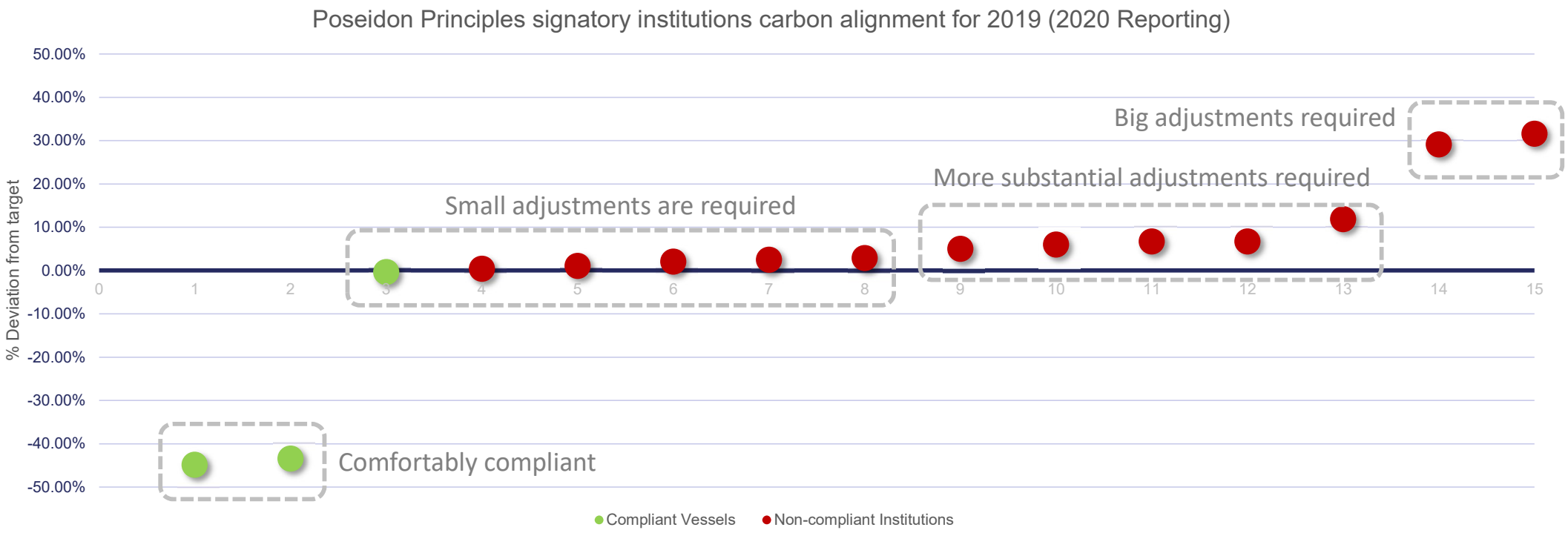
Return:
Vessel and Portfolio Climate
Alignment

POSEIDON
PRINCIPLES
Secretariat

What Triton looks like

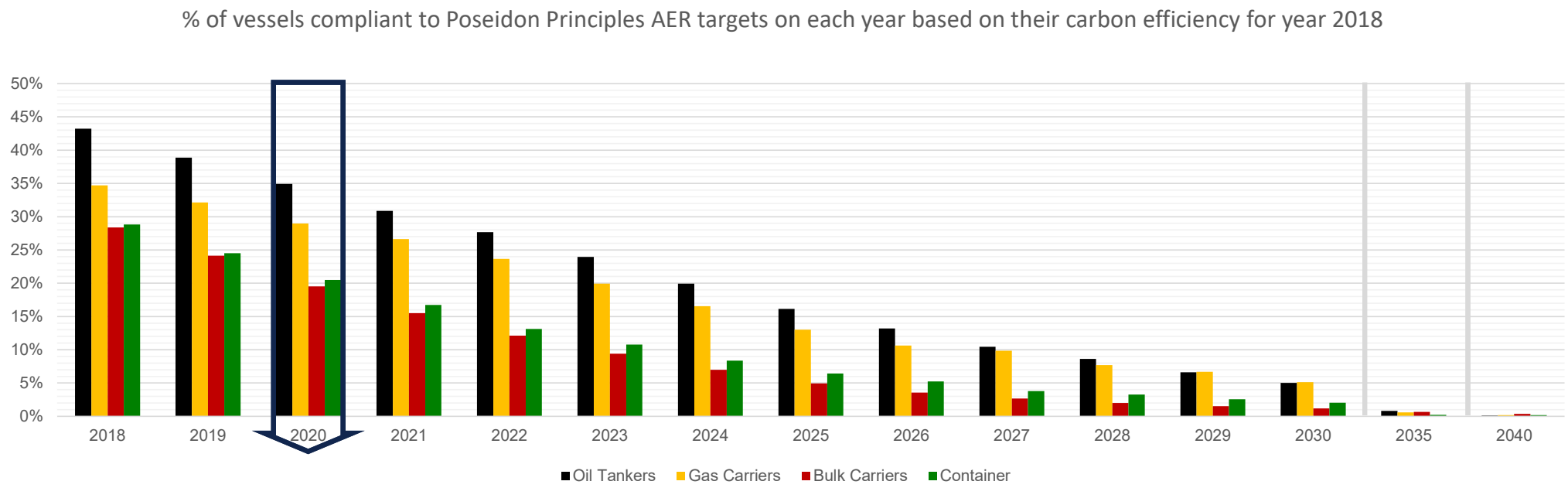


Results of first Poseidon Principles Assessment



Did this result take signatory institutions by surprise?

The 2018 outlook on four vessel types



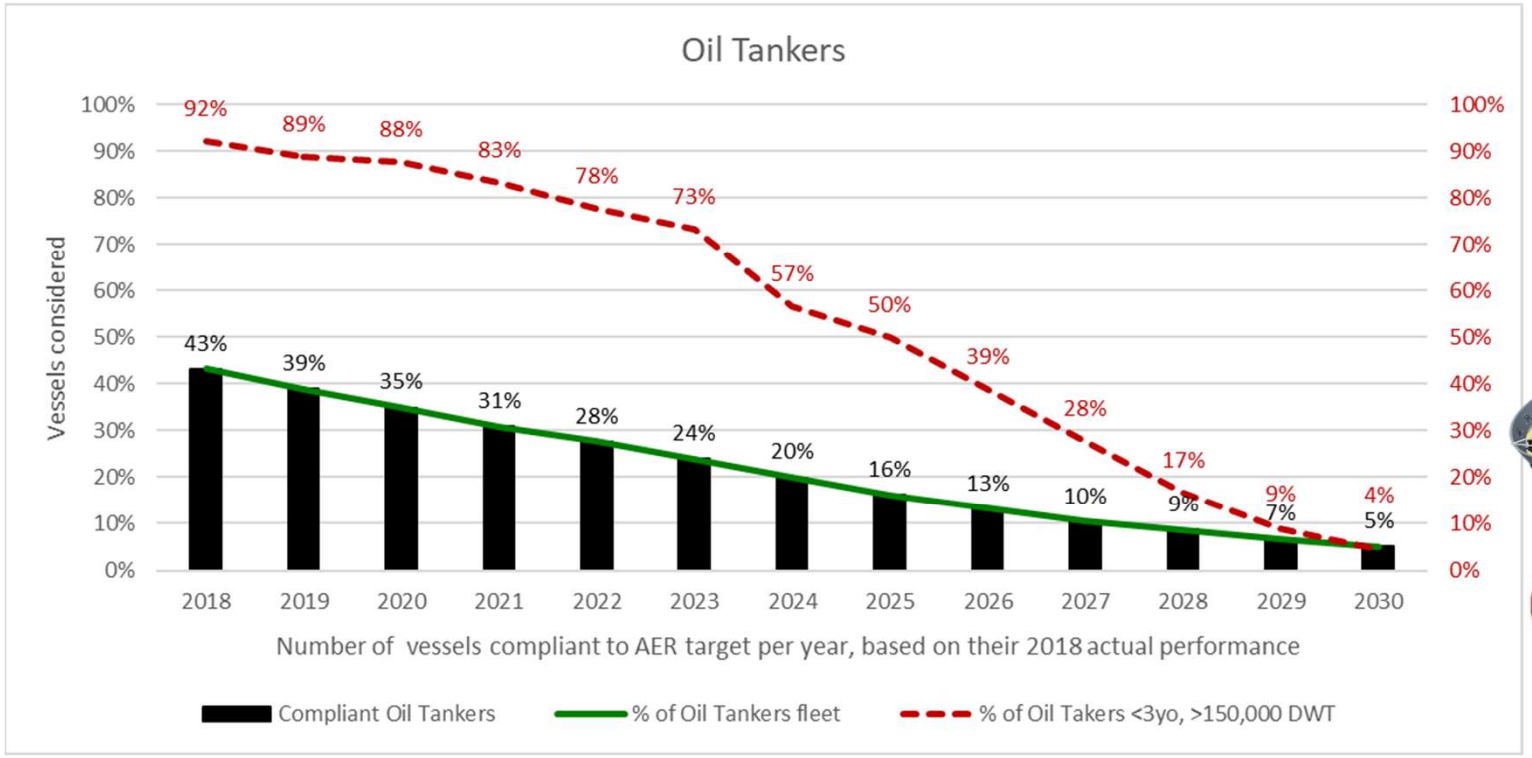
The 2018 fleet, unless upgrades are made, can barely remain compliant until the end of this decade

Not more than 35% of the vessels of either group appear to be compliant at the moment

Specific vessel profiles

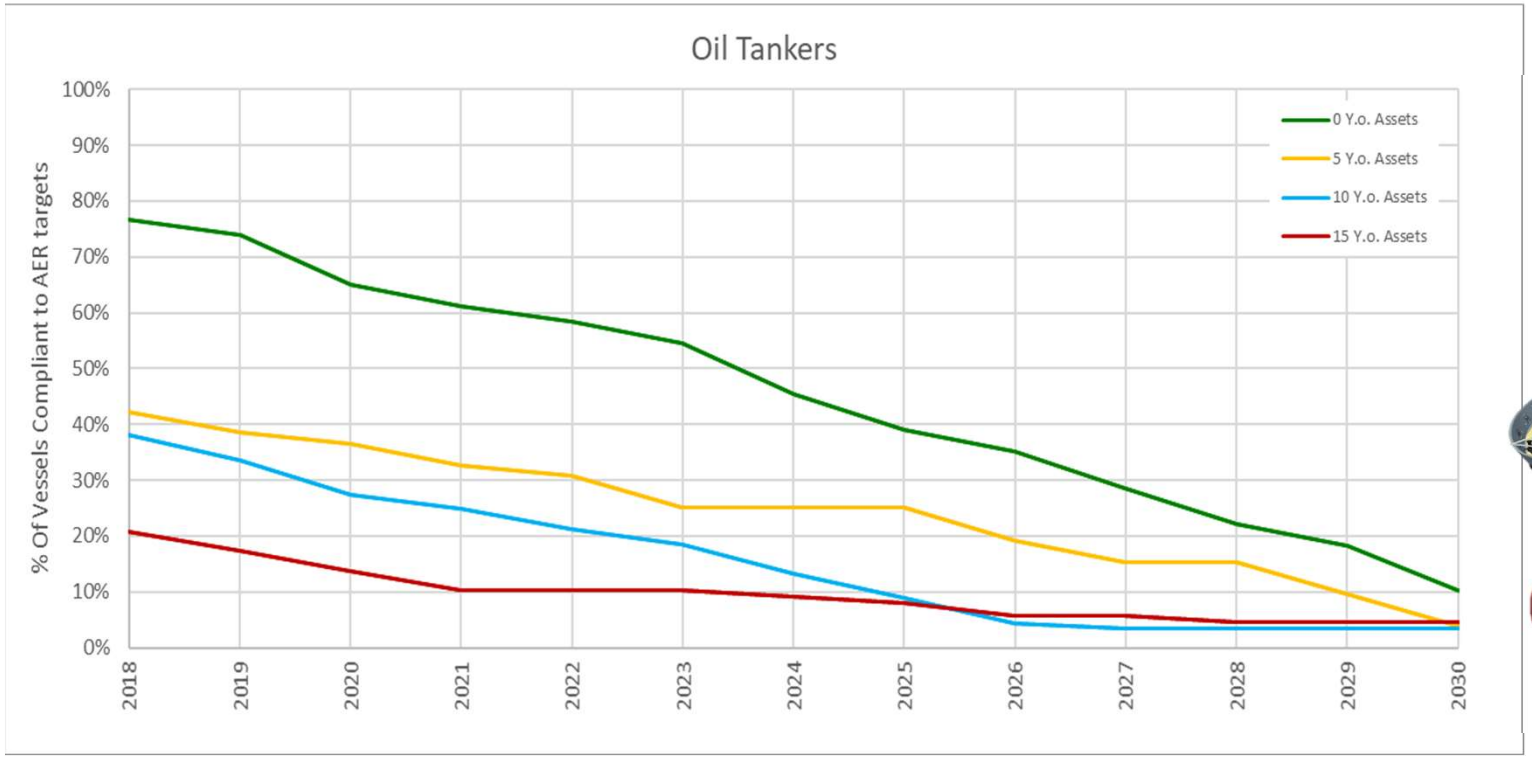
IUMI International Union of Marine Insurance

Somebody looking to acquire a relatively new Capesize Oil Tanker, would find:



Specific vessel profiles

Compliance expectancy varies with asset age and specifications



*Asset ages in years, as of 31/12/2018

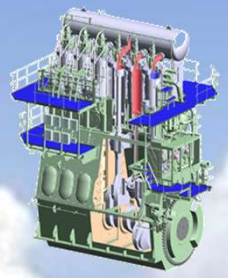
How can carbon performance be improved

IUMI International Union of Marine Insurance

By reducing fuel consumption

Energy saving devices

Engine power limitation



Conversion to LNG

LNG

CO_2

Increase DWT

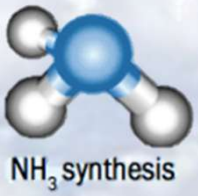
Propulsion aids

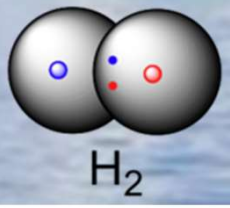
Carbon free* shipping

*No CO2 emissions from the vessel, not looking at the supply chain

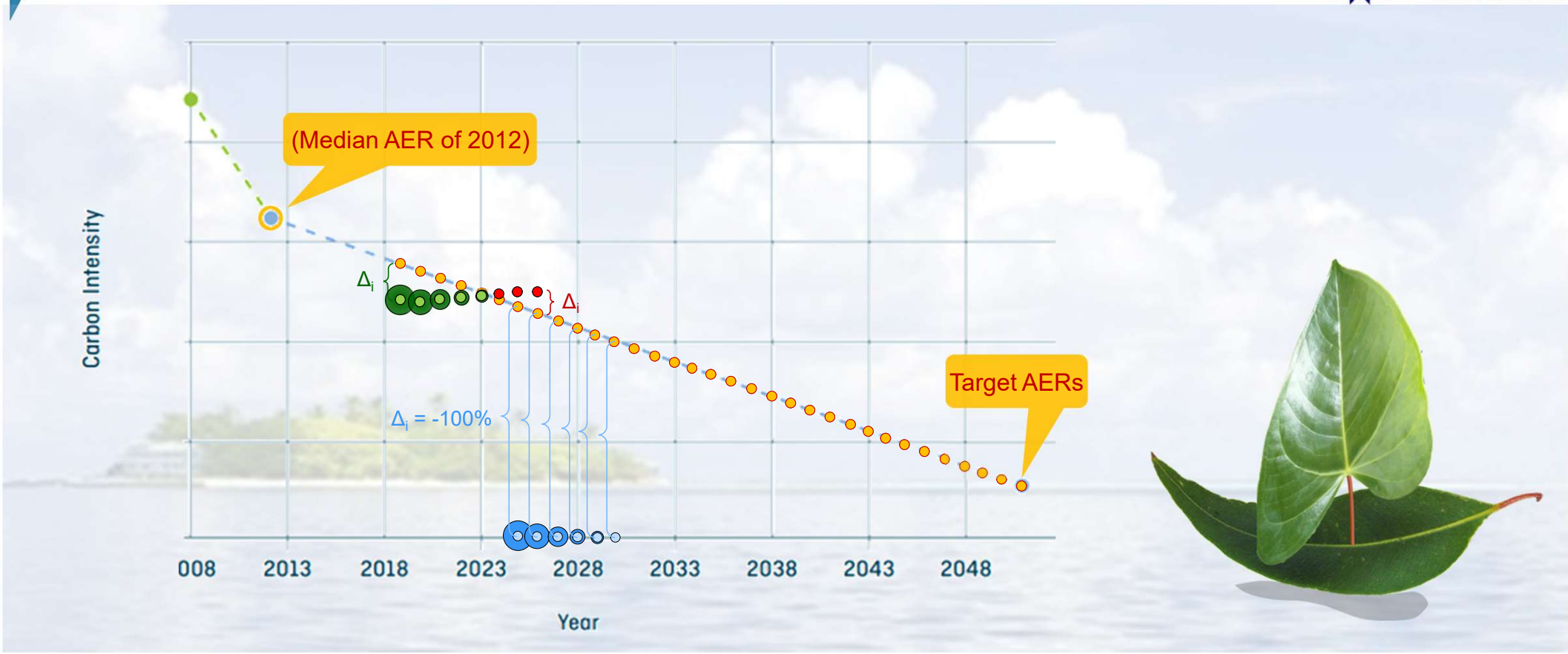
Alternative fuel power units

Littoral/regional	Seagoing	
Electricity	Bio-mass derived fuels	Synthetic fuels
Hydrogen from CH_3	Nuclear power (?)	





The effect of carbon free vessels



The effect of alternative power vessels

The introduction of one carbon free vessel has the potential to mitigate the effect of a number of vessels not achieving targets

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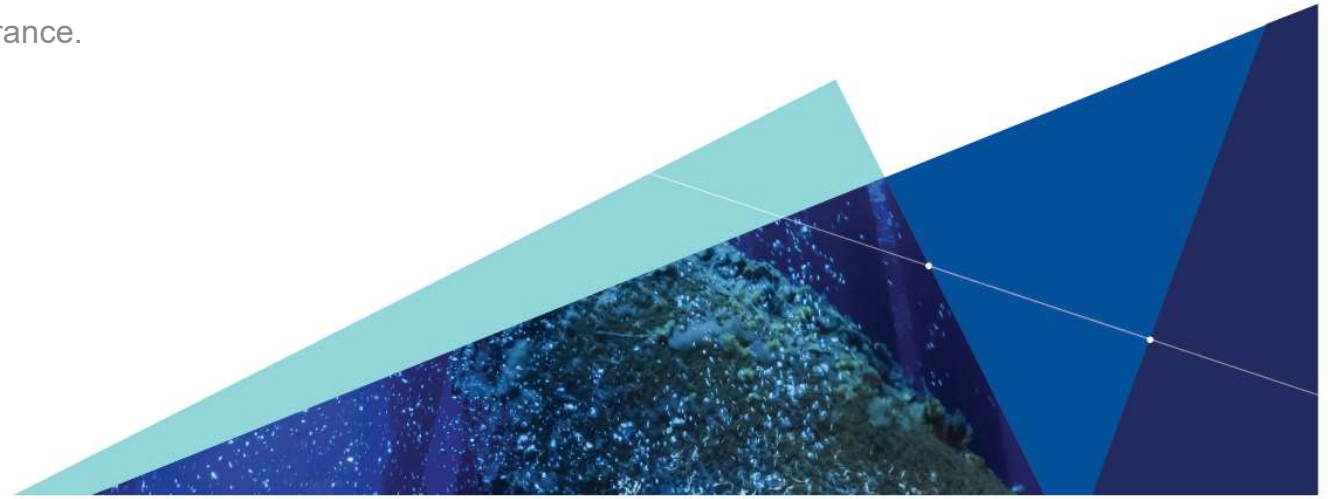
The insurance industry

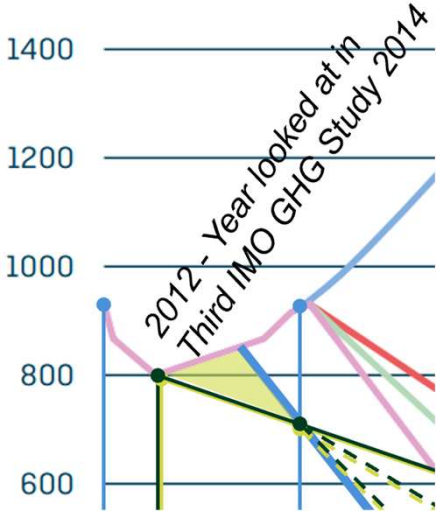
The influence of carbon initiatives to insurance.



Effects on P&I Insurance

IUMI International Union of Marine Insurance

The enforcement of any new IMO regulation for the reduction of greenhouse gasses will inevitably become associated with the achievement of targets on a vessel basis and associated penalties for given for non-compliance



As the regulation is enforced by different state authorities and is of environmental context, there may be further implications. UK EU-MRV enforcement: "a Company could be made criminally liable"

- A Poseidon Principles assessment can be an invaluable tool in the hands of the P&I insurer, to understand the risk associated with the assets they underwrite
- The outcome can be used to single out high risk assets up to 2-3 years ahead of IMO GHG regulation, and timely communicate with members to mitigate risks

H&M Insurance

IUMI International Union of Marine Insurance

Multiple new propulsion tech entering the market in a short period of time

Insurers will have to find a way to accommodate this change and keep underwriting
A way to address it, would be to develop the “Insurer’s Poseidon Principles” in close collaboration with the Charterers and Financiers

And in fact, insurers are developing their own

Logic suggests it will be very similar to the existing initiatives

Measure work on the basis of DWT

To weight or not to weight your CII deviation?

Weight performance against what other parameter?

Asset focussed or Owner focussed?

We look forward to discovering more about this initiative as it develops

It is never too early to start looking at vessels in your books

What we can do for you

Support ahead of signing up	Support to signatories	
We can help you pre-assess the assets in your books to understand how you would perform if you were to sign up to the initiative, and provide insights towards managing it	Support you in the process and execution of the annual assessments you will have to perform as a signatory	Support you with the relevant advisory towards improving your annual performance to stay compliant to the initiative targets, and in your liaison with stakeholders

Thank you

Contact: G.Savvopoulos@loc-group.com