International Marine Contractors Association

Improving performance in the marine contracting industry

Assessing the Carbon Intensity of the offshore and marine contracting sector

Date: 14 February 2022 starting at 1100hrs GMT

There will be opportunity for Q&A at the end of the presentations – please submit questions at any time under the Q&A section on your screen

IMCA®

Welcome

- This is a webinar
- The sound works one way only
  - —from presenters to you
- Written questions are encouraged
  - —Q&A box is monitored
- Today's Speakers and Members of the MPRA Committee are here to answer your questions
- A recording of today's webinar will be shared with you
- Competition Law

Industry Events

22-24 February **Subsea Expo, Aberdeen**

- Event supporter plus exhibitor with IMCA open pavilion stand

3 March **UK's first Crew Transfer Vessel Seminar**

- A one-day workshop on the critical issues in the CTV sector

15-17 March **Oceanology, London**

- Event supporter of this Conference & Exhibition

12-14 April **MCEDD, London**

- Event supporter and 3 Speakers in Conference

26-28 April **IPF, Atlantic City**

- IMCA and G+ exhibiting at this renewables event

Full details visit events section at imca-int.com

Email us
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imca-int.com

IMCA Events

31 May – 1 June

IMCA DP Conference

Key focus on technical and operational matters relating to DP.

This event will be of interest to those involved in both offshore renewable energy and offshore oil & gas operations.

This two-day seminar provides an opportunity for IMCA members and industry colleagues to participate in an industry forum where attendees will hear from experts in Dynamic Positioning and have the opportunity to participate in Q&A sessions and workshops helping to formulate the work programme for IMCA's Dynamic Positioning Committee.

Outputs from this conference will influence and shape this area of our industry

Dynamic Positioning is in our DNA as our heritage goes back to 1989 in this area.

Full details visit events section at imca-int.com

Email us events@imca-int.com

Registration opening soon

Today's speakers

Margaret Fitzgerald

IMCA

Head of Legal & Regulatory Affairs

Dr Shuang ZHANG

Dalian Maritime University

Associate Professor Shipping Development Research Institute

Tore Longva

DNV

Principal Consultant

Q&A Sessions

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Open Forum with MPRA Committee

Remko Kloos
Global Director Fleet Services
Fugro

Chair
IMCA MPRA Committee

Peter McCombie
Integrity & Certification Engineer, Deputy DPA, Assistant CSO
TechnipFMC

IMCA MPRA Committee

Eugène van Dodeweerd
Director Fleet Management Offshore
Boskalis

IMCA MPRA Committee

Open Q&A

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Margaret Fitzgerald

IMCA

Margaret Fitzgerald

Head of Legal & Regulatory Affairs

- Margaret is a qualified maritime lawyer and chemical scientist who holds Chartered status with the Royal Society of Chemistry (CChem) and Chartered status with the Institute of Occupational Safety and Health (CMIOSH).
- Margaret has over 20 years' experience in shipping. She previously worked for the IMO Secretariat, leading on the development of the International Maritime Dangerous Goods Code and related regulations on the carriage of hazardous chemicals and noxious and polluting substances, including the HNS Convention.
- Her experience also includes working for a member of the International Association of Classification Societies as a senior safety and environmental specialist, and as an expert adviser on several high-profile maritime incidents.

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International Marine Contractors Association

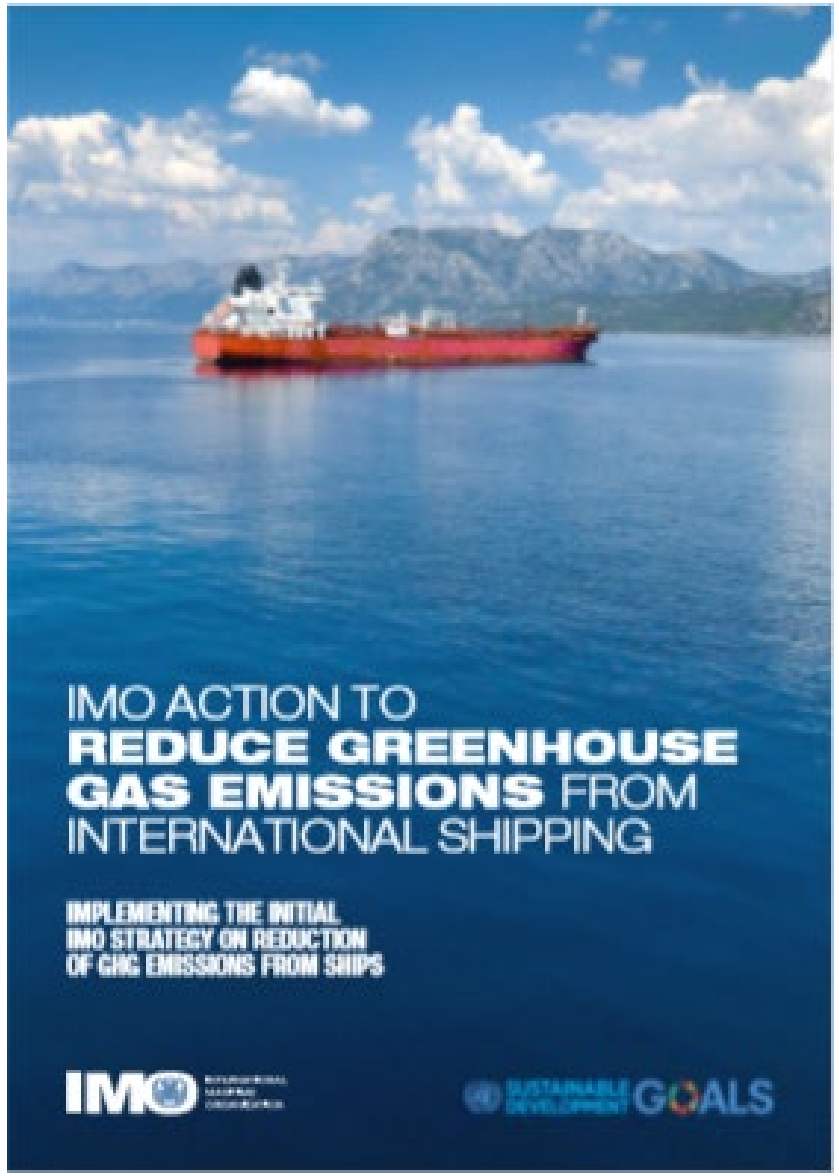
Improving performance in the marine contracting industry

Assessing the Carbon Intensity of the offshore and marine contracting sector

Margaret Fitzgerald

Head of Legal & Regulatory Affairs

IMO's Initial Green House Gas Strategy



Carbon intensity of international shipping to decline to reduce CO_2 emissions per "**transport work"**, as an average across international shipping, by at least 40% by 2030 and 70% by 2050 compared to 2008 levels

Green House Gas emissions from international shipping to peak as soon as possible and then decline

This requires efficiency improvements beyond Business as Usual	Will require ships to change operational practices and/or technical specifications	Measures should have an impact on *operational efficiency* from 2023 onwards

‘Transport work’ and consideration of the offshore sector

IMO INTERNATIONAL MARITIME ORGANIZATION

E

MARINE ENVIRONMENT PROTECTION COMMITTEE
74th session
Agenda item 6

MEPC 74/6
8 March 2019
Original: ENGLISH

FURTHER TECHNICAL AND OPERATIONAL MEASURES FOR ENHANCING THE ENERGY EFFICIENCY OF INTERNATIONAL SHIPPING

Transport work for offshore and marine contracting vessels

Submitted by the Russian Federation and IMCA

SUMMARY

Executive summary: This document provides two potential proxies against which to measure energy efficiency of offshore and marine contracting vessels

Strategic direction, if applicable: 3

Output: 3.7

- While the concept of "transport work" is appropriate for vessels whose main purpose is to carry passengers and/or cargo between ports of departure and destination for commercial purposes.

- It is not suitable for "work/service vessels", such as offshore and marine contracting vessels, which are designed and primarily used for servicing/developing offshore industrial and marine construction activities or for the public sector (salvage, rescue, ports, channels, energy, breakwaters, etc.).

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‘Transport work’ and consideration of the offshore sector

Instead of ‘Transport Work’, IMCA proposed two possible proxies to be used by IMO as a Carbon Intensity Indicator for our sector:

- **Proxy A** – based on yearly energy consumption
  - Installed rated power
  - Yearly running hours
  - Total kg CO_2 emitted per year, calculated on the basis of fuel consumed per year and applicable conversion factors for each type of fuel
- **Proxy B** – based on effective (operational) utilisation time of the vessel
  - Total hours underway
  - Total kg CO_2 emitted per year, calculated on the basis of fuel consumed per year and applicable conversion factors for each type of fuel

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‘Transport work’ and consideration of the offshore sector

- In March 2021 IMO’s Intersessional Working Group on Green House Gases considered IMCA’s proposal and decided that data, in support of each of the proxies is needed, before it is able to agree what the proxy should be.

.1 in addition to the IMO DCS data, offshore and marine contracting vessels should collect "engine running hours and installed power, for each engine" for trial on a voluntary basis;

.2 using that data, offshore and marine contracting vessels should calculate both proxies A and B and report them to the IMO; and

.3 the IMO should develop an anonymized dataset of proxies A and B for analysis and consideration by the IMO Member States who will decide which of the two proxies, if any, should apply.

Applies to vessels of 5,000 GT and above

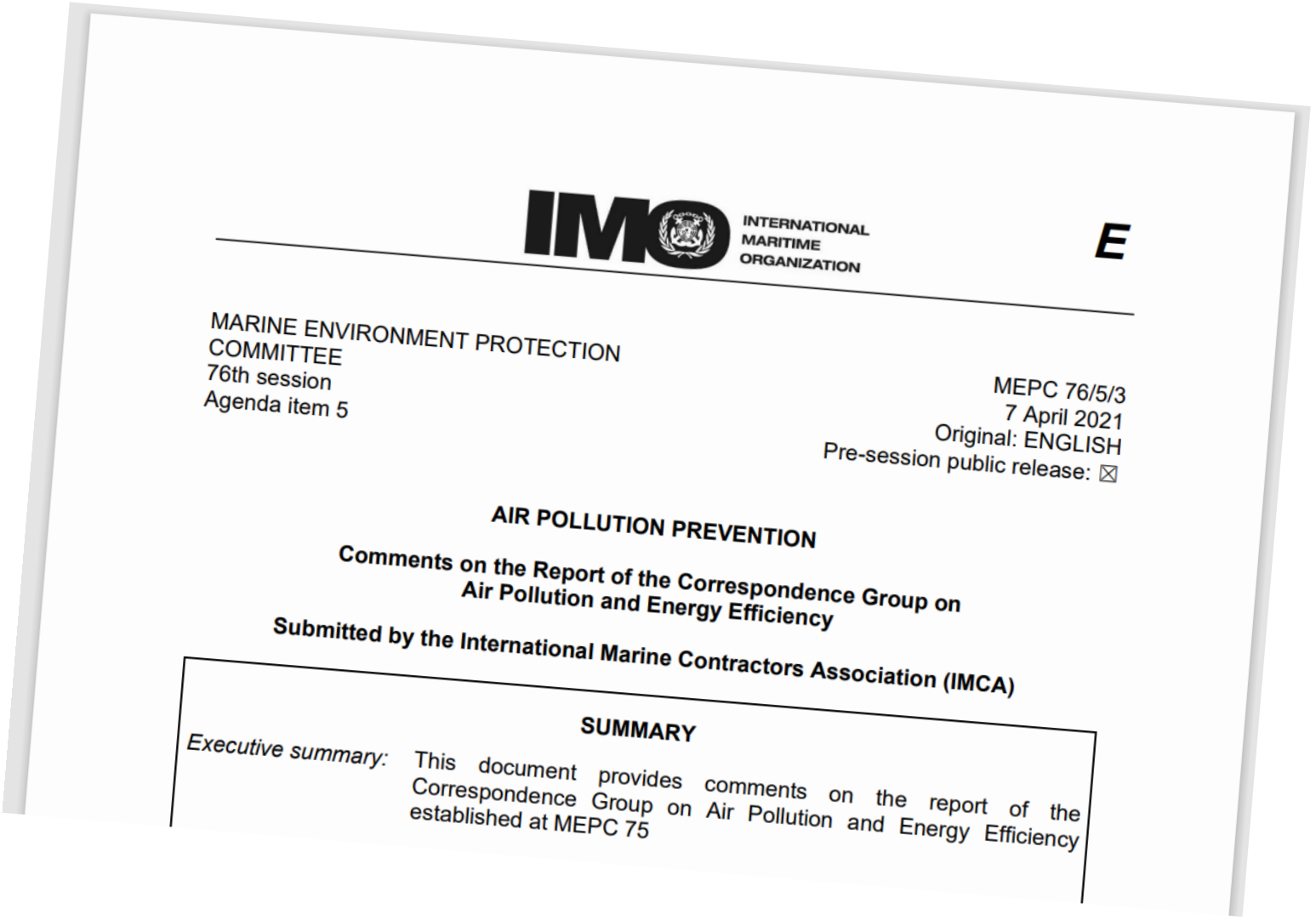
Fuel consumption data to be reported to IMO

- Offshore and marine contracting sector instructed, in addition, to collect Fuel consumption and

- Engine running hours → For EACH ENGINE
  Installed power → For EACH ENGINE
- Calculate Proxy A

- Hours underway
- Calculate Proxy B

IMCA Submission to MEPC 76



INTERNATIONAL MARITIME ORGANIZATION

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MARINE ENVIRONMENT PROTECTION COMMITTEE
76th session
Agenda item 5

MEPC 76/5/3
7 April 2021
Original: ENGLISH
Pre-session public release: ☒

AIR POLLUTION PREVENTION

Comments on the Report of the Correspondence Group on Air Pollution and Energy Efficiency

Submitted by the International Marine Contractors Association (IMCA)

SUMMARY

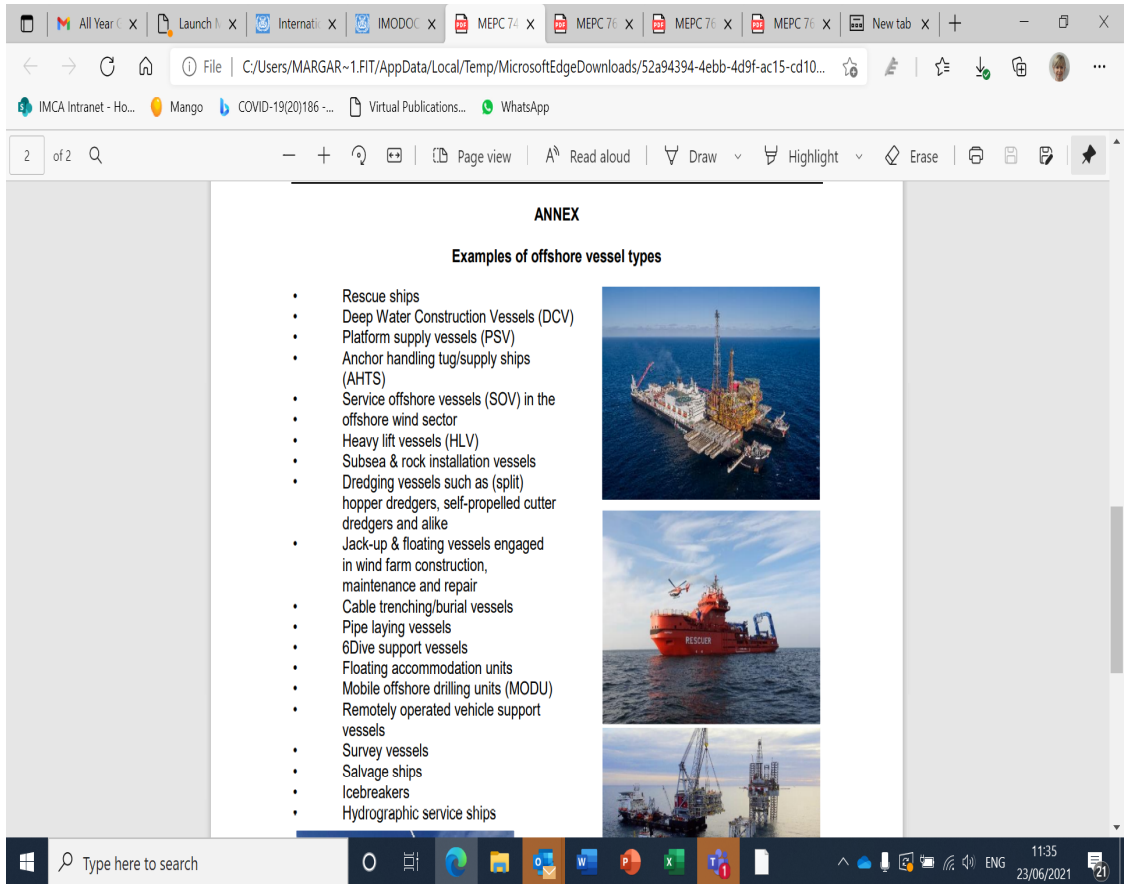
Executive summary: This document provides comments on the report of the Correspondence Group on Air Pollution and Energy Efficiency established at MEPC 75

IMCA Submission to MEPC 76

In its paper IMCA expressed concern about the proposed data collection process, warning that:

"care is needed to ensure that voluntary submission of data is carefully managed in a clear process to minimize the possibility of selection bias and inadequate quality control leading to a distorted impression when analysing the different proxies".

IMCA Submission to MEPC 76



ANNEX

Examples of offshore vessel types

- Rescue ships
- Deep Water Construction Vessels (DCV)
- Platform supply vessels (PSV)
- Anchor handling tug/supply ships (AHTS)
- Service offshore vessels (SOV) in the offshore wind sector
- Heavy lift vessels (HLV)
- Subsea & rock installation vessels
- Dredging vessels such as (split) hopper dredgers, self-propelled cutter dredgers and alike
- Jack-up & floating vessels engaged in wind farm construction, maintenance and repair
- Cable trenching/burial vessels
- Pipe laying vessels
- 6Dive support vessels
- Floating accommodation units
- Mobile offshore drilling units (MODU)
- Remotely operated vehicle support vessels
- Survey vessels
- Salvage ships
- Icebreakers
- Hydrographic service ships

- IMCA drew attention to its information paper which had been submitted to MEPC 74 in which we highlighted the fact that more than 20 vessel types fall within the scope of 'offshore and marine contracting vessels'
- We advised that any decision on a proxy needs to be based on sufficient data representative of all these vessel types
- IMCA proposed it was best placed to oversee the collection of data from our members to ensure that there was sufficient data representative of all vessel types within our sector available to IMO before any final decision is taken

Outcome of MEPC 76

On the basis of our proposal, IMCA has been granted permission to collect and submit data on CO_2 emissions to IMO on behalf of its' members

IMCA has used its internal database to identify those vessels within the membership which fall within the scope of this data collection requirement

We have also asked Clarksons to confirm the number of offshore and marine contracting vessels which fall within the scope of the data collection requirement

IMCA continues to collect data for 2019, 2020 and is now collecting data for 2021

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Vessel Fuel Consumption Data for 2020

CONFIDENTIAL - COMMERCIALLY SENSITIVE

A separate copy of this spreadsheet should be submitted for each vessel to fueldata@imca-int.com

Access is limited to authorised IMCA secretariat staff only, with only anonymised aggregate data published

Submission Summary

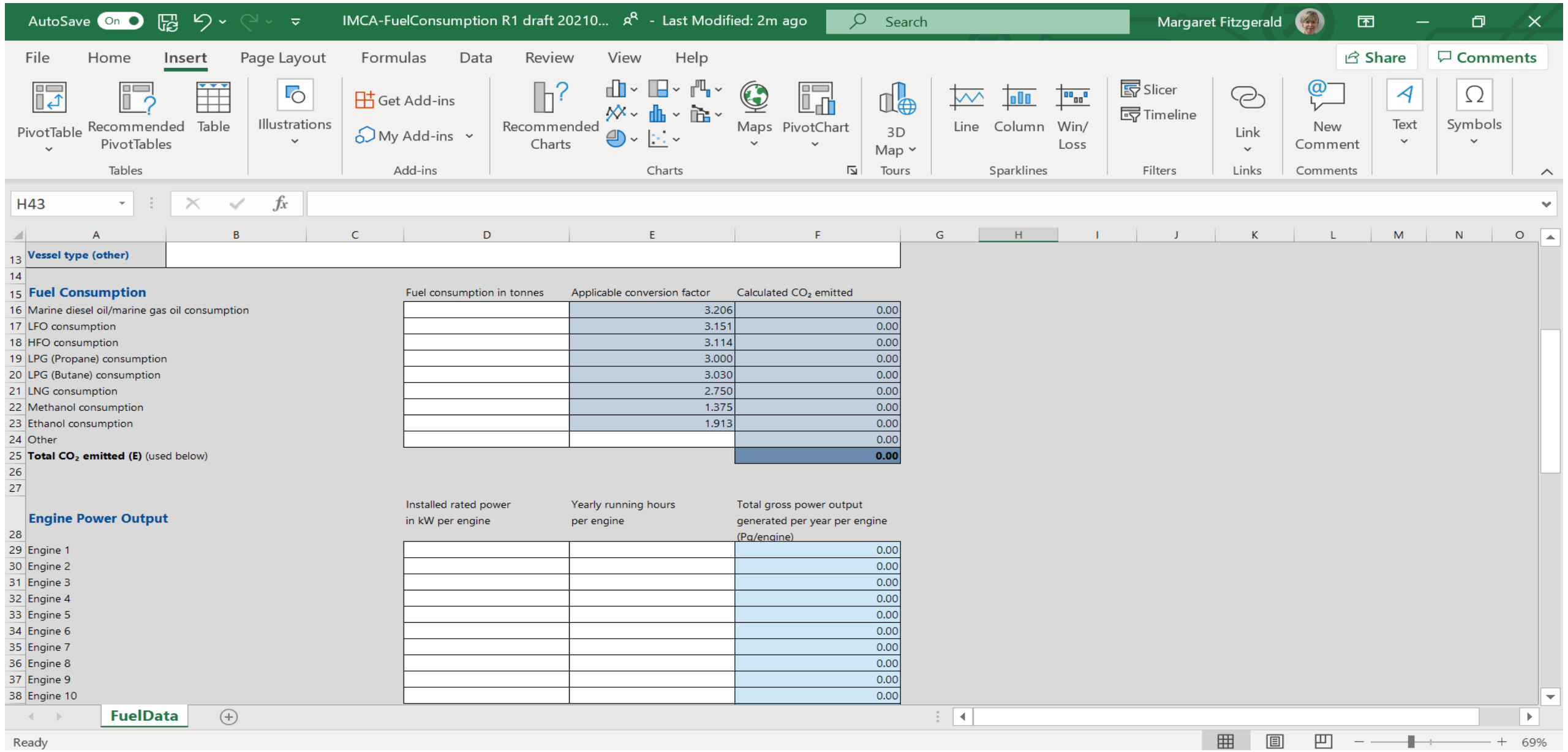
- Identifying information is not used in any reports, but may be useful in case of a query regarding your submission
- Vessel type is used for classification of aggregate data

Company name	
Submitted by (name)	
Email address	
Vessel name	
Vessel type	
Vessel type (other)	

Fuel Consumption

	Fuel consumption in tonnes	Applicable conversion factor	Calculated CO_2 emitted
Marine diesel oil/marine gas oil consumption		3.206	0.00
LFO consumption		3.151	0.00
HFO consumption		3.114	0.00
LPG (Propane) consumption		3.000	0.00
LPG (Butane) consumption		3.030	0.00
LNG consumption		2.750	0.00

FuelData
Ready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H43
Vessel type (other)
Fuel Consumption
Fuel consumption in tonnes
Applicable conversion factor
Calculated CO_2 emitted
Marine diesel oil/marine gas oil consumption 3.206 0.00
LFO consumption 3.151 0.00
HFO consumption 3.114 0.00
LPG (Propane) consumption 3.000 0.00
LPG (Butane) consumption 3.030 0.00
LNG consumption 2.750 0.00
Methanol consumption 1.375 0.00
Ethanol consumption 1.913 0.00
Other 0.00
Total CO_2 emitted (E) (used below) 0.00
Engine Power Output
Installed rated power in kW per engine
Yearly running hours per engine
Total gross power output generated per year per engine (Pg/engine)
Engine 1 0.00
Engine 2 0.00
Engine 3 0.00
Engine 4 0.00
Engine 5 0.00
Engine 6 0.00
Engine 7 0.00
Engine 8 0.00
Engine 9 0.00
Engine 10 0.00
FuelData
Ready
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Activity

Total hours underway		

Calculations

Proxy A	E - Total kg CO_2 emitted per year (calculated above, all fuels with conversion factors)	0.00
	Pg - Total calculated gross kWh generated per year (calculated above, all engines)	0.00
	R value for Proxy A	#DIV/0!
Proxy B	E - Total kg CO_2 emitted per year (calculated above, all fuels with conversion factors)	0.00
	U - Total hours underway	0.00
	R value for Proxy B	#DIV/0!

Definitions

Vessel type - select primary purpose from the drop-down, or choose 'Other' then enter another vessel type below

Applicable conversion factor - t *(*CO_2*)* /t *(*Fuel*)*, emission calculation for each fuel, as defined by IMO - this is incorporated into the calculations above

Proxy A - based on yearly energy consumption

Installed rated power - input for each engine individually

Yearly running hours - input for each engine individually

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Definitions

Vessel type - select primary purpose from the drop-down, or choose 'Other' then enter another vessel type below

Applicable conversion factor - t *(*CO_2*)* /t *(*Fuel*)*, emission calculation for each fuel, as defined by IMO - this is incorporated into the calculations above

Proxy A - based on yearly energy consumption

Installed rated power - input for each engine individually

Yearly running hours - input for each engine individually

R value for Proxy A is the average energy ratio based on a measure of E and Pg:

R = E/ Pg = kg CO_2 per gross kWh

E = Total kg CO_2 emitted per year, calculated on the basis of the fuel consumed per year and applicable conversion factors for each type of fuel.

Pg = Total gross power output generated per year, i.e. Σ(installed rated power per engine × yearly running hours per engine)

Proxy B - based on effective (operational) utilisation time of the vessel

R value for Proxy B is the average energy ratio based on a measure of E and U:

R = E/U = kg CO_2 per operational utilisation hour

E = Total kg CO_2 emitted per year, calculated on the basis of the fuel consumed per year and the applicable conversion factors for each type of fuel.

U = Total hours under way per year

(total hours at sea either steaming or on DP - time spent undergoing repairs or mobilising in port should not be included in the calculation)

FuelData
Ready 100%

In Summary

- Data will drive decision-making on the revision of IMO's GHG Strategy beyond 2023
- 'Transport work' is considered to be the appropriate proxy for assessing the Carbon Intensity (CI) of cargo vessels
- The offshore and marine contracting sector will be assessed by a different metric – Proxy A, Proxy B or an alternative such as total carbon emissions
- Additional data is required from the offshore and marine contracting sector to enable the alternative proxies to be considered
- Hence our Call to Action for members support for this initiative!

Improving performance in the
marine contracting industry

Dr Shuang ZHANG

Dr Shuang Zhang

Associate Professor Shipping Development Research Institute of Dalian Maritime University

- Shuang has been focusing on international rules related to energy efficiency and GHG emissions reduction from ships for more than ten years.
- She is the co-author of the *Fourth IMO GHG Study 2020*, the key architect of the IMO carbon intensity rating mechanism and the coordinator of the Correspondence Group of IMO on the development of technical guidelines on carbon intensity reduction.

Carbon intensity indicator & rating mechanisms

Implications for offshore and marine contracting sector

Dr. Shuang ZHANG

Dalian Maritime University

zhangshuang_dmu@163.com

Outline

1. What is carbon intensity of international shipping
2. What is carbon intensity indicator
3. What is CII rating mechanism
4. Why offshore and marine contracting sector not covered
5. Discussions at MEPC and CG
6. Possible steps to include offshore and marine contracting sector to CII rating mechanism

1. What is carbon intensity of international shipping?

Initial IMO Strategy on Reduction of GHG Emissions from Ships

Resolution MEPC.304(72) (adopted on 13 April 2018)

Levels of ambition

.1 carbon intensity of the ship to decline through implementation of further phases of the energy efficiency design index (EEDI) for new ships

.2 carbon intensity of international shipping to decline

*to reduce **CO_2 emissions** **per** **transport work**, as an average across international shipping, by at least 40% by 2030, pursuing efforts towards 70% by 2050, compared to 2008*

Definition for ships for transport purposes

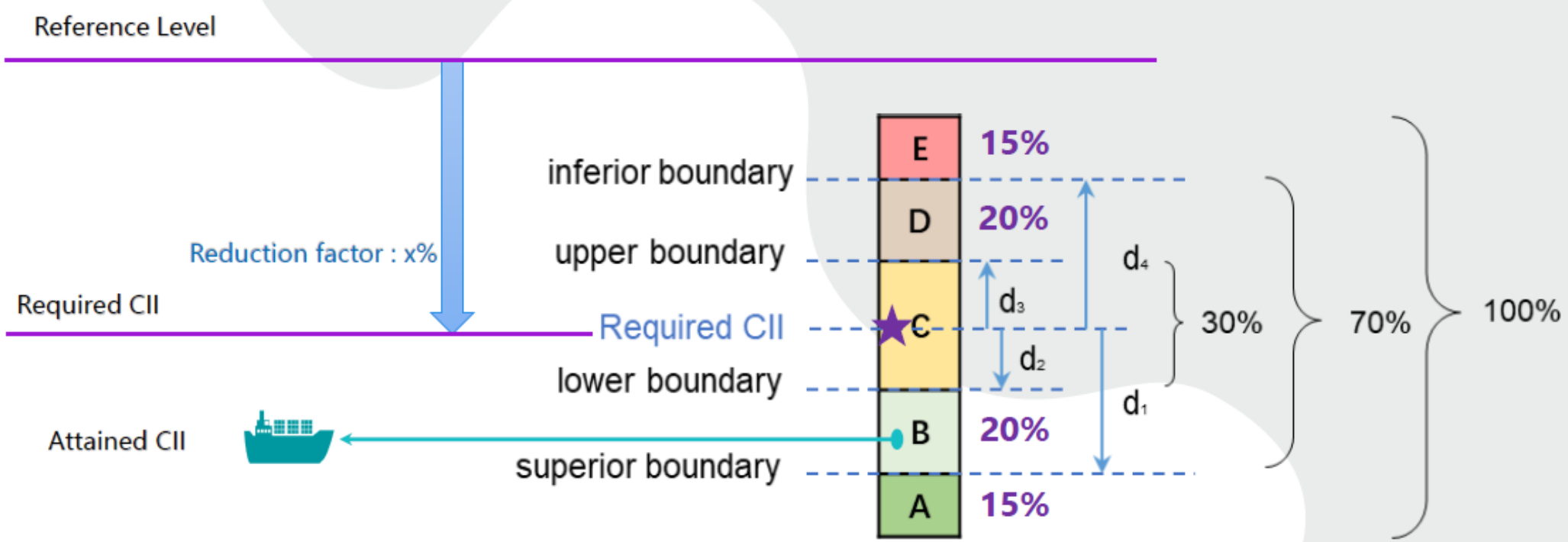
.3 GHG emissions from international shipping to peak and decline

2. What is carbon intensity indicator (CII) ?

- **Carbon intensity indicator (CII)**
  - A general term referring to any metric developed to measure carbon intensity of ships
  - Base form: CII = CO_2/ Transport work
- **Specific forms of CII determined by "transport work"**
  - CII based on actual transport work (t · nmile, teu ·nmile, person·nmile, etc)
    - ✓ EEOI = CO_2 / (t·n mile), etc
  - CII based on transport work proxy
    - ✓ AER = CO_2 / (dwt · distance)
    - ✓ cgDIST = CO_2 / (gt ·distance)
    - ✓ EEPI = CO_2 / (dwt or gt · laden distance)
    - ✓ cbDIST= CO_2 / (lower berths · distance)
    - ✓ clDIST= CO_2 / (lane length · distance)

RESOLUTION MEPC.336(76) (adopted on 17 June 2021): 2021 GUIDELINES ON OPERATIONAL CARBON INTENSITY INDICATORS AND THE CALCULATION METHODS (CII GUIDELINES, G1)

3. What is CII rating mechanism ?



4. Why offshore and marine contracting sector not covered by CII rating mechanism

■ Application of current CII mechanism

- Ships of 5000 GT and above
- EEDI ship types + cruise passenger with traditional propulsion
- First compliance period： 1 Jan 2023 – 31 Dec 2023

■ Reasons for excluding offshore and marine contracting vessels

- Not for "transport" purpose： current carbon intensity definition and indicators not applicable
- No clear ship type definition: shown as "others" in DCS database
- Insufficient data available: no agreed CII /reference lines

5. Discussions at MEPC and CG

.1 Proxy A: a proxy based on yearly energy consumption, defined as follows:

$$P_A = \frac{\text{Total kg } CO_2 \text{ emitted/year}}{\text{Total gross output power generated/year}} = \frac{\text{Total kg } CO_2 \text{ emitted/year}}{\sum(\text{installed rated power}_i \times \text{yearly engine running hours}_i)} \quad [\text{kg CO2/kWh}]; \text{ and}$$

.2 Proxy B: a proxy based on effective (operational) utilization, defined as follows:

$$P_B = \frac{\text{Total kg } CO_2 \text{ emitted/year}}{\text{Total hours underway/year}} \quad [\text{kg CO2/hour}].$$

Candidate Proxies

- MEPC 74/6, Russian Federation and IMCA
- Report of the Correspondence Group on Air Pollution and Energy Efficiency MEPC 76/5/1

■ **Operational Data under DCS**

Fuel oil type and consumption
Methods for fuel oil data collection
~~Distance travelled~~
Hours underway

■ **Additional Data for proxy A**
Running hours per engine

■ **Technical characteristics**
Ship type?
Capacity/**Capability**?
~~Gross tonnage (GT) ; Net tonnage (NT)~~
~~Deadweight tonnage (DWT)~~
Power output (rated power) of main and auxiliary reciprocating internal combustion engines over 130 kW
~~EEDI (if applicable)~~
Ice class

Decision made by MEPC76 (June 2021)

5.11 The Committee agreed in principle to the way forward for determining proxies for offshore and marine contracting vessels … while noting the proposals in document MEPC 76/5/3 (IMCA), namely:

.1 that the reporting to the Organization **via email** should be preferably done via Member States and relevant industry organizations; and

.2 for offshore and marine contracting vessels, to collect "total yearly running hours on all engines" and "total installed rated power from all engines in kW" in addition to the IMO DCS data, if applicable, **for trial on a voluntary basis**.

5.12 The Committee noted an intervention by the observer from **IMCA** … advising that they **had already collected data** regarding the two proxies for offshore and marine contracting vessels on behalf of its members, which they were invited to share with the Secretariat.

5.13 MEPC 76 agreed to forward the above-mentioned **proposals to the CG on Carbon Intensity Reduction**, with a view to developing possible parameters and templates for **reporting, verification and submission** of data for trial CIIs of individual ships on a voluntary basis, including trial proxies for offshore and marine contracting vessels and cruise passenger ships, taking into account documents MEPC 76/5/1 and MEPC 76/5/3.

TOR for the CG on Carbon Intensity Reduction

TOR 4.2 - develop possible parameters and templates for reporting, verification and submission of data for trial CIIs of individual ships on voluntary basis, as specified in G1 and for **other trial metrics of offshore and marine contracting vessels**, taking into account documents MEPC 76/5/1, MEPC 76/5/3, MEPC 76/7/34 and MEPC 76/7/47.

TOR 1 further consider and finalize the draft updated Guidelines for the development of a Ship Energy Efficiency Management Plan (**SEEMP**)

TOR 2.1 further consider and update *2017 Guidelines for administration* ***verification*** *of ship fuel oil consumption data* (resolution MEPC.292(71));

TOR 2.2 further consider and update *2017 Guidelines for the development and management of the IMO Ship Fuel Oil Consumption* ***Database*** (resolution MEPC.293(71));

Data collection by ships and report to Administration

Data verification by Administration

Data submission to IMO by Administration

Dilemma faced by the CG

- For data **reported** by a **ship to the Administration**:

SEEMP guidelines can be updated to include mandatory/voluntary CIIs and parameters for other trial metrics of offshore and marine contracting vessels.

Consequence: Data will be reported by individual **ships to Administration for verification, rather than directly submitted to IMO via email.**

- For data **submitted** from an **Administration to IMO** GISIS:

2017 Guidelines for the development and management of the IMO Ship Fuel Oil Consumption ***Database*** (resolution MEPC.293(71)) may be updated.

However, given **no legal basis**, neither mandatory / voluntary CIIs nor parameters for other trial metrics of offshore and marine contracting vessels can be included in IMO DCS Database at current stage.

Consequence: Additional data could **not** be submitted to DCS Database for analysis or consideration before DCS is amended; and ship type will still be presented as "**others**"

Preference of IMCA

- MCA members prefer that **IMCA reports to the IMO on their behalf** rather than them doing so individually via the Administration or the RO, during the **stage of data collection to assess the suitability of the proxies**.
- Once a proxy has been selected and **embedded in MARPOL** or another appropriate IMO instrument, data collection shall be **via the Administration or RO**.

Alternative solution proposed by CG coordinators in consultation with IMCA

- Trial metrics of offshore and marine contracting vessels are **not recommended** to be included in the SEEMP guidelines and Verification guidelines **at this stage**; and
- Instead, **IMCA** would be invited to share the data through a MEPC document annually, similar to those prepared by the Secretariat for IMO DCS (refer to MEPC 76-6-1 and MEPC 77-6-1).

Possible steps to include offshore and marine contracting sector to CII rating mechanism

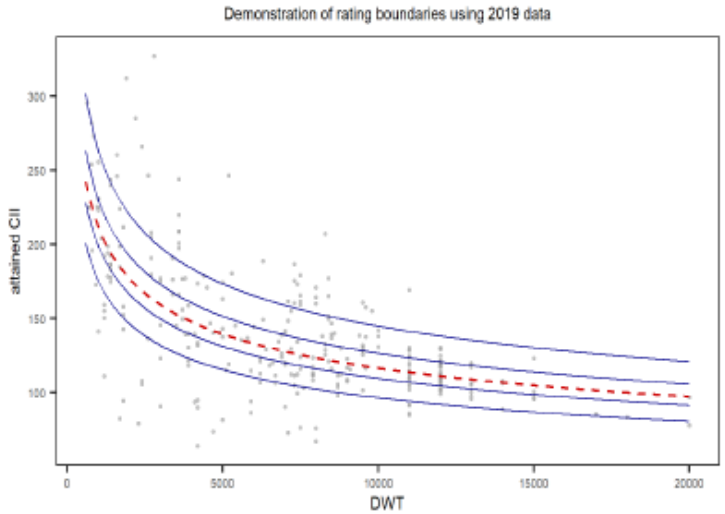
CII Rating is far more than a proxy

- For cargo/passenger ships:

  Required CII = (1-reduction factor) ·a· Capacity $^{-c}$

Rationale: ships with the same capacity (DWT/GT) are **comparable.**

- For offshore and marine contracting sector:
  - Which vessels can be **comparable**?
    - ✓ Does ship **type** matter?
    - ✓ Which **technical characteristics** duly indicate the **capability**, such as installed rated power?
  - If Required **CII = f (capability)** is applicable
    - ✓ Specification of reference line function ***f* (capacity)** and **rating boundaries** based on data analysis.
    - ✓ Determination of annual **reduction rate** relative to reference value (preferably in year 2019).



Data collection

Operation data
- Fuel type/consumption
- Method used
- Hours underway
- Running hours per engine

Technical characteristics
- Ship type (to be defined)
- Rated power per engine
- ?

Identification and others

Data analysis

Proxies
- A and/or B
- others?

Reference line (value)
- *f* (capability)

Rating boundaries
- Distribution of attained CII

Reduction factors over years
- Levels of ambition
- Other ship types

Proposal development

Recommended timing
- Review by 2026

Amendments to MARPOL
- Ship type definition
- DCS
- CII Rating

Revisions of Guidelines
- G1-G4
- SEEMP and its verification
- DCS/CII Verification
- Database

Thank you for your attention !

CONTACT

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Dr Shuang ZHANG

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Tore Longva

Principal
Consultant
DNV

- **Tore Longva, Principal Consultant, DNV**
- MSc in Industrial Economics from the Norwegian University of Science and Technology (2004).
- Tore has worked in DNV since 2006 on research and business development projects, and currently he is holding a position in the Regulatory Affairs department.
- His focus areas are innovation in maritime transport value chains; and improving environmental performance of shipping.
- Tore Longva has been a key part of several forecast studies on emission reduction and cost-benefit assessments of technologies.
- He has been following closely the development of regulating GHG in shipping as an advisor in the Norwegian delegation to the Marine Environmental Protection Committee in the IMO.

WHEN TRUST MATTERS

Emission reporting for offshore vessels

IMCA Webinar
17 February 2022

Tore Longva – DNV, Regulatory Affairs

Background and challenge

- IMO have developed EEDI / EEXI / CII for shipping, with main focus on improving energy efficiency and carbon intensity

In its most simple form, the attained annual operational CII of individual ships is calculated as the ratio of the total mass of CO_2 (M) emitted to the total transport work (W) undertaken in a given calendar year, as follows:

$$attained\ CII_{ship} = M / W \qquad (1)$$

MEPC.336(76) – CII Calculation Guidelines

- Offshore vessels are exempted from the above regulations as they are engaged with services where normal cargo transportation is not the main purpose.
- Banks & financing institutions has committed to a carbon trajectory of their portfolio through the Poseidon Principles. Offshore vessels are not included.

- Challenge: how can offshore and marine contracting vessels demonstrate their performance relative to a work measure?

Alternative concepts for offshore

Current concept for cargo/cruise ships:

$$\text{CII (cargo)} = \frac{\text{Annual fuel consumption} \bullet \text{CO}_2\text{ factor}}{\text{Annual distance travelled} \bullet \text{Capacity (DWT or GT)}}$$

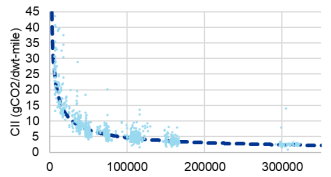
Identify and use a different work proxy:

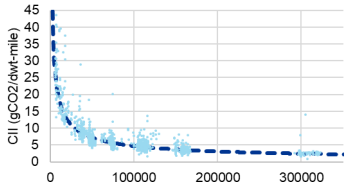
(e.g. MEPC 74/6)

$$\text{CII (service)} = \frac{\text{Annual fuel consumption} \bullet \text{CO}_2\text{ factor}}{\text{Work proxy}}$$

Split emissions into operational modes each with a specific proxy for work:

$$\text{CII (service)} = \frac{\text{FC ops 1} \bullet \text{CO}_2\text{ factor}}{\text{Work ops 1}} + \frac{\text{FC ops 2} \bullet \text{CO}_2\text{ factor}}{\text{Work ops 2}}$$





Fuel GHG standard – emissions relative to energy provided:

(MEPC 77/7/16, ISWG-GHG 10/5/3)

$$\text{Fuel standard} = \frac{\text{Annual fuel consumption} \bullet \text{GHG WtW factor}}{\text{Fuel energy}}$$

Proposal for indicators for offshore and marine contracting vessels (MEPC 74/6 – MCA/Russia)

$$\text{CII (service)} = \frac{\text{Annual fuel consumption} \bullet \text{CO}_2\text{ factor}}{\text{Work proxy}}$$

$$R = \frac{E}{Pg} = \frac{\text{Total kg } CO_2 \text{ emitted / year}}{\text{Total gross power output generated/year}} = \textbf{kg } \textbf{CO}_2\textbf{/ Gross kWh}$$

(i.e. Σ installed rated power per engine x yearly running hours per engine)

where:

R	The average energy ratio based on a measure of E and Pg.
E	Total kg CO_2 emitted/year i.e. the total amount of CO_2 calculated on the basis of the fuel consumed per year, taking into account the applicable conversion factors for a particular type of fuel.
Pg	Total calculated gross kWh generated/year i.e. the sum of the installed rated power per engine multiplied by the yearly running hours per engine.

$$R = \frac{E}{U} = \frac{\text{Total kg } CO_2 \text{ emitted / year}}{\text{Total hours under way / year}} = \textbf{kg } \textbf{CO}_2\textbf{/ operational utilization hour}$$

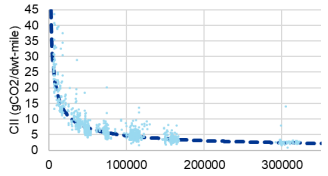
Where:

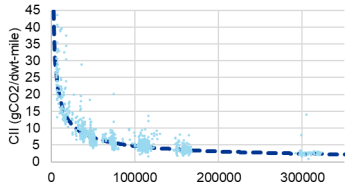
R	The average energy ratio based on a measure of E and U.
E	Total kg CO_2 emitted/year i.e. the total amount of CO_2 calculated on the basis of the fuel consumed per year, taking into account the applicable conversion factors for a particular type of fuel.
U	Total hours under way. Time spent undergoing repairs or mobilizing in port should not be included in the calculation.

- Pro: Simple reporting
- Con: Does not take into account that ships may be engaged in multiple operations – hard to compare

Split emissions into operational modes each with a specific proxy for work

$$\text{CII (service)} = \frac{\text{FC ops 1} \bullet \text{CO}_2\text{ factor}}{\text{Work ops 1}} + \frac{\text{FC ops 2} \bullet \text{CO}_2\text{ factor}}{\text{Work ops 2}}$$





Examples of modes: Port, Transit, DP, Standby, Lifting operations, ...

- Pro: Enables comparison on certain modes across a larger group of ships
- Con: Requires more granular reporting, separating the emissions in different modes

Fuel GHG standard – emissions relative to energy provided (MEPC 77/7/16, ISWG-GHG 10/5/3)

- Pro: Independent of work performed – can be applied to all ship types. Focuses on fuel shift.
- Con: Focuses on well-to-wake GHG emissions of fuel only, and no further incentives on energy efficiency.

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Open Q&A

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Question and Answer Session

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Webinar: 14 February 2022 – 1100hrs GMT
Assessing the Carbon Intensity of the offshore and marine contracting sector

Speakers

Dr Shuang ZHANG

Associate Professor
Shipping Development Research Institute of Dalian Maritime University

Tore Longva

Principal Consultant
DNV

Margaret Fitzgerald

Head of Legal & Regulatory Affairs
IMCA

Open Forum guests

- Remko Kloos
  Fugro

- Eugène van Dodeweerd
  Boskalis

- Peter McCombie
  TechnipFMC

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Thank You

- **Thank you** to today's speakers, panellists and Committee

- **Thank you** for your attention

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Improving performance in the marine contracting industry