

# Revision of method for the CII Regulations

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Team CII-VILIZER

Part 1.

# BACKGROUNDS

Part 2.

# PROBLEMS

Part 3.

# SOLUTIONS

Part 4.

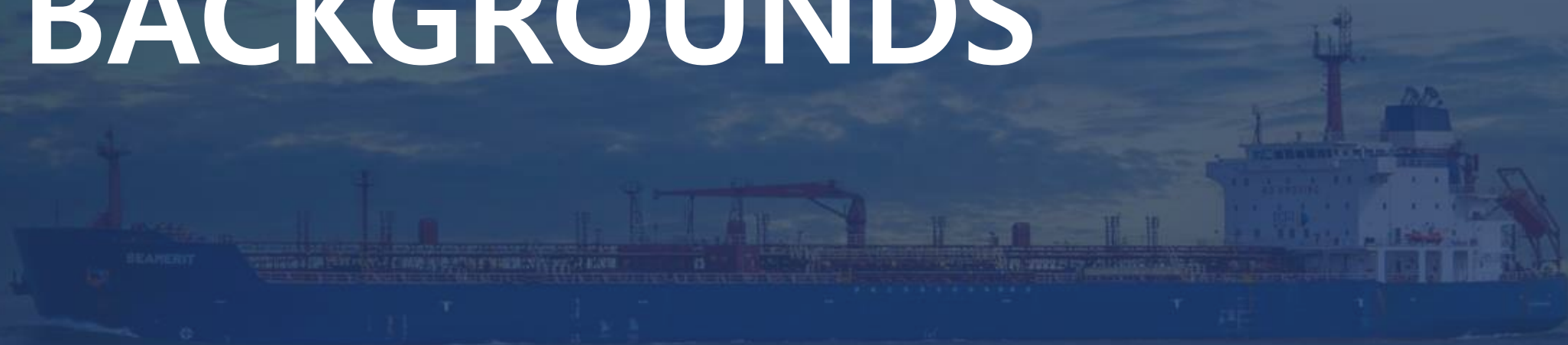
# CONCLUSIONS

Part 5.

# FURTHER

Part 1.

# BACKGROUNDS



## BACKGROUNDS

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### MEPC 80

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~ that the Organization had made in addressing GHG emissions from international shipping, and encouraging the Committee to adopt a revised IMO GHG Strategy committing international shipping to achieve **net zero emission by 2050** at the latest, thereby contributing to global ~

## BACKGROUNDS

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### MARPOL 73/78 ANNEX VI Reg. 28

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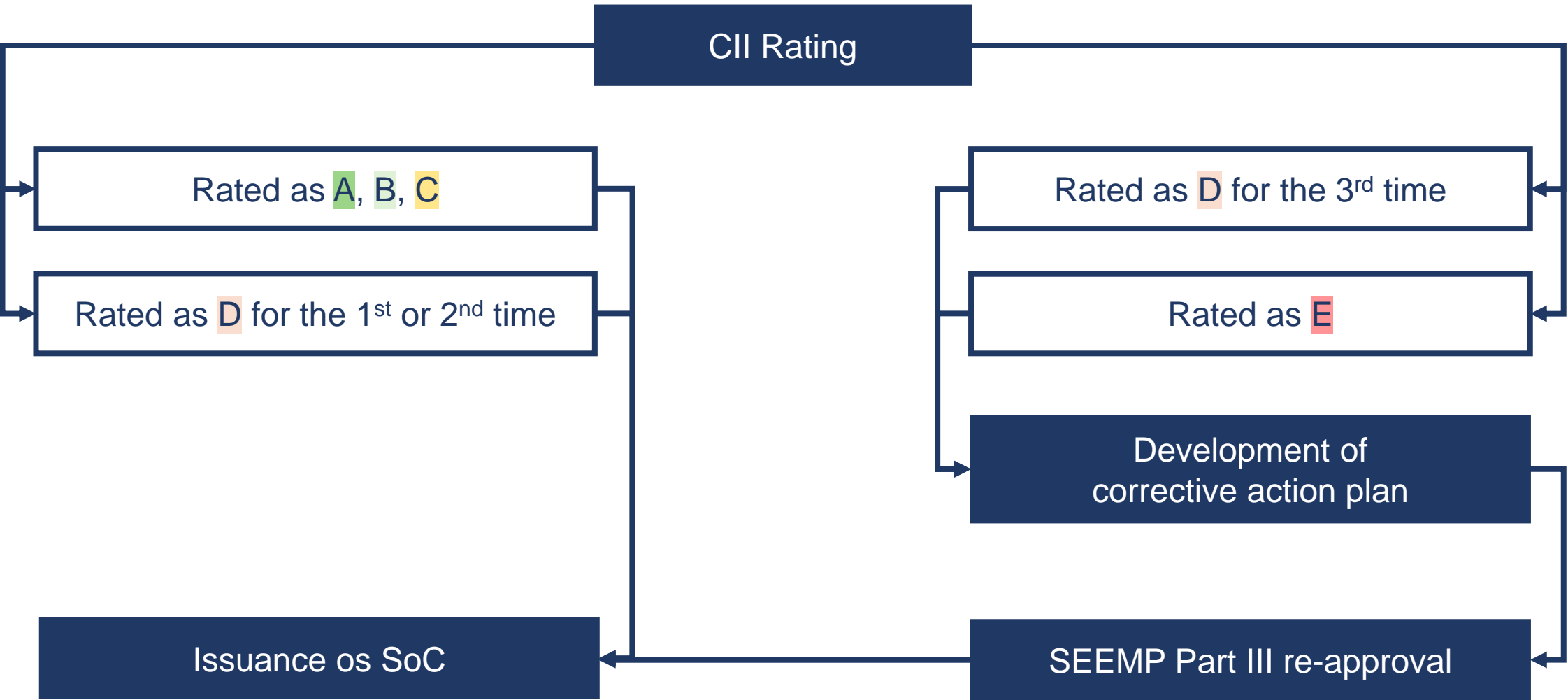
1. After the end of calendar year 2023 and after the end of each following calendar year, each ship of 5,000 gross tonnage and above ~ shall **calculate the attained annual operational CII** ~

# BACKGROUNDS



1) MEPC 76/15 12 July 2021 – REPORT OF THE MARINE ENVIRONMENT PROTECTION COMMITTEE ON ITS SEVENTY-SIXTH SESSION  
2) MEPC 75/18 15 December 2020 - REPORT OF THE MARINE ENVIRONMENT PROTECTION COMMITTEE ON ITS SEVENTY-FIFTH SESSION  
3) RESOLUTION MEPC.304(72) - INITIAL IMO STRATEGY ON REDUCTION OF GHG EMISSIONS FROM SHIPS

# BACKGROUNDS



1) "KR Homepage \_ Decarbonization & Digitalization \_ Decarbonization \_ GHG Verification \_ CII", KR

## BACKGROUNDS

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## BACKGROUNDS

- 1<sup>st</sup>  
**Attained CII<sub>ship</sub>**
- 2<sup>nd</sup>  
CII<sub>ref</sub>
- 3<sup>rd</sup>  
Required CII
- 4<sup>th</sup>  
Boundary of CII

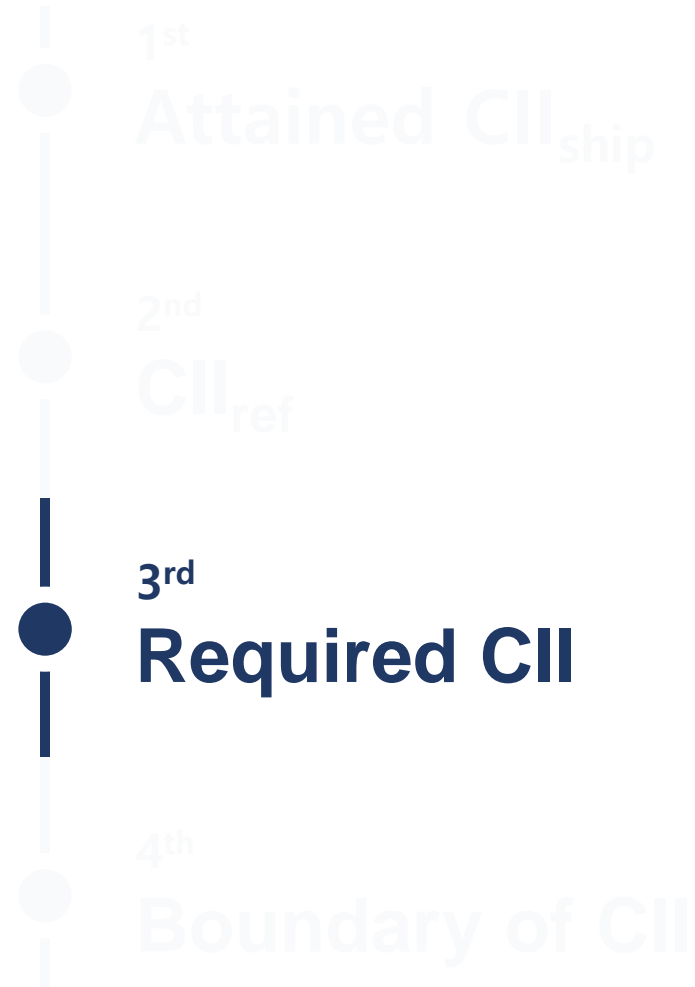
$$\frac{\sum (FC_j \times C_{Fj})}{Capacity \times total Distance traveled}$$

## BACKGROUNDS



$$CII_{ref} = aCapacity^{-c}$$

## BACKGROUNDS



$$\left(1 - \frac{Z}{100}\right) \times CII_{ref}$$

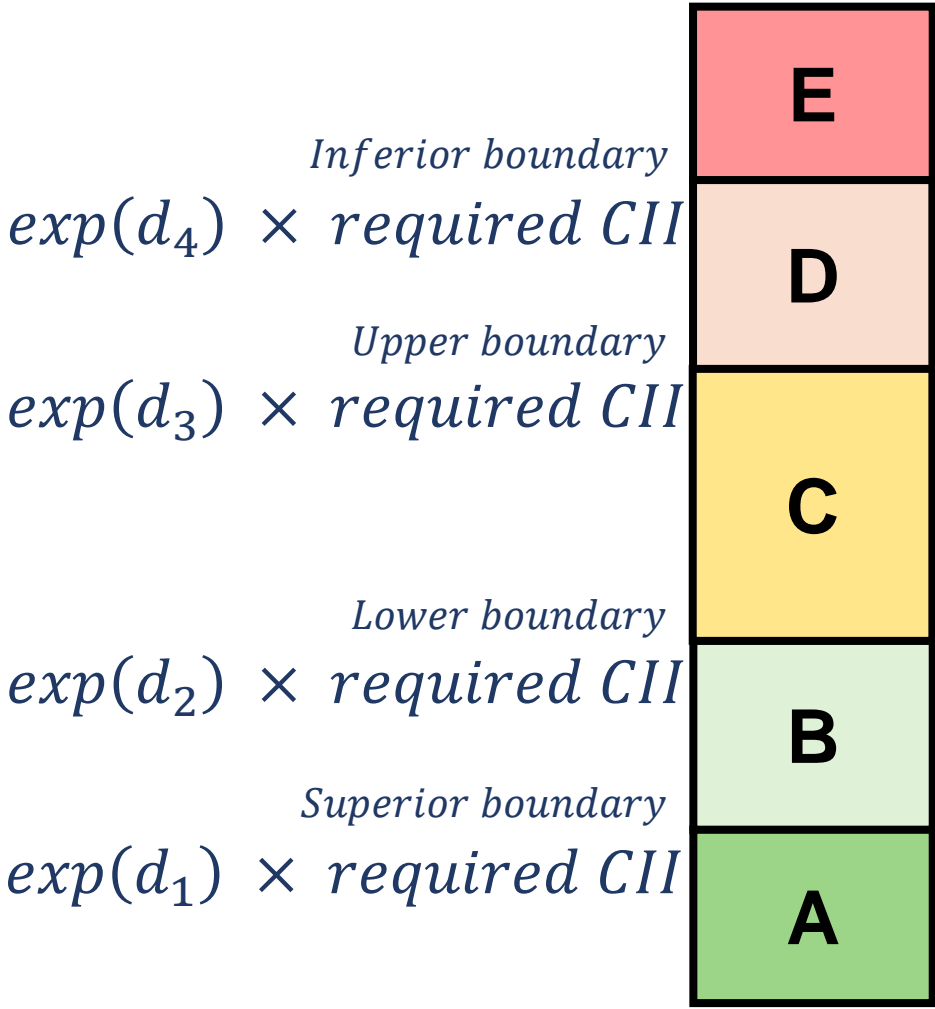
# BACKGROUNDS



YEAR	Reduction factor (Z%) for the CII relative to the 2019 reference line
2023	5%
2024	7%
2025	9%
2026	11%
2027	Further strengthened and developed taking into account the review of short term measurement.
2028	
2029	
2030	

1) RESOLUTION MEPC.338(76) – 2021 GUIDELINES ON THE OPERATIONAL CARBON INTENSITY REDUCTION FACTORS RELATIVE TO REFERENCE LINES (CII REDUCTION FACTORS GUIDELINES, G3)

# BACKGROUNDS



Part 2.

# PROBLEMS



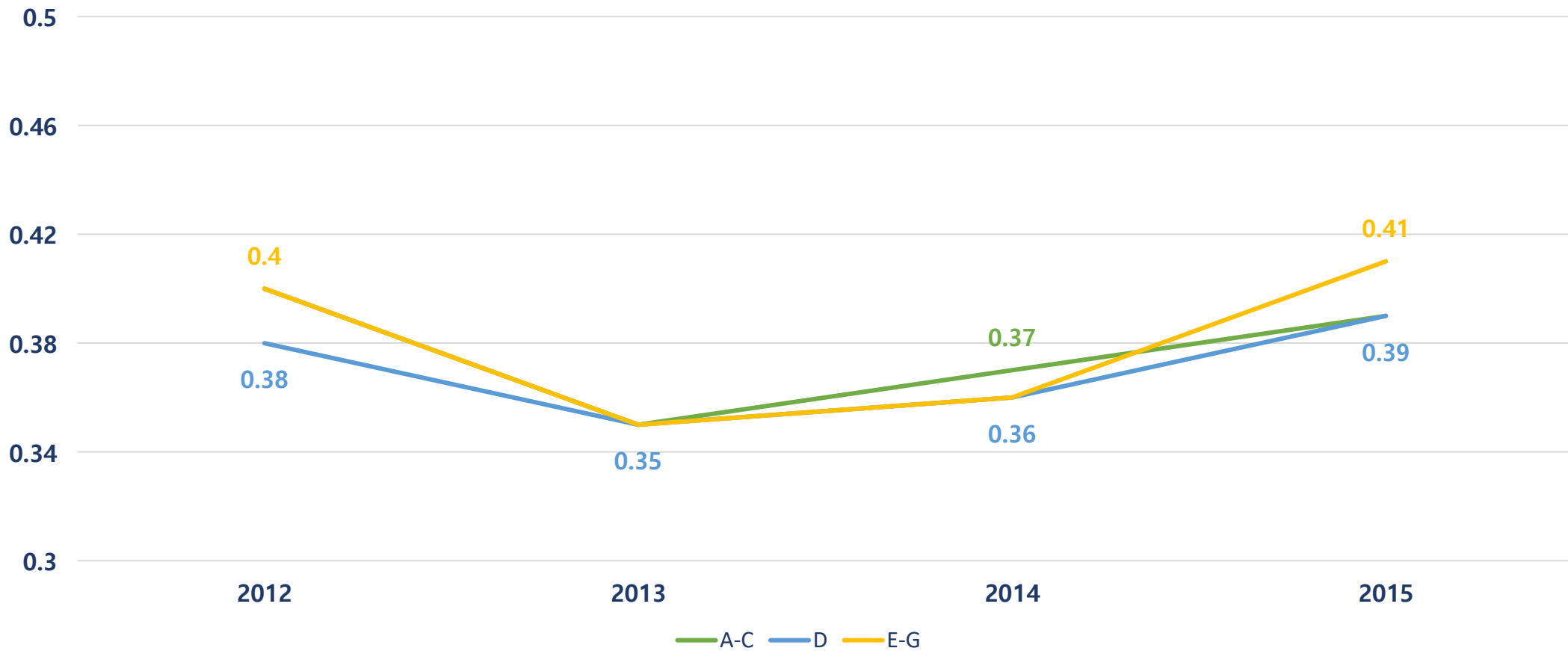
# PROBLEMS

## Influence coefficient of ship's deadweight on fuel consumption of main engine.

Ship type	CONTAINER SHIP	DRY BULK CARRIER	GENERAL CARGO SHIP	LIQUID BULK CARRIER	PASSANGER SHIP	OTHER SHIPS
Value	0.90 ~ 0.98	0.90 ~ 0.98	0.85 ~ 0.95	0.85 ~ 0.95	1.00	0.85 ~ 1.00

1) "Calculation Method of Marine Ship Fuel Consumption (2020)", Jing Li, Yuanming Jia

## Median ballast ratios over time for Capesize fleet

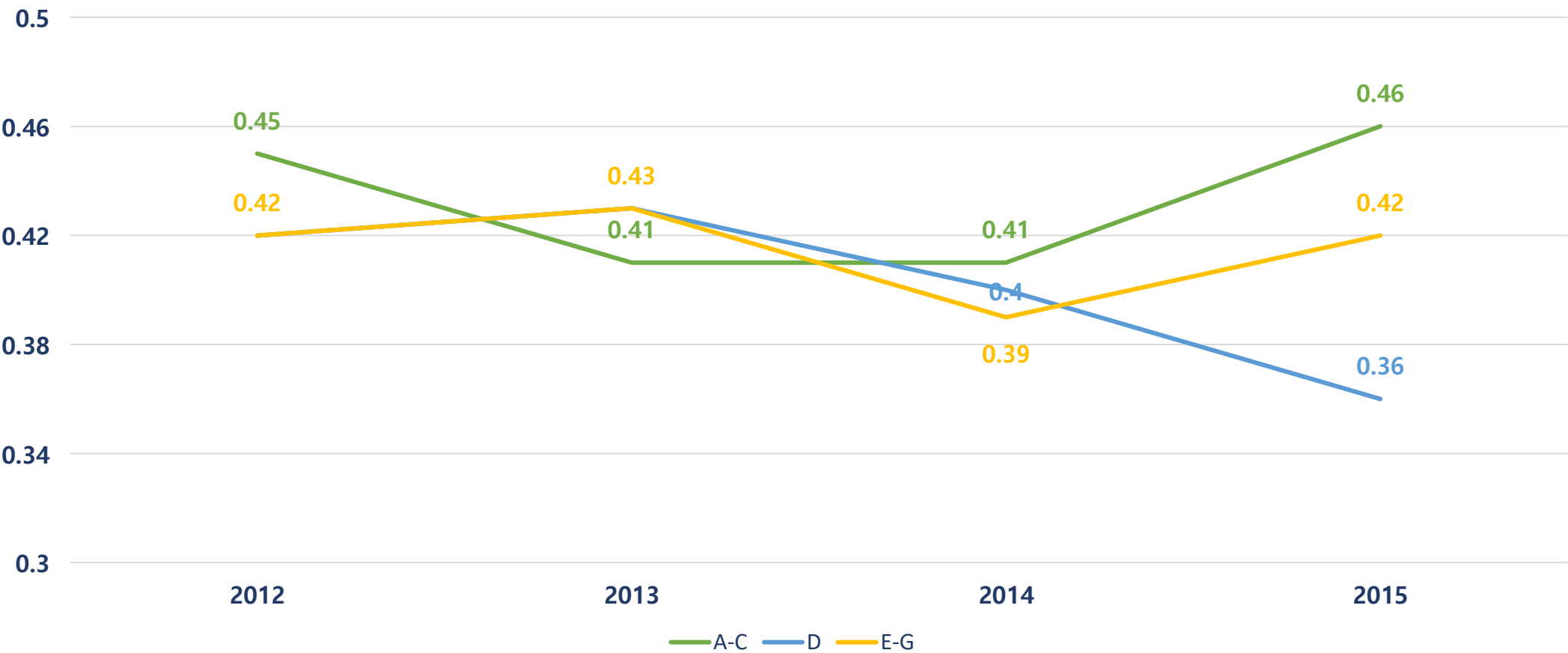


1) "Revealed preferences for energy efficiency in the shipping markets (2016)", UCL ENERGY INSTITUTE



# PROBLEMS

Median ballast ratios over time for VLCC fleet



1) "Revealed preferences for energy efficiency in the shipping markets (2016)", UCL ENERGY INSTITUTE

# PROBLEMS

[e.g.]

## 2023 IMO DCS data value of “M/V ALPHA” in laden condition [e.g.]

Ship type	GT	DWT	HFO Cons.	MGO Cons.	Sailing
DRY BULK CARRIER	39,052	69,999	5,693 ton	26 ton	61,523 Nautical Mile

## 2023 IMO DCS data value of “M/V BETA” in ballast condition (40% of the total) [e.g.]

Ship type	GT	DWT	HFO Cons.	MGO Cons.	Sailing
DRY BULK CARRIER	39,052	69,999	5,465 ton	25 ton	61,523 Nautical Mile

1) “CII 규제 대응 지침서 (October 2021)”, KR

# PROBLEMS

[e.g.]

2023 IMO DCS data value of “M/V ALPHA” in laden condition [e.g.]

Attained CII	4.14	CII <sub>R</sub>	4.60	Required CII	4.37
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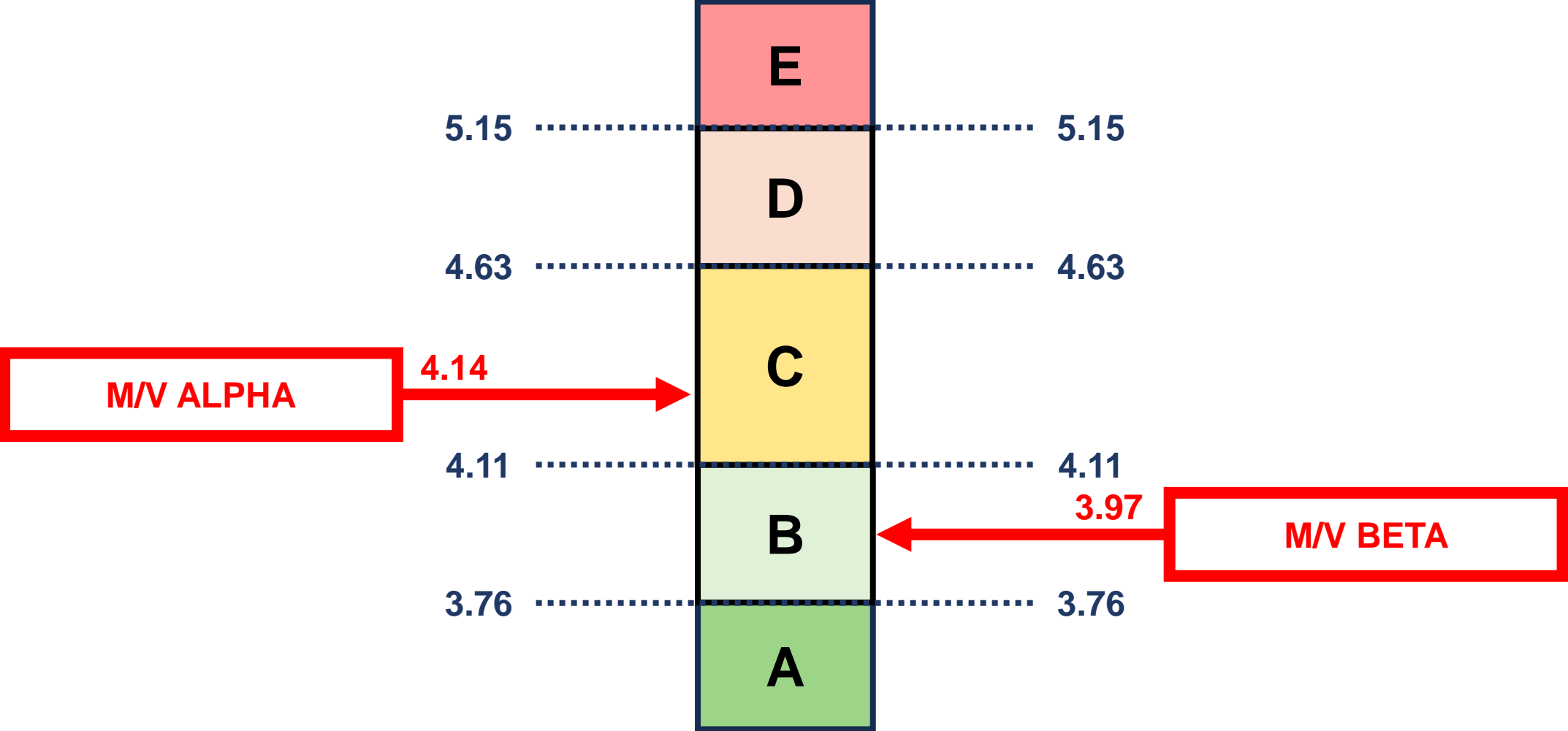
2023 IMO DCS data value of “M/V BETA” in ballast condition (40% of the total) [e.g.]

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1) “CII 규제 대응 지침서 (October 2021)”, KR

# PROBLEMS

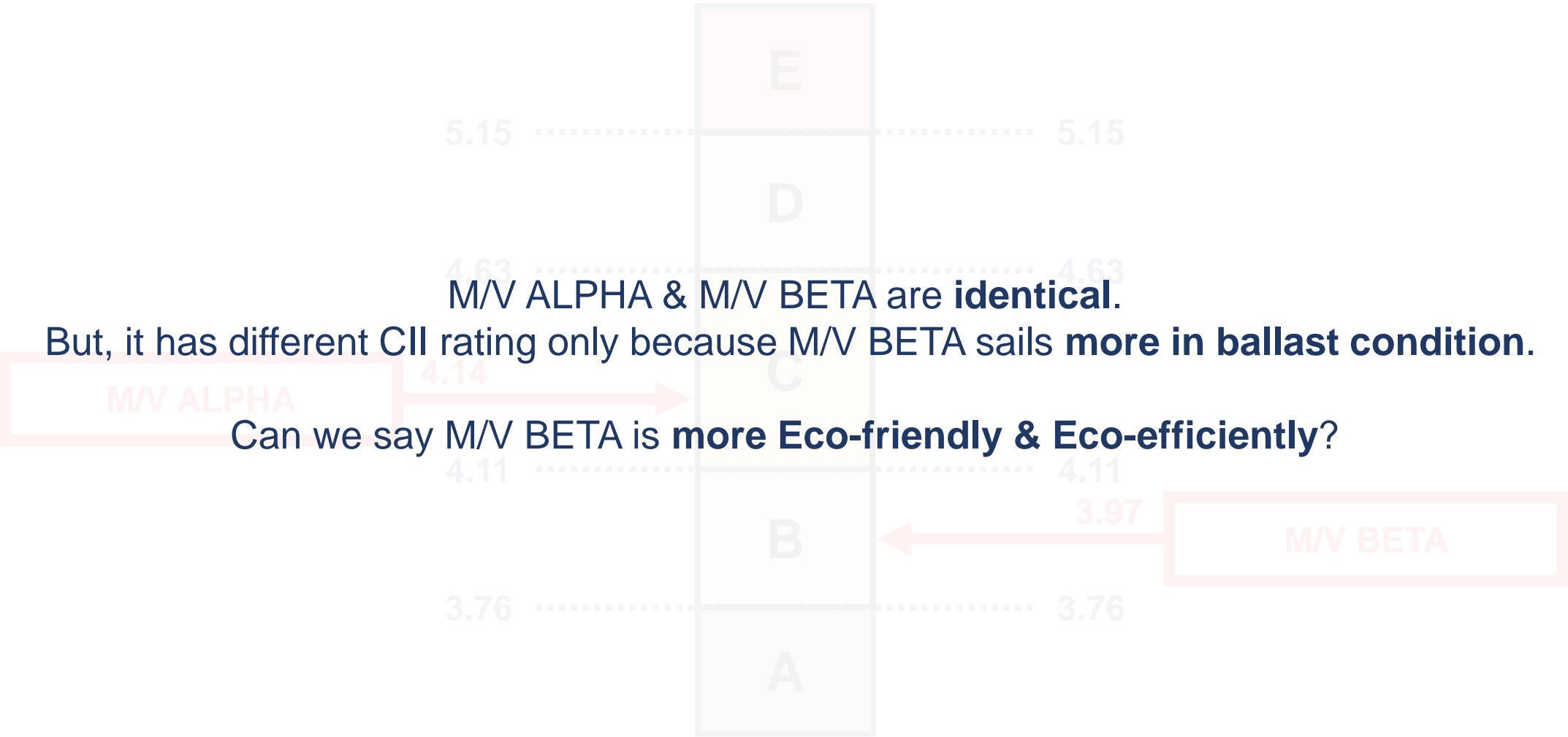
[e.g.]



1) "CII 규제 대응 지침서 (October 2021)", KR

# PROBLEMS

[e.g.]



M/V ALPHA & M/V BETA are **identical**.

But, it has different CII rating only because M/V BETA sails **more in ballast condition**.

Can we say M/V BETA is **more Eco-friendly & Eco-efficiently**?

1) "CII IS NOT THE ANSWER – WHAT DO WE DO NOW? (7th December 2022)", Scott Bergeron of OLENDORFF CARRIERS



Part 3.

# SOLUTIONS

## SOLUTIONS

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- 1<sup>st</sup>  
**Attained  $CII_{ship}$**
- 2<sup>nd</sup>  
 **$CII_{ref}$**
- 3<sup>rd</sup>  
**Required  $CII$**
- 4<sup>th</sup>  
**Boundary of  $CII$**

# SOLUTIONS

1<sup>st</sup>  
● Attained CII<sub>ship</sub>

2<sup>nd</sup>  
● CII<sub>ref</sub>

3<sup>rd</sup>  
●  $AER = \frac{\text{Annual } CO_2 \text{ emissions}}{\text{Deadweight} \times \text{Distance sailed}} = \frac{\sum_j FC_j \times C_{Fj}}{DWT \times D} = \frac{g_{CO_2}}{DWT \text{ mile}}$

4<sup>th</sup>  
● Boundary of CII



# SOLUTIONS

1st  
● Attained  $CII_{ship}$

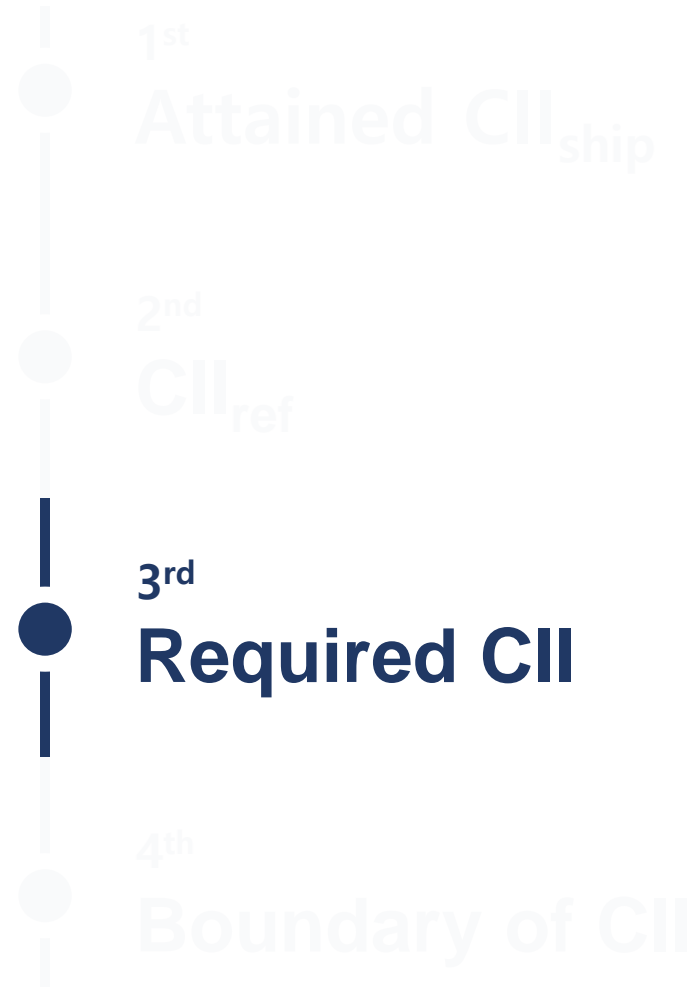
2nd  
●  $CII_{ref}$

3rd  
●  $AER = \frac{\text{Annual } CO_2 \text{ emissions}}{\text{Deadweight} \times \text{Distance sailed}} = \frac{\sum_j FC_j \times C_{Fj}}{DWT \times D} = \frac{g_{CO_2}}{DWT \text{ mile}}$

4th  
● Boundary of  $CII$

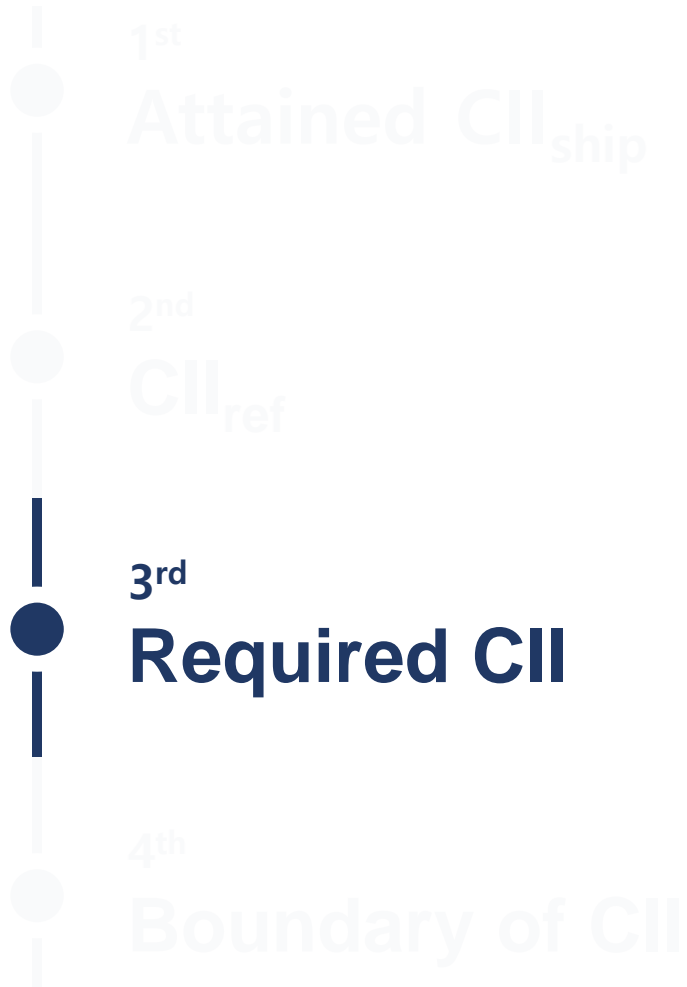
└ Fixed to vessel's capacity

# SOLUTIONS



$$\left(1 - \frac{Z}{100}\right) \times CII_{ref}$$

# SOLUTIONS



Reduction factor for the CII  
relative to the  
2019 reference line

$$\left(1 - \frac{\textcolor{red}{Z}}{100}\right) \times CII_{ref}$$

# SOLUTIONS



YEAR	Reduction factor (Z%) for the CII relative to the 2019 reference line
2023	5%
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1) RESOLUTION MEPC.338(76) – 2021 GUIDELINES ON THE OPERATIONAL CARBON INTENSITY REDUCTION FACTORS RELATIVE TO REFERENCE LINES (CII REDUCTION FACTORS GUIDELINES, G3)

# SOLUTIONS

YEAR	Reduction factor relative to 2019 (for the vessel which sails less than 40% of its total sailing in ballast condition)
2023	5%
2024	7%
2025	9%
2026	11%
2027	Further strengthened and developed taking into account the review of short term measurement.
2028	
2029	
2030	

# SOLUTIONS

YEAR	Reduction factor relative to 2019 (for the vessel which sails more than 40% of its total sailing in ballast condition)
2023	9%
2024	11%
2025	13%
2026	15%
2027	Further strengthened and developed taking into account the review of short term measurement.
2028	
2029	
2030	

# SOLUTIONS

YEAR	Less than 40% in ballast condition	More than 40% in ballast condition
2023	5%	9%
2024	7%	11%
2025	9%	13%
2026	11%	15%
2027	<div> <div>+4%p</div> <div>Further strengthened and developed taking into account the review of short term measurement.</div> </div>	
2028		
2029		
2030		

# SOLUTIONS

[e.g.]

## 2023 IMO DCS data value of “M/V ALPHA” in laden condition [e.g.]

Ship type	GT	DWT	HFO Cons.	MGO Cons.	Sailing
DRY BULK CARRIER	39,052	69,999	5,693 ton	26 ton	61,523 Nautical Mile

## 2023 IMO DCS data value of “M/V BETA” in ballast condition (40% of the total) [e.g.]

Ship type	GT	DWT	HFO Cons.	MGO Cons.	Sailing
DRY BULK CARRIER	39,052	69,999	5,465 ton	25 ton	61,523 Nautical Mile

1) “CII 규제 대응 지침서 (October 2021)”, KR



# SOLUTIONS

[e.g.]

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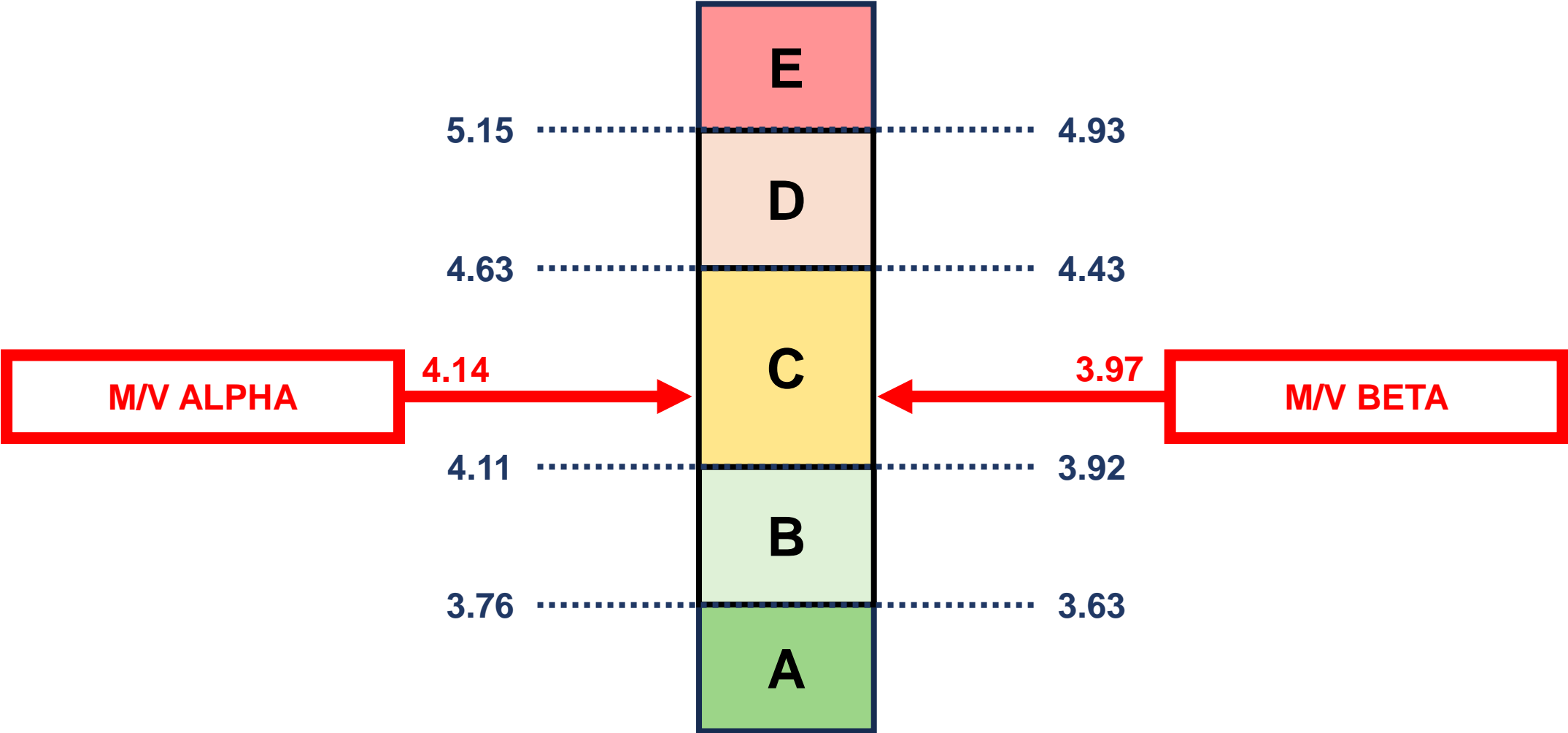
2023 IMO DCS data value of “M/V BETA” in ballast condition (40% of the total) [e.g.]

Attained CII	3.97	CII <sub>R</sub>	4.60	Required CII	4.37 ▶ <u>4.18</u>
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1) “CII 규제 대응 지침서 (October 2021)”, KR

# SOLUTIONS

[e.g.]



1) "CII 규제 대응 지침서 (October 2021)", KR

# CII Regulation



# CII Regulation



# GHG Levy

CII Regulation



## SOLUTIONS – GHG LEVY

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### MEPC 80

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~ in order to find solutions to resolve the draft text of the 2023 IMO GHG Strategy, ~ the Committee expressed its sincere appreciation to the Chair of the ISWG-GHG, ~

## SOLUTIONS – GHG LEVY

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### ISWG-GHG 15

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Several delegations expressed a clear preference for a universal GHG levy as they considered it as the simplest economic measure being considered ~

## SOLUTIONS – GHG LEVY

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### MEPC 80

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Having considered the report of the Working Group on  
Reduction of GHG Emissions from Ships

**(MEPC 80/WP.12)**, ~



## SOLUTIONS – GHG LEVY

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### MEPC 80/WP.12 [RESOLUTION MEPC 337 (80)]

*Basket of candidate mid-term GHG reduction measures*

an economic element, on the basis of  
a maritime GHG emissions pricing mechanism.

## SOLUTIONS – GHG LEVY



Vessel's CII Rating	Points ( <i>Per vessel</i> )
A	3
B	2
C	1
D	0
E	0

# SOLUTIONS – GHG LEVY



Group	Points ratio ( $CAP^*/CMP^{**} \times 100$ )
Advance	100% ~ 81%
Moderate	80% ~ 61%
Fragile	60% ~ 0%

\*CAP : Company vessel's Attained Points

\*\*CMP : Company vessel's Maximum points

1) "FIVE THINGS TO KNOW ABOUT CARBON PRICING (2021)", Ian Perry of IMF

# SOLUTIONS – GHG LEVY



Group	Price ( \$/tCO <sub>2</sub> eq )
Advance	25
Moderate	50
Fragile	75

1) "FIVE THINGS TO KNOW ABOUT CARBON PRICING (2021)", Ian Perry of IMF

Part 4.

# CONCLUSIONS

# CONCLUSIONS

[ Strategic plan for the six-year period 2018 to 2023 ]

SD	PI Index	PI Name
SD 3 - Response to climate change	PI 3.1	# tonnes of CO <sub>2</sub> emissions from international shipping

[ List of outputs for the 2022 to 2023 biennium ]

SD	Output	Description
SD 3 - Response to climate change	3.2	Further development of mechanisms needed to achieve the reduction of GHG emissions from international shipping
	3.4	Promotion of technical cooperation and transfer of technology relating to the reduction of GHG emissions from ships

# CONCLUSIONS

[ Draft strategic plan for the six-year period 2024 to 2029 ]

SD	PI Index	PI Name
SD 3 - Respond to climate change and reduce greenhouse gas emissions from international shipping	3.1	# tonnes of CO <sub>2</sub> emissions from international shipping
	3.4	% of ships per ship type with a C, B or A Carbon Intensity Indicator (CII) rating

1) C 129/WP.7 20 July 2023 - STRATEGY, PLANNING AND REFORM (a) Strategy and planning Report of the Working Group on the Strategic Plan

# CONCLUSIONS

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[ORIGINAL]

## CII REDUCTION FACTORS GUIDELINES, G3

- 4.1 ~ Z is general reference to the reduction factors for the required annual operational CII of ship types from year 2023 to 2030, as specified in table 1.



# CONCLUSIONS

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[REVISED]

## CII REDUCTION FACTORS GUIDELINES, G3

- 4.1 ~ Z is general reference to the reduction factors for the required annual operational CII of ship types from year 2023 to 2030, as specified in table 1.
- 4.2 If ship sails more than 40% in ballast condition of its total sailing, applies Z\* as specified in table 2.**

# CONCLUSIONS

YEAR	Less than 40% in ballast condition	More than 40% in ballast condition
2023	5%	9%
2024	7%	11%
2025	9%	13%
2026	11%	15%



**Strengthen** the required values  
to the vessel which sails **more than 40% of its total sailing in ballast condition**

# CONCLUSIONS

YEAR	Less than 40% in ballast condition	More than 40% in ballast condition
2023	5%	9%
2024	7%	11%
2025	9%	13%
2026	11%	15%

The **unfairness in the method of calculating the rating of the CII regulation** that occurred according to the type of voyage of the ship **disappears.**



Strengthen the required values  
to the vessel which sails **more than 40% of its total sailing in ballast condition**

# CONCLUSIONS

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[ORIGINAL]

## MARPOL 73/78 ANNEX VI

- 28.7 A ship rated as D for three consecutive years or rated as E shall develop a plan of corrective actions to achieve the required annual operational CII.
- 28.10 Administrations, port authorities and other stakeholders as appropriate, are encouraged to provide incentives to ships rated as A or B

# CONCLUSIONS

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[REVISED]

## MARPOL 73/78 ANNEX VI

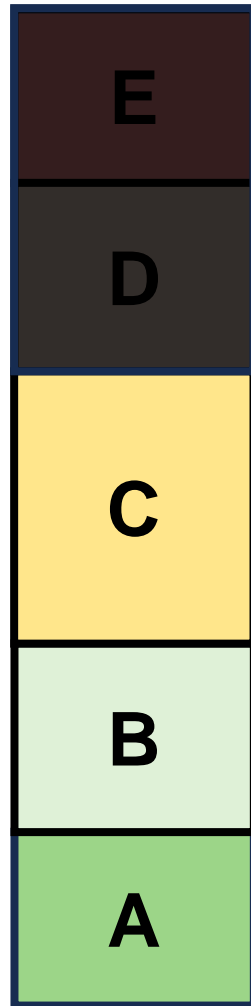
28.7 A ship rated as D for three consecutive years or rated as E shall develop a plan of corrective actions to achieve the required annual operational CII.

**28.7.1 A ships rated D and E will not benefit from the GHG levy.**

28.10 Administrations, port authorities and other stakeholders as appropriate, are encouraged to provide incentives to ships rated as A or B


**28.10.1 A ships rated A, B, C are scored on a different scale according to the LEVY TABLE and Those ships are eligible to benefit from the GHG Levy.**


## CONCLUSIONS



Under these sanctions,  
shipowners would  
**try their ships to be rated** as A, B, or C grade  
thereby the number of D or E grade ships  
would be **reduced**.

# CONCLUSIONS

PROBLEMS	SOLUTIONS
Lack of equity	<div>Introduction of measures to resolve the unfairness of each type of ship voyage</div> <div></div> <div>Incentive for GHG Levy to compliance vessel</div>



MORE  
EFFECTIVE  
APPLICATION

Part 5.


# FURTHER





## FURTHER





Despite these improvements, there are problems in the application of CII regulations to all ships, such as wandering to receive higher grades.

International management and cooperation are needed for more general application and problem solving.

So, discussion at various stages are needed.

Thank you.



# Reference

RESOLUTION MEPC.336(76) – 2021 GUIDELINES ON OPERATIONAL CARBON INTENSITY INDICATORS AND THE CALCULATION METHODS (CII GUIDELINES, G1)

RESOLUTION MEPC.337(76) – 2021 GUIDELINES ON THE REFERENCE LINES FOR USE WITH OPERATIONAL CARBON INTENSITY INDICATORS (CII REFERENCE LINES GUIDELINES, G2)

RESOLUTION MEPC.338(76) – 2021 GUIDELINES ON THE OPERATIONAL CARBON INTENSITY REDUCTION FACTORS RELATIVE TO REFERENCE LINES (CII REDUCTION FACTORS GUIDELINES, G3)

RESOLUTION MEPC.339(76) – 2021 GUIDELINES ON THE OPERATIONAL CARBON INTENSITY RATING OF SHIPS (CII RATING GUIDELINES, G4)

RESOLUTION MEPC.355(78) – 2022 INTERM GUIDELINES ON CORRECTION FACTORS AND VOYAGE ADJUSTMENT FOR CII CALCULATIONS (CII GUIDELINES, G5)

RESOLUTION MEPC.337(80) – 2023 IMO STRATEGY ON REDUCTION OF GHG EMISSIONS FROM SHIPS

RESOLUTION MEPC.304(72) - INITIAL IMO STRATEGY ON REDUCTION OF GHG EMISSIONS FROM SHIPS

RESOLUTION A.1149(32) - REVISED STRATEGIC PLAN FOR THE ORGANIZATION FOR THE SIX-YEAR PERIOD 2018 TO 2023

MEPC 78/17 24 June 2022 – REPORT OF THE MARINE ENVIRONMENT PROTECTION COMMITTEE ON ITS SEVENTY-EIGHT SESSION

MEPC 80/WP.1/Rev.1 14 July 2023 – DRAFT REPORT OF THE MARINE ENVIRONMENT PROTECTION COMMITTEE ON ITS EIGHTIETH SESSION

ISWG-GHG 15/WP.1 30 June 2023 – Draft report of the fifteenth meeting of the Intersessional Working Group on Reduction of GHG Emissions from Ships (ISWG-GHG 15)

C 129/WP.7 20 July 2023 - STRATEGY, PLANNING AND REFORM (a) Strategy and planning Report of the Working Group on the Strategic Plan

MARPOL 73/78 Annex VI

UK Merchant shipping act 1995

"CII 규제 대응 지침서 (October 2021)", KR

"Transition 2050 Greener Strategy (October 2021)", KR

"KR Homepage \_ Decarbonization & Digitalization \_ Decarbonization \_ GHG Verification \_ CII", KR

"CII IS NOT THE ANSWER – WHAT DO WE DO NOW? (7<sup>th</sup> December 2022)", Scott Bergeron of OLENDORFF CARRIERS

"Calculation Method of Marine Ship Fuel Consumption (2020)", Jing Li, Yuanming Jia

"CII is unfair to all ships : Union of Greek Shipowners (Feb 13, 2023)", David Glass of Seatrade Maritime New

"Vol.07 - 탈탄소화 국제해사 동향 (2023)", KMC

"Revealed preferences for energy efficiency in the shipping markets (2016)", UCL ENERGY INSTITUTE

"FIVE THINGS TO KNOW ABOUT CARBON PRICING (2021)", Ian Perry of IMF