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REDUCTION OF GHG EMISSIONS FROM SHIPS

Application of the CII $FC_{electrical,j}$ correction factor to refrigerated underdeck cargo

Submitted by Bahamas and ICS

SUMMARY

Executive summary:	With respect to the G5 interim guidelines within the Carbon Intensity Indicator (CII) rating system, this document presents a proposal to add refrigerated cargo carriers to the scope of application of the $FC_{electrical,j}$ correction factor. The co-sponsors seek the Committee's consideration and possible adoption.
Strategic direction, if applicable:	3
Output:	3.2
Action to be taken:	Paragraph 16
Related documents:	MEPC 78/17; resolutions MEPC.353(78) and MEPC.355(78) and MEPC 78/7/11

Introduction

1 MEPC 77 (June 2021) adopted the IMO Carbon Intensity Indicator (CII) framework. The system will come into force on 1 January 2023. As this framework required substantive guidance to support its implementation, the Committee established a correspondence group to develop a package of guidelines. MEPC 78 (June 2022) adopted a package of five resolutions setting out the supporting guidelines for the CII framework.

2 While developing these guidelines, many proposals were made for correction factors, which are critical to ensure an accurate calculation of emissions and avoid unintentional effects of seriously disadvantaging certain ship types and creating perverse incentives. Most of these proposals ultimately were not accepted by the Committee, however, this was a function of the significant time pressures of the wider complex discussions at MEPC 78 and for guidelines to be in place in time for the CII framework's implementation on 1 January 2023.

3 The co-sponsors note that many delegates supported proposals that were made at ISWG-GHG 12 and MEPC 78 to allow critical adjustments to be made to the *2022 Interim*

guidelines on correction factors and voyage adjustments for CII calculations (CII Guidelines, G5) (resolution MEPC.355(78)) before the framework's entry into force.

4 Reefer container ships and other ship types (e.g. LNG carriers or gas carriers) that need to cool their cargo do have a correction factor $FC_{electrical,j.}$ However, refrigerated cargo carriers may carry reefer containers on deck, but also palletized refrigerated cargo below decks. The cooling load attributable to this below deck cargo should therefore be subject to a correction factor as well.

5 This document explains the breadth of operations that refrigerated cargo carriers routinely engage upon, which would not be fairly represented in the single baseline for this group of ships. The proposal is to introduce a correction factor relating to the energy applied to cooling of cargo, and operation of controlled atmosphere devices. The justification is the same as that giving rise to the correction factor for refrigerated containers, and LNG carriers.

6 The co-sponsors acknowledge the fleet-wide data which generates the CII baseline. Nonetheless this type of ship is employed in a wide spectrum of situations, which range from the use of no fuel for refrigeration (e.g. carrying general or hazardous cargoes for which these ships are well suited), through to "closed" operation where there is only maintenance of temperature and therefore "moderate" consumption in this respect, through to "open" operation where air exchange (required for the health of the cargo), means that consumption for refrigeration and fans is acute. Over and above this, there may be the operation of controlled atmosphere devices on some legs, or not others.

7 All these different employments, based on a single baseline with no correction factor, will mean that certain trades will be heavily penalized as can be seen in figure 1 below. In parallel to this, the fact that the same refrigerated cargoes can plausibly be shipped in refrigerated containers, for which there is a correction factor, will mean that CII will unfairly influence charterers to choose to transport refrigerated goods by container ship, rather than by refrigerated cargo ship with below deck cargo spaces. In other words, the CII system will be creating an unlevel playing field between these two types of ships.

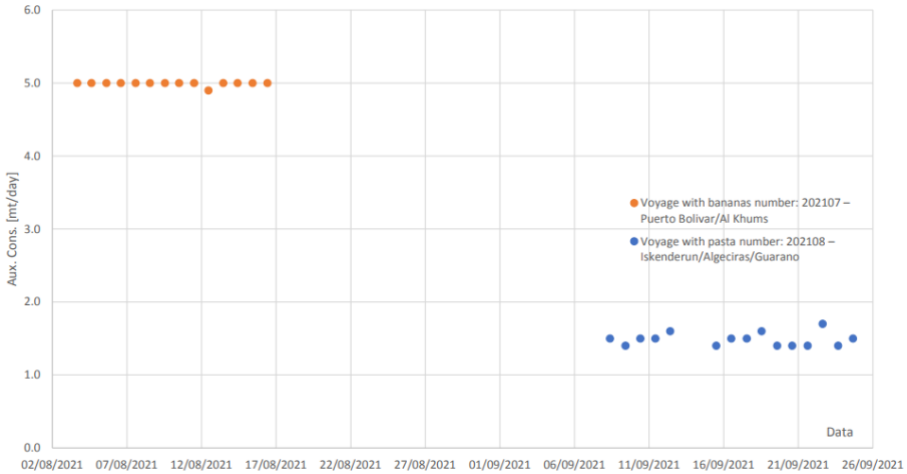

Figure 1: Example of fuel consumption for auxiliary power to cool different cargoes on the same ship

8 The co-sponsors' proposal is for the application of the correction factor $FC_{electrical,j}$ to be extended to the cooling load attributable to below deck refrigerated cargoes. This would be calculated either from documented direct measurements of the energy consumed by the refrigeration, ventilation, and controlled atmosphere plant, or in the absence of such means, by the application of the nominal rating of the plant operating in the mode and set temperature

of the voyage, as in the formula inserted below. The rationale, and practical application, is identical to that applied for reefer containers.

9 As can be seen in figure 2, there currently is only a slight benefit from the reefer container correction factor for refrigerated cargo carriers, as illustrated by the difference between the light blue line (no correction factor) and dark blue line (correction factor for reefer containers). Whereas the lowest line, which includes the combined correction for both reefer containers and refrigerated under deck cargo clearly demonstrates the bigger potential benefit in CII rating when all the cooling load is included. It is also worth noting that cooling the underdeck cargo amounts to 30% to 60% of auxiliary engine power output as compared to just 0% to 25% for the cooling of (reefer) containers. This again illustrates the dominant effect of the under-deck cooling load and therefore its importance within the calculation of the correction factor.

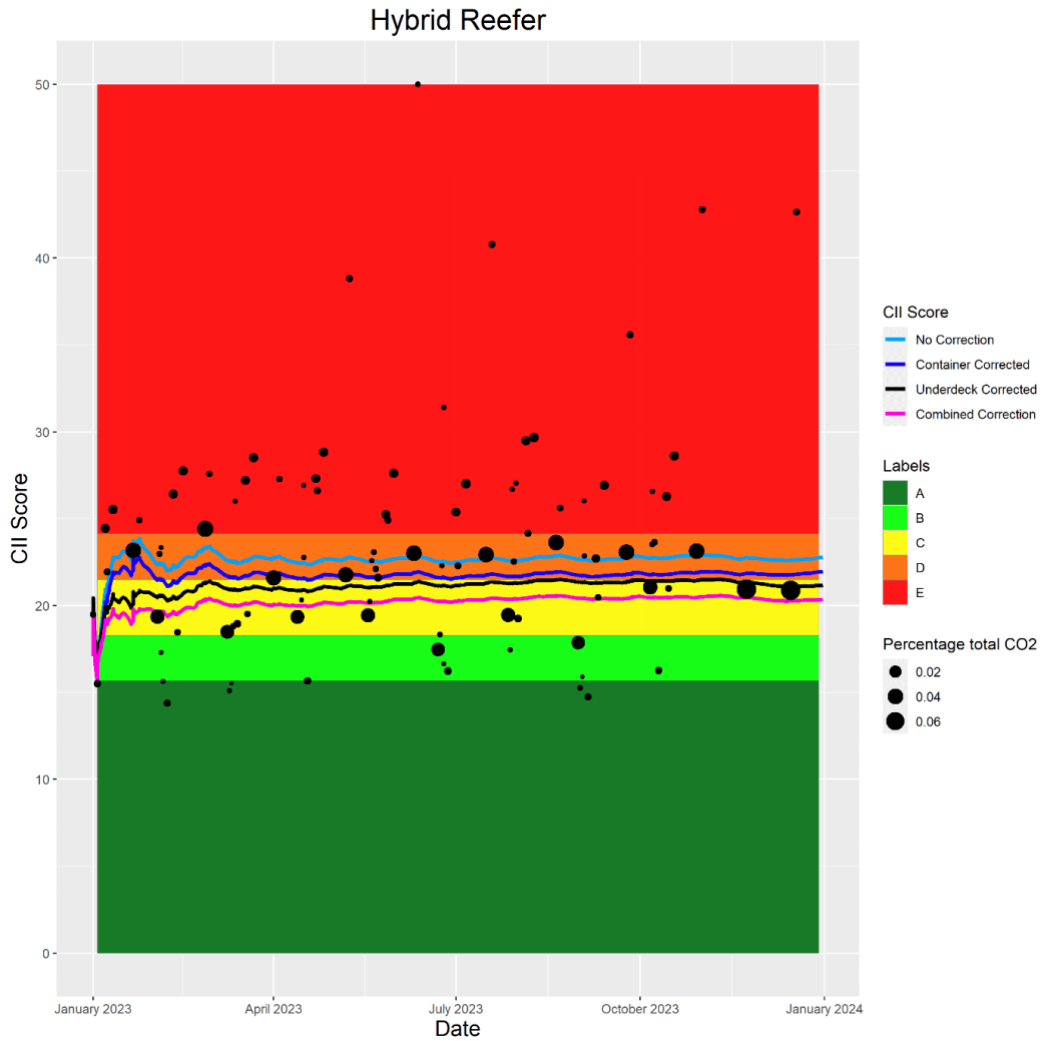

Figure 2: showing the differences between the CII scores with and without correction factors for underdeck cargo cooling of a hybrid refrigerated cargo carrier

Discussion

10 During discussions within the Correspondence Group on Carbon Intensity Reduction, ISWG-GHG 12, and in the Committee's consideration of the Group's interim report to MEPC 77, several Member States spoke favourably on the adoption of further correction

factors and voyage adjustments to fairly accommodate the wide-ranging ship types, routes and modes of operation.

11 It was agreed during MEPC 78 that the cooling of cargo with the auxiliary power used for reefer containers is subject to a correction factor for CII calculations under the interim G5 guidelines.

12 A correction factor for cooling of underdeck cargo on board refrigerated cargo carriers was not discussed nor considered in earlier meetings.

13 Not allowing the application of $FC_{electrical,j}$ to the cooling of underdeck cargo would be an omission, as it is a very analogous situation to the cooling load for reefer containers and for LNG carriers.

Proposal

14 Taking note of the information and analysis provided in this submission, the co-sponsors are of the view that the power used to cool and/or freeze all cargo on board refrigerated cargo carriers should also be included within the scope of the $FC_{electrical,j}$ correction factor, and the G5 guidelines should be amended accordingly.

15 Proposed draft amendments to the interim G5 guidelines are set out in the annex to this document to facilitate the Committee's consideration and possible adoption. The suggested amendments, the addition of the words 'refrigerated cargo carriers', is shown underlined in the annex to this document.

Action requested of the Committee

16 The Committee is invited to consider the proposals set out in this document, as summarized in paragraphs 14 and 15, and to take action as appropriate.

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ANNEX

PROPOSED AMENDMENTS TO THE *2022 GUIDELINES ON THE CORRECTION FACTOR AND VOYAGE ADJUSTMENTS (CII REFERENCE LINES GUIDELINES, G5)*

CONTENTS

[…]

4.3 $FCelectrical,j$ for corrections relating to electrical power

The parameter $FC_{electrical,j}$ is the mass (in grams) of fuel of type j, consumed for production of electrical power during the calendar year which may be deducted from the calculation of the attained CII for the following purposes:

.1 Electrical consumption of refrigerated containers (on all ships where they are carried) using the calculation methodology specified in part A of appendix 1.

.2 Electrical consumption of cargo cooling/reliquefaction systems on gas Carriers, refrigerated cargo carriers and LNG Carriers.

.3 Electrical consumption of discharge pumps on tankers.