



MARINE ENVIRONMENT PROTECTION
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PREVENTION OF AIR POLLUTION FROM SHIPS

A mandatory CO₂ Design Index for new ships

Submitted by Denmark, Marshall Islands, BIMCO, ICS, INTERCARGO,
INTERTANKO and OCIMF

SUMMARY

Executive summary: The shipping industry has continuously endeavoured to optimize fuel consumption. However, there is still a potential for further improvement. To create a stronger incentive, this document proposes the development of a mandatory CO₂ design index for new ships. The index reflects only the technical performance of the ship and its engine, and not operational or commercial aspects.

Action to be taken: Paragraph 16

Related documents: MEPC 57/4/2 and MEPC 57/INF.12

Introduction

1 IMO Assembly resolution A.963(23) on “IMO Policies and Practices Related to the Reduction of Greenhouse Gas Emissions from Ships” urged the MEPC to identify and develop the mechanisms needed to achieve limitation or reduction of Greenhouse Gas (GHG) emissions from international shipping, to give priority to the establishment of a GHG emission baseline, and to the development of a methodology to describe the GHG efficiency of a ship, in terms of a GHG emission index. In developing the methodology for the GHG emission indexing scheme, the Committee should recognize that CO₂ is the main greenhouse gas emitted by ships.

2 As urged by the Assembly, MEPC 53 approved Interim Guidelines for Voluntary Ship CO₂ Emission Indexing for Use in Trials, described in document MEPC/Circ.471. It was decided to update the Interim Guidelines at a later stage, taking into account operational experiences from trials of the index for different ship types, as reported to MEPC by industry, organizations and Administrations, and any other relevant developments.

3 The interim guidelines presented the concept of an index for the energy efficiency of a ship in operation expressed in terms of CO₂ emitted per unit of transport work. The index should represent the efficiency of ship operation over a longer period of time, and be based on records of the actual amount and type of fuel consumed, the actual distance travelled, and the actual amount of cargo carried. Thus the index would measure technical, operational and commercial aspects, and would require a significant amount of data collection, reporting, verification, processing, and filing.

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Objective

4 The shipping industry has continuously endeavoured to optimize its fuel consumption and thereby indirectly caused a reduction in CO₂ emissions from individual ships. In this manner, market forces themselves have led to a significant increase in energy efficiency over the last 25 years due to more efficient machinery, optimized hull design, larger ships, etc.

5 However, there is still a potential for further improvement. The sponsors believe that there is a need to explore existing technology which has yet to be implemented on board ships perhaps due to reliability concerns or commercial factors.

6 The objective of this document is, therefore, to recommend the development of a mandatory CO₂ design index for new ships, which separates technical and design based aspects from the more diverse operational and commercial aspects.

7 The purpose of such a CO₂ design index is to provide a fair basis for comparison, to stimulate the development of more efficient engines and ships and in general to improve the efficiency of all ships.

8 It is not the intention of this document to discuss all of the complexities surrounding the development of a mandatory CO₂ design index for new ships, nor to propose target values, but to address the main assumptions that will have to be made and to identify basic parameters that should be addressed.

Basic principles for a mandatory CO₂ design index for new ships

9 Focusing on various stakeholders with influence on emissions, potential reductions can be divided into technical measures (in the hands of the engine manufacturer, the yard or the designer) and operational and commercial measures (in the hands of the ship operator and the charterer).

10 Technical measures include use of non-fossil fuels as well as further optimization of engines, hull and propeller. Operational measures include, *inter alia*, better utilization of cargo capacity, better voyage planning to strike the right balance between time spent underway and fuel consumption, and better linkage to shore based sections of the transport chain.

11 Drawing an obvious parallel with the car industry, the technical measures are clearly in the hands of the car manufacturer. The manufacturer can optimize the design for better fuel economy, test it under certain standardized conditions, label it, and use this information to increase car sales. Merely because technical and operational measures are separated, the customer is able to compare the standardized fuel economy of various cars, when choosing, and regulators are in a position to set minimum standards. Operational measures are in the hands of the consumer and stimulated by other means.

12 In establishing a mandatory CO₂ design index for new ships (and exploring its possible application for existing ships), the sponsors find that any CO₂ indexing method for new ships should comply with the following basic requirements:

- it should address relevant technical measures;
- it should be simple to employ;

- it should be consistent (to avoid interpretation of results); and
- it should be based on a generally accepted methodology.

Analysis of performance parameters

13 A mandatory CO₂ design index for new ships appears to be a feasible policy instrument to reduce greenhouse gas emissions. It is considered that the effectiveness and impact of such an instrument will indeed be limited initially, mainly due to its likely application to new ships only. There is, however, considered to be a potential for a significant environmental impact over time, in particular if mechanisms are applied promoting behaviour beyond compliance.

14 Furthermore, the sponsors are convinced that a mandatory CO₂ design index for new ships can be developed on the basis of a few reliable parameters separating technical and design based aspects from operational and commercial aspects.

15 Finally, the sponsors are confident that a relatively straightforward legal instrument can be drafted establishing the requirement for new ships to meet design parameters that yield an index that is at or below a benchmark defined at an international level.

Action requested of the Committee

16 The Committee is invited to consider the information provided in this document and to endorse a work process aiming at the development of a mandatory CO₂ design index for new ships.
