



International and European Regulation on Ammonia as an Alternative Fuel in Shipping

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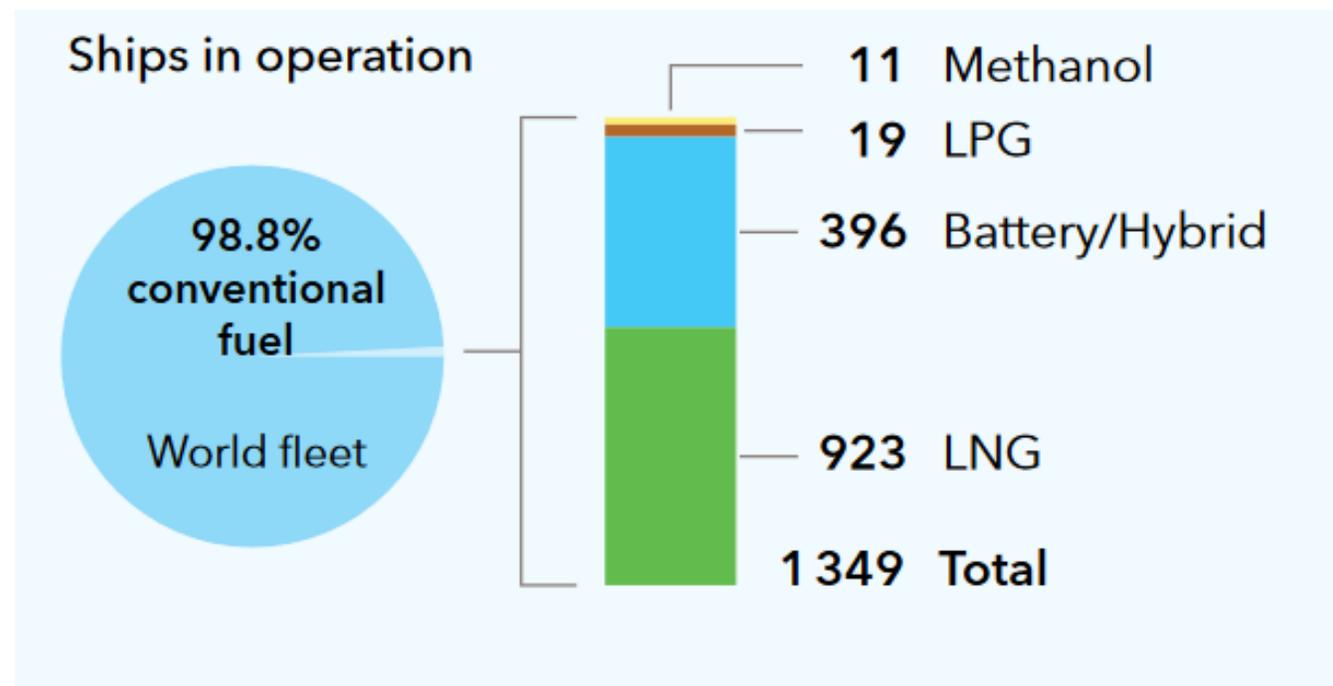
1. Regulatory Toolbox for GHG reductions in the Shipping Sector
2. Market-based Measures
3. Technical Approval for Sea-Going Vessels
4. Conclusion

The Shipping Sector in Numbers

Global CO2 Emissions of the Shipping Sector in 2020



Conventional Fuels in the World Fleet



Taking Action on the International and European Level



Initial IMO Strategy on Reduction of GHG Emissions from Ships

Reduction of total annual emissions by at least **50% by 2050**; to be achieved by reducing CO₂ emissions per transport unit in international shipping by at least 40% on average by 2030 and targeting a 70% reduction by 2050



Green Deal: Fit for 55 Package

EU sustainable and smart mobility strategy aims at 90% GHG emission reduction from today's levels until 2050



Fuel EU-Maritime initiative

Increasing the demand for and furthering the consistent use of renewable and low carbon fuels

Instruments to reduce GHG Emissions

Market-based Instruments

Increase the competitiveness of alternative fuels

Int. levy System

Emissions Trading System

Operational Requirements

Requirements e.g. regarding fuel GHG intensity

Carbon Intensity Indicator

GHG Fuel Standard

Regulation on Efficiency

Design requirements for new/existing ships for ideal carbon intensity

Energy Efficiency Existing Ship Index

Energy Efficiency Design Index



Technical Approval and Construction Requirements

Sufficient reflection of the use of alternative fuels in shipping

SOLAS, IGC/IBC/IGF Code

CESNI/ ESTRIN

Fuel Supply System

Sufficient Infrastructure and introduction of quotas

AFIR/TEN-E

RED III

2023: Setting the future framework for shipping



MEPC 80 (3-7 July 2023)



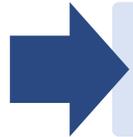
FuelEU Maritime	Provisional agreement reached on 23.3.2023
AFIR	Provisional agreement reached on 27.3.2023
RED III	Provisional agreement reached on 30.3.2023
ETS	Provisional agreement reached on 18.12.2022





Market-based measures (MBMs)

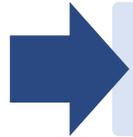
Several proposals that differ in various respects:



How is revenue raised: trade or levy?

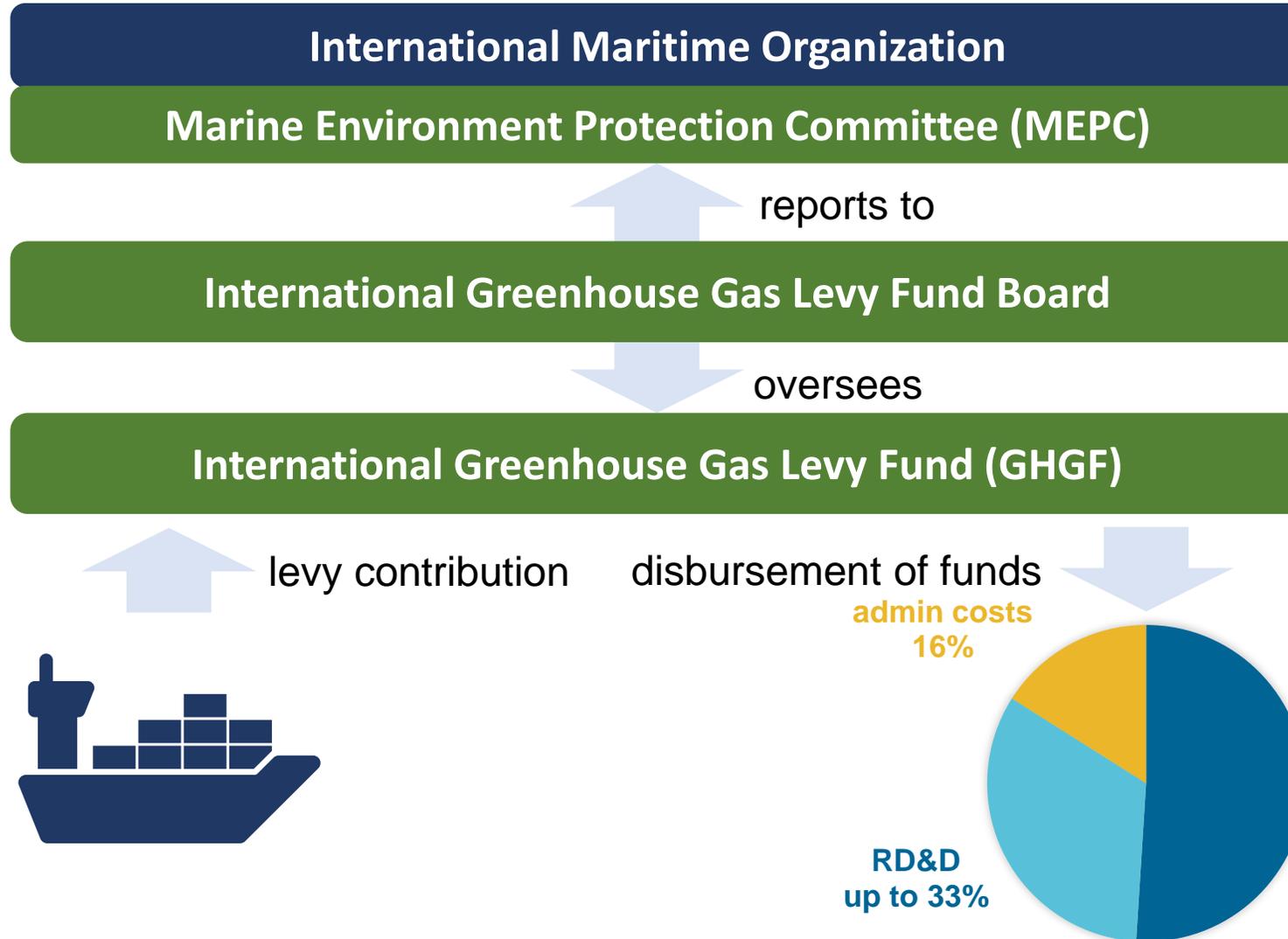


What is the revenue based on: GHG, CO₂, WtW, TtW emissions or fuel consumption?



How is revenue disbursed: rebate, R&D, capacity building?

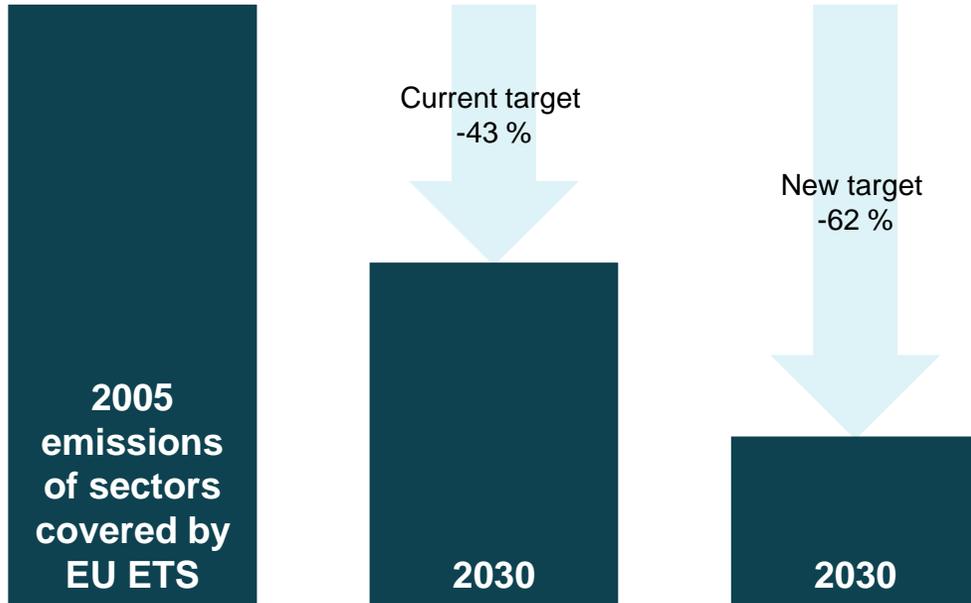
Proposed GHG levy



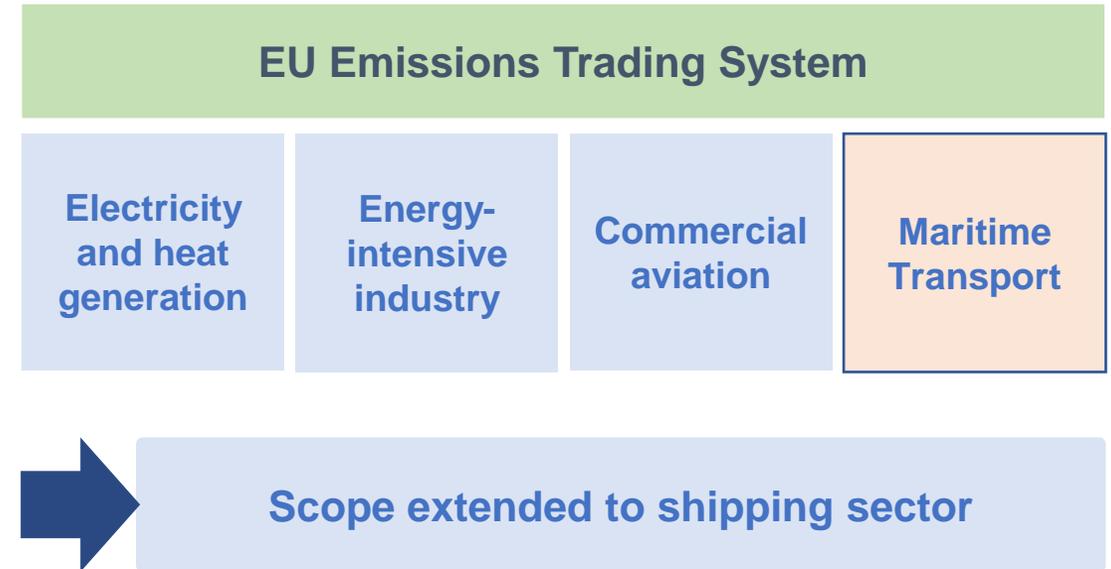
EU Emissions Trading System



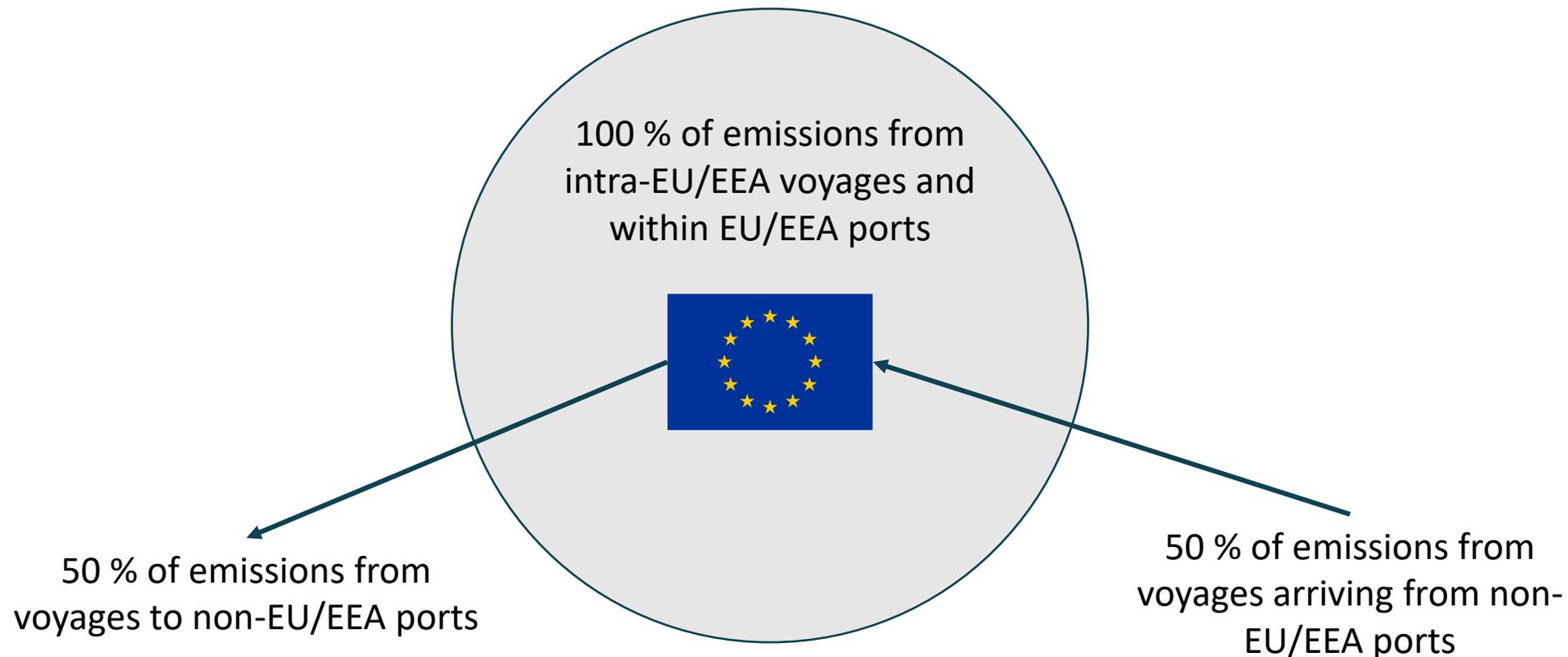
Overall ambition



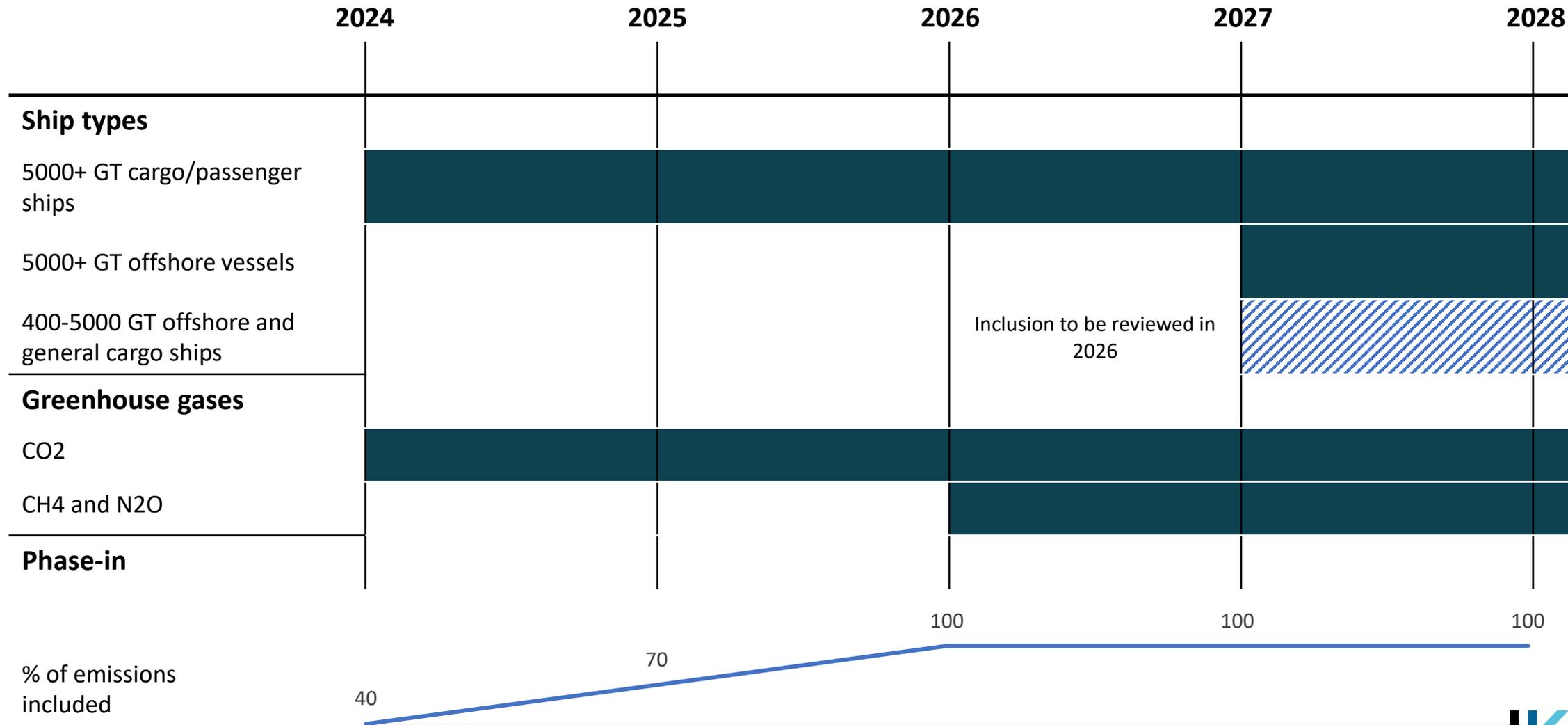
Inclusion of maritime sector



EU ETS Maritime: Geographical scope



EU ETS Maritime Timeline



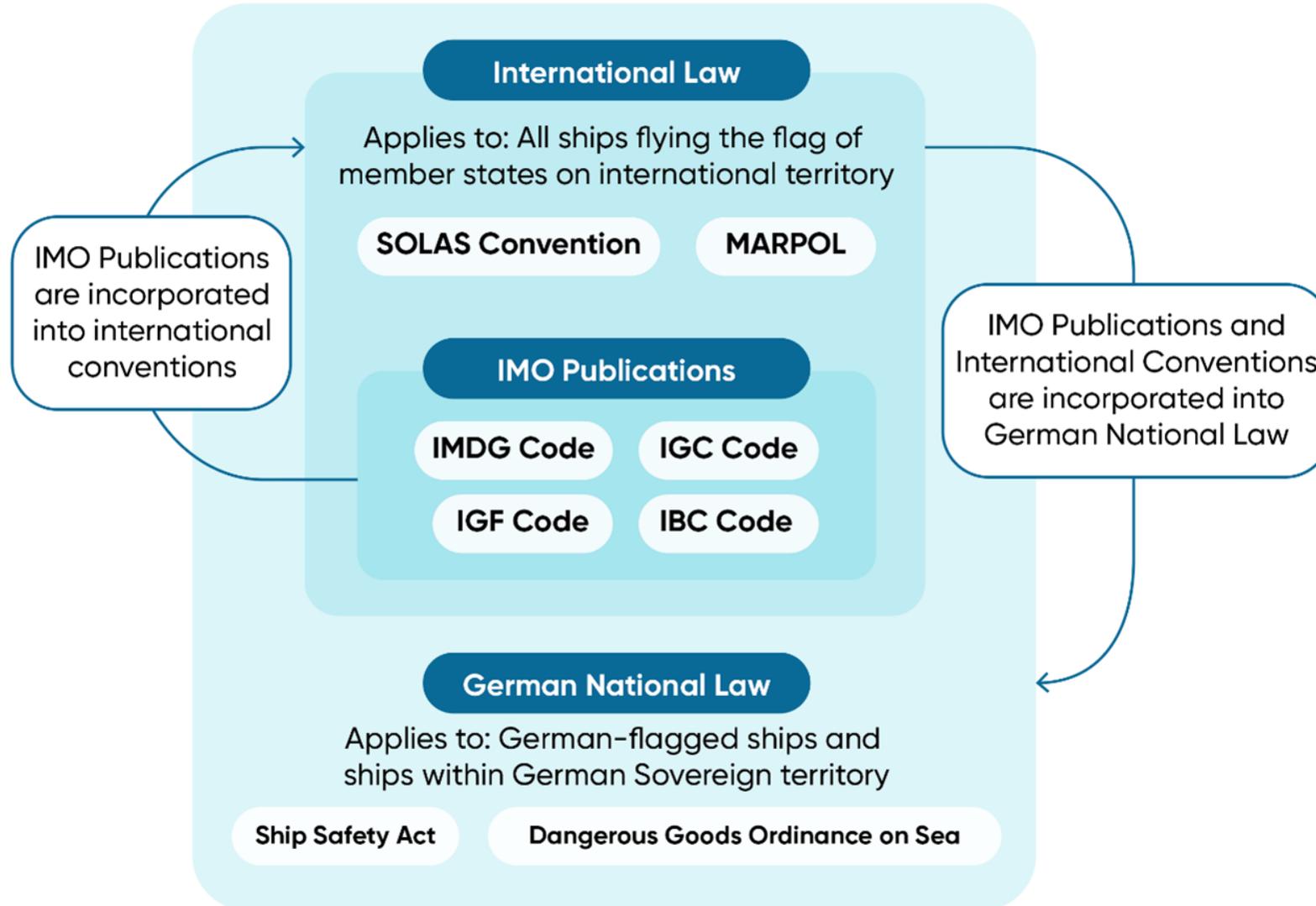
Source: own illustration based on [DNV](#).



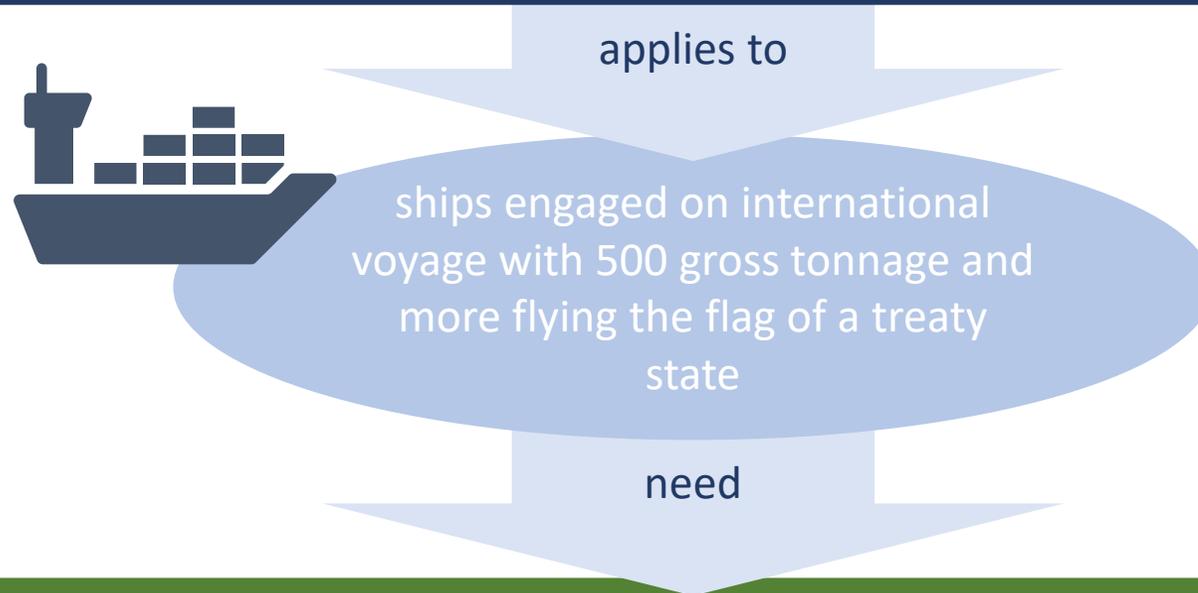


Technical approval for sea-going vessels

Regulatory Framework



International Convention for the Safety of Life at Sea (SOLAS Convention)



Ship Safety Certificate(s)

proof of compliance with the respective relevant requirements of SOLAS

SOLAS Convention and IMO Regulation



International Convention for the Safety of Life at Sea (SOLAS Convention)

refers to

International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code)

refers to

International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk (IBC Code)

refers to

International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code)



ammonia has no identifiable flashpoint

all regulation and codes contain construction requirements fitted for the use of conventional fuel systems

Ships using alternative fuels such as ammonia in general can not obtain the required Ship Safety Certificate

Alternative Design Approach



adequate and equivalent level of safety

Reg II-2/17 SOLAS

2.3 IGF Code

IMO Guidelines MSC.1/Circ. 1212 and 1455

IACS Recommendations

1

Preliminary Hazard Identification (HAZID)

Risk assessment to ensure all risks occurring from the alternative design regarding people on board, the environment, the construction and integrity of the ship are addressed

2

Engineering analysis

Based on the IMO Guidelines

3

Evaluation and approval

Engagement with all stakeholders through a stakeholder process



approval of alternative fuel designs



IMO Guidelines currently do not specifically represent the construction needs for the use of alternative fuels



IMO works on guidelines for the use of ammonia and hydrogen as maritime fuel – expected 2023/2024



The lack of standardised guidelines and procedures lead to lengthy approval processes during which each ship must be examined and assessed on an individual case-by-case-basis



IMO approach to accompany innovation technologies with guidelines rather than hinder with ill-suited regulation



Ammonia as a toxic substance currently cannot be used as a fuel on gas carriers within the scope of the IGC Code (16.9.2 IGC Code)



Conclusion

Developments in the Shipping Sector under way

Market-based Mechanisms

technical approval

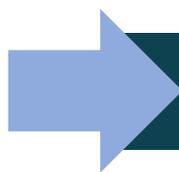
 **IMO:** Possible introduction of a levy system, decision expected in 2023

 **EU:** Inclusion of the Maritime Sector soon to be finalized

 **IMO:** Interim guidelines for the use of methanol


Successive facilitation and standardization of approval processes for ships with alternative propulsion technologies by means of guidelines

 guidelines for the use of **ammonia** and hydrogen in progress which in medium-term are to be implemented in the IGF Code

 Shipping sector to gain innovative and regulatory speed – much to be expected until 2025

Thank you for your attention!



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