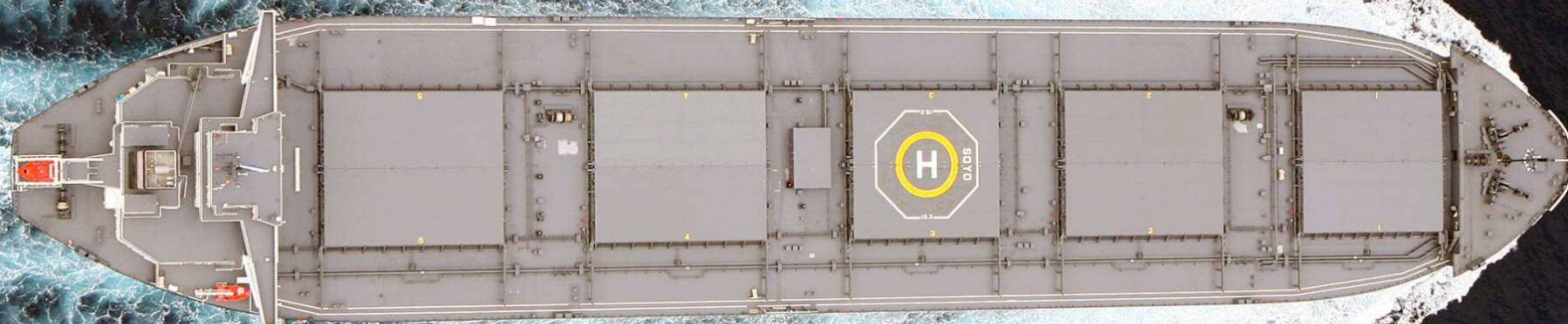


# Ship Design for EEDI Phase 3 and Beyond



October 23, 2018  
12th ASEF Forum @Dalian



# Background

**In April 2018, the initial IMO strategy on reduction of GHG emissions from ships was adopted at the 72<sup>nd</sup> meeting of the Marine Environment Protection Committee (MEPC 72).**



# Ambitious targets

**Absolute targets for GHG emissions reduction across the international shipping were set for the first time after the time-consuming and serious discussions in IMO since 1990s.**

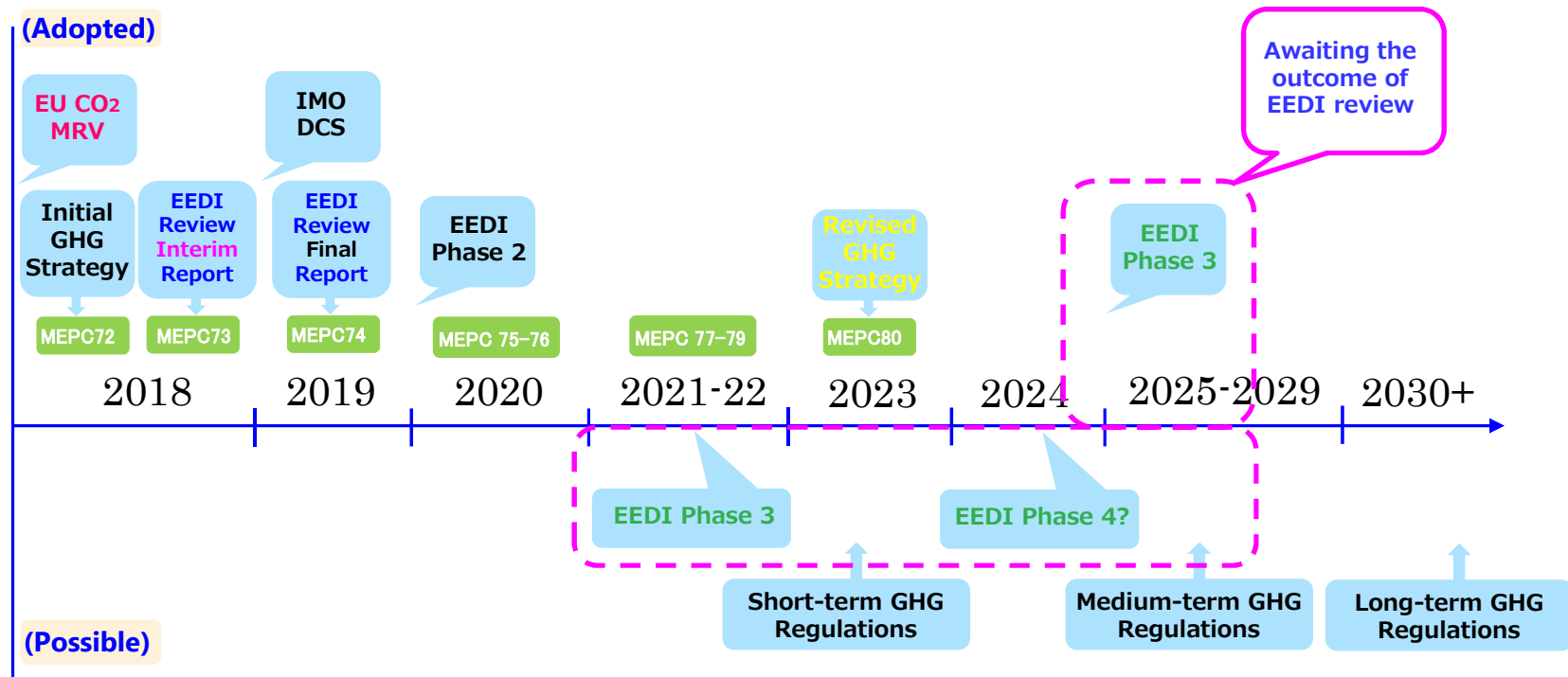
(Reference year : **2008**)

Target	2030	2050	2100
Transport Efficiency	+ 40%	+ 70% *)	
Annual GHG emissions		- 50%	0 !!

\*) Non-mandatory but a target

# Regulatory Timeline

A revised IMO strategy to be adopted in 2023, and possible measures of short-, medium- and long-term to be finalized and agreed based on the following timelines.



# Candidate measures proposed

**Candidate short-, mid- and long-term measures were listed over broad categories, among which shipbuilders might play a major role to the following items:**

- **Further improvement of energy efficiency for new ships to cope with the enhanced EEDI regulations, as well as the requirements by SEEMP regulations**
- **Facilitating R&D activities on development of technologies for introducing alternative low-carbon and zero-carbon fuels to ships**

# EEDI regulation

**Energy Efficiency Design Index (EEDI), with a simplified definition as**

$$EEDI = \frac{P \times SFC \times C_F}{DWT \times V_{ref}}$$

where, *P*: Installed power; *SFC*: Specific fuel consumption;  
*C<sub>F</sub>*: Carbon conversion factor; *V<sub>ref</sub>*: Reference speed

- **Adopted at MEPC 62, July 2011**
- **Applied to new ships with 400GT and above since 2013**
- **Time periods and EEDI reduction rates were preset toward Phases 0-3 for each ship type.**

# Preset EEDI requirements

(Reduction rates in percentage)

	<b>Phase 0 2013 ~</b>	<b>Phase 1 2015 ~</b>	<b>Phase 2 2020 ~</b>	<b>Phase 3 2025 ~</b>
Bulker, Gas carrier, Tanker, Container	<b>0</b>	<b>10</b>	<b>20</b>	<b>30</b>
General Cargo, Reefer	<b>0</b>	<b>10</b>	<b>15</b>	<b>30</b>
LNG Carrier	<b>n/a</b>	<b>10</b>	<b>20</b>	<b>30</b>
PCTC	<b>n/a</b>	<b>5</b>	<b>15</b>	<b>30</b>
Ro-Ro, RoPax, Passenger	<b>n/a</b>	<b>5</b>	<b>20</b>	<b>30</b>

# EEDI requirements as of 2018

(Reduction rates in percentage)

To be finalized by 2019

	Phase 0 2013 ~	Phase 1 2015 ~	Phase 2 2020 ~	Phase 3 2025 ~
Bulker, Gas carrier, Tanker, Container	0	10	20	30
General Cargo, Reefer	0	10	15	30
LNG Carrier	n/a	10	20	30
PCTC	n/a	5	15	30
Ro-Ro, RoPax, Passenger	n/a	5	20	30



# Review on EEDI beyond Phase 2

At MEPC 71 (July 2017), the Correspondence Group (CG) on EEDI review re-established under the coordination of Japan.

The CG has submitted an interim report to MEPC 73 (October 2018), recommending EEDI Phase 3 as follows.

## Starting year

- Retain **2025** for Bulkers, Tankers, Ro-Ro, Ro-Pax
- **2022** for Container ships

## Reduction rates

- Retain **30%** reduction for all ship types

# Discussions on EEDI Phase 3

- **Persistent claims of early implementation of Phase 3, such as starting from 2022 for all ships and introduction of possible Phase 4**
- **Different opinions on the necessity of the modification of reference lines for large Bulkers and large Tankers**
- **New proposals to introduce reserved power for emergency situations in order to resolve the conflict between the minimum power for safety and the enhanced EEDI requirements**

# Beyond EEDI Phase 3

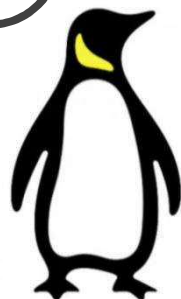
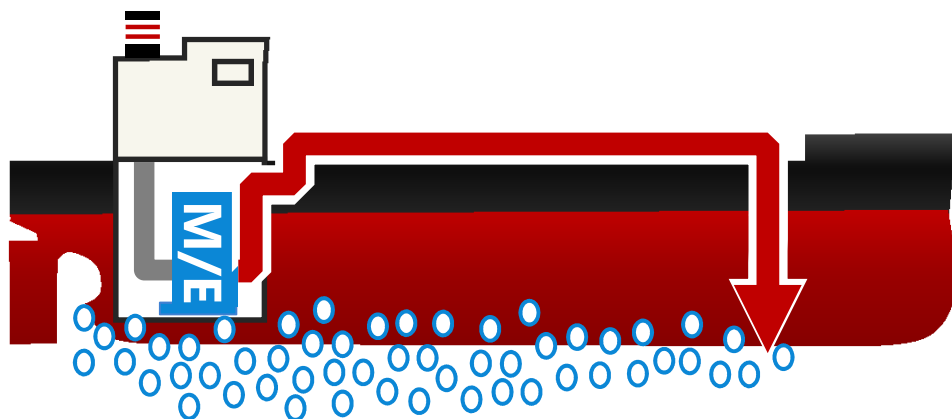
- **No commitment has been made so far.**
- **Possibly more stringent EEDI requirements to be introduced in view of IMO's GHG strategy**
- **Switching to lower carbon and carbon neutral alternative fuels to be inevitable for shipping industry to achieve the IMO's targets**
- **However, the industry is facing too many challenges including the technological solutions, the provision of a fuel supply infrastructure, fuel storage and its safety on board, etc.**

# Shipbuilder's responsibility and roles

- **Shipbuilders should continuously improve energy efficiency of ships by facilitating R&D and application of innovative technologies, including preparations for introducing alternative fuels, while keeping conventional optimization of ship design.**
- **Shipbuilders should also pay careful attention to the regulatory discussions in IMO, making constructive proposals or comments as appropriate through their member states or ASEF. Sometimes decision making regarding GHG issues in IMO to be more political than feasible!**

# R&D activities at Oshima

- Air Lubrication technology applied to M.V. "SOYO"



Length Overall	<b>235 m</b>
Breadth	<b>43 m</b>
Draught	<b>13 m</b>
Deadweight	<b>91,000MT</b>

# R&D activities at Oshima

## ➤ Wind Challenger Project



## ➤ LNG-fueled Bulker



An aerial photograph of a large cargo ship sailing on the ocean. The ship has a red hull and a black upper section. It features a large deck with several rectangular structures and a yellow helipad. The ship is moving from the top left towards the bottom right, leaving a white wake. The sky is clear and blue.

**THANK YOU**  
for your attention

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ASSOCIATION OF JAPAN