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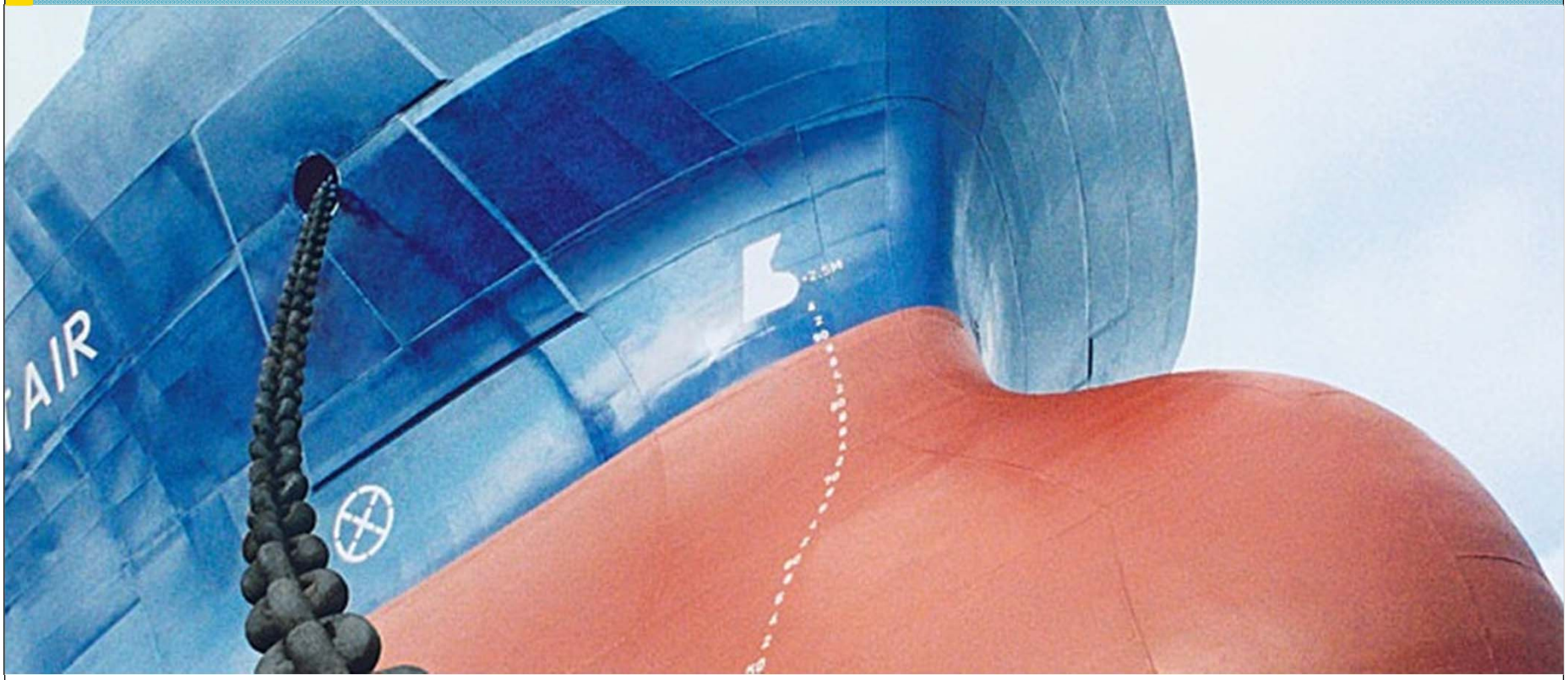
Abgasnachbehandlung
ECA developments on SOx and NOx



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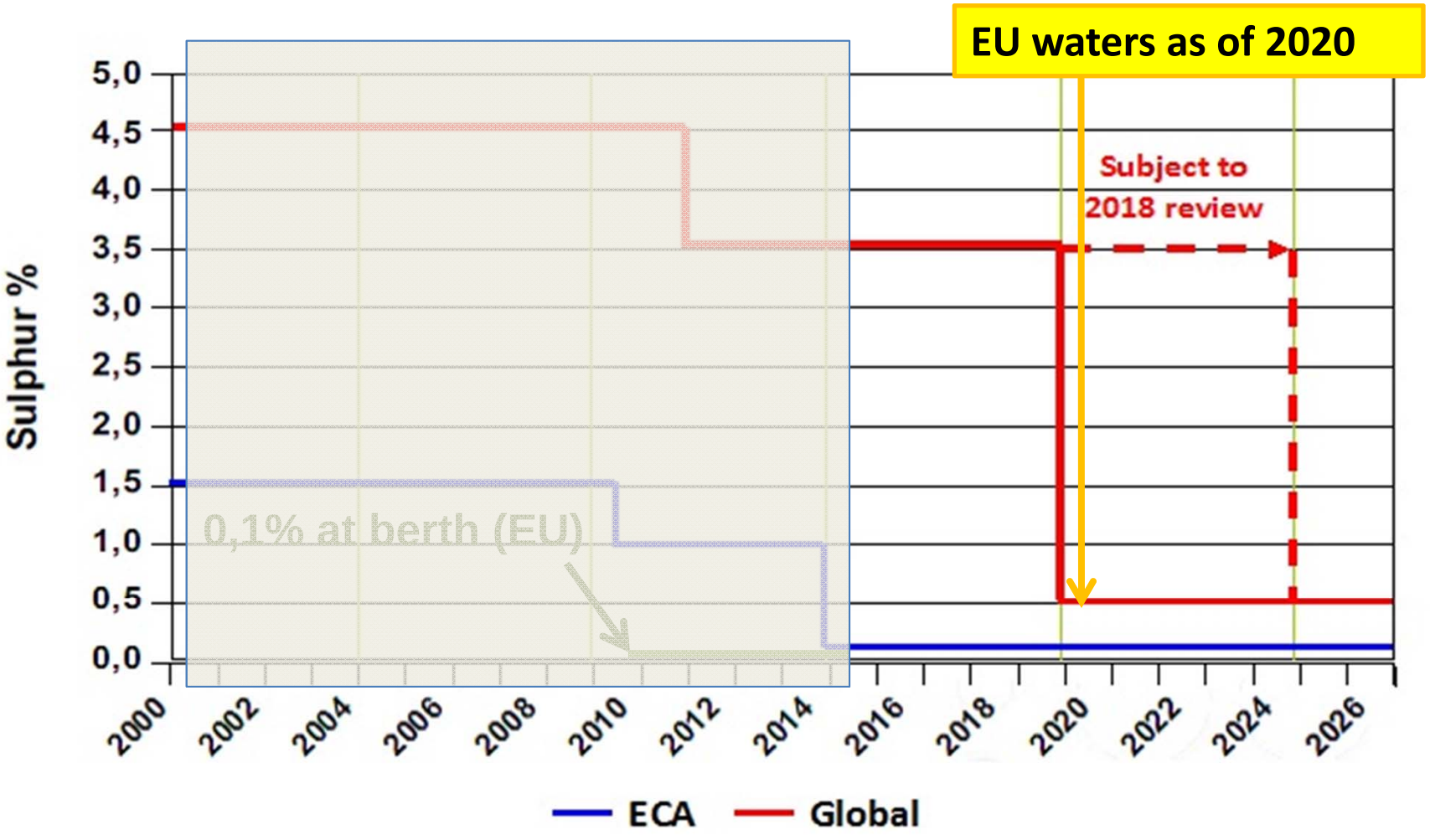
German Shipowners' Association

Contents

- **Sulphur regulations update**
- **Nitrogen emissions update**

VDR-Mariko-Workshop



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Experiences with low sulphur fuel

- Intensive preparations by ship operators
  - technical upgrades, documentary prep work (change-over-procedures), tank cleaning ….
- Successful change, yet not without technical challenges
  - (fuel pumps, injection valves, lubrication)
- German Maritime Agency – compliance checks
  - Control of documentation on board
  - remote sensing technology - Neuwerk und We >95 % compliance
- EU: mandatory sampling as of 2016
  - SWE / Thetis – S – Database

October 2014

Industry Guidance on Compliance with the Sulphur ECA Requirements

Assistance to ship owners, operators and crew

This Industry Guidance shall give assistance to ship owners, operators and crew to prepare for the changes in fuel characteristics and compliance with the new sulphur limits for ships fuel used in in Sulphur Emission Control Areas (SECA) as of January 1, 2015. The main emphasis of this paper lies on the process of switch over from HFO to LSF.

Introduction

As of January 1, 2015, 0:00h, the sulphur content of fuel oil used on board ships within SECAs shall not exceed 0.10% m/m. This is required both by the European Directive n°2012/33/EU of 21st November 2012 as well as Annex VI of the international MARPOL Convention. In most cases, compliance will require the use of Low Sulphur Fuel, LSF (MDO or MGO) by the ship or of the recently offered compliant fuels such as HOMESO with higher pour points and viscosities that require heating. Prior to entry into a SECA, it is therefore required to have fully switched over from any high sulphur fuel in use to the SECA compliant marine fuel. Alternative compliance can be achieved by using fuels with higher sulphur content if exhaust gas cleaning systems are used, the so-called scrubbers.

Current SECAs are the designated areas within 200 nautical miles offshore the coastline of the USA and Canada, the US Caribbean ECA (waters around Puerto Rico and the U.S. Virgin Islands), as well as the Baltic Sea and North Sea/English Channel in Europe. This paper mainly concentrates on implications of the European SECAs:

Generally speaking, the western boundary of the North Sea SECA is the longitude extending from Brest (France) to Falmouth (U.K.) and further northwards from Strathy Point east of the Orkney Islands (U.K). The northern boundary of the North Sea SECA is the latitude extending from Vågsøy (Norway) to Thorshavn (Faroes). Further, the area is bound by the latitude extending from Skaw to Gothenborg (i.e. entry to the Baltic SECA).

Legal Background

With regard to sulphur oxide emissions the relevant regulation (MARPOL ANNEX VI, Regulation 14.4.3) states:

While ships are operating within an Emission Control Area, the sulphur content of fuel oil used on board ships shall not exceed […] 0.10% m/m on and after 1 January 2015.

The international MARPOL Regulations is transferred to European law by Directive 2012/33/EU regarding sulphur content of marine fuels. It regulates inter alia the sulphur content of fuels used by maritime transport in the Baltic Sea, North Sea and English Channel. It states in the relevant regulations:

- Member States shall take all necessary measures to ensure that marine fuels are not used […] within SOx Emission Control Areas if the sulphur content of those fuels by mass exceeds […] 0.10 % as from 1 January 2015.
  If a ship is found by a Member State not to be in compliance […] with this Directive, the competent authority of the Member State is entitled to require the ship to:
  - ☐ present a record of the actions taken to attempt to achieve compliance; and
  - ☐ provide evidence that it attempted to purchase marine fuel which complies with this Directive in accordance with its voyage plan […] and […] no such marine fuel was made available for purchase.
- The ship shall not be required to deviate from its intended voyage or to delay unduly the voyage in order to achieve compliance.

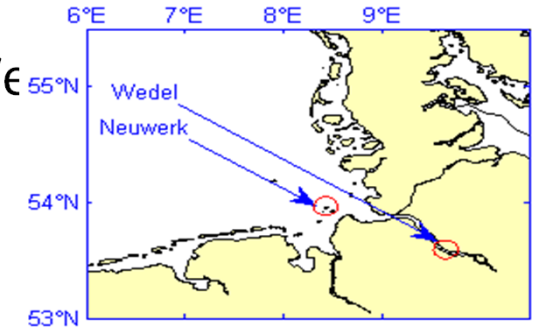
Properties and compatibilities of fuels

Energy content per Volume

Between High Sulphur Fuel Oil (HFO) and distillates lies a difference in density of approximately 8%. As the fuel pumps deliver a defined volume of fuel to the engine, this may result in a reduction of available energy for combustion and a potential reduction of maximum power that is not compensated by the higher net calorific value of distillates (+ + 2%). In normal operation of a vessel this will usually not be a problem, but might have a negative impact in extreme circumstances.

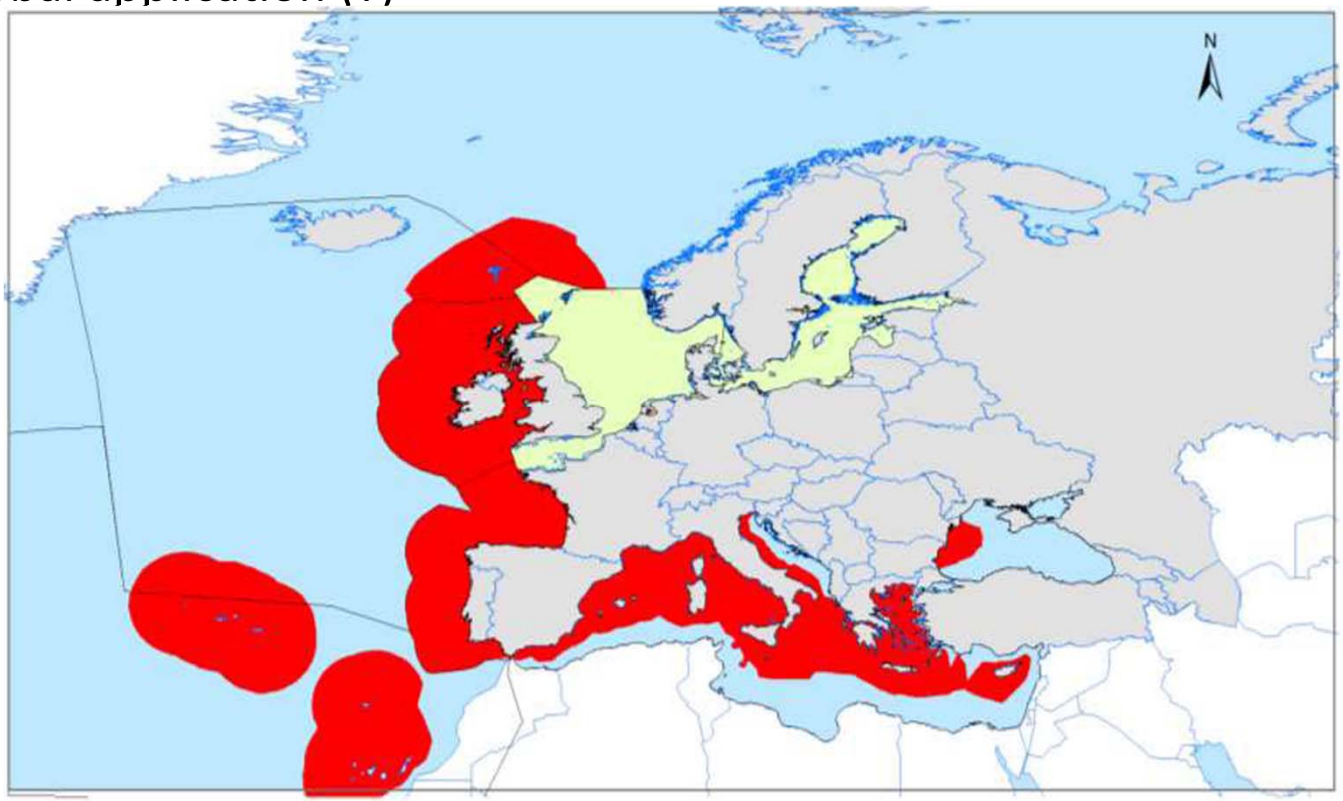
Compatibility

Reports further show that modifications in the refinery processes have led to considerable changes in fuel properties. In a report by Chevron (Chevron, July 2007) it is evidenced that the



Next regulatory step(s) 2020

- fuel availability and fuel price
- 0,5% in 2020
  - EU mandatory implementation
  - MARPOL global application (?)
  - washwater



Source: EU-COM: EU shipping week event 2015

Fuel availability

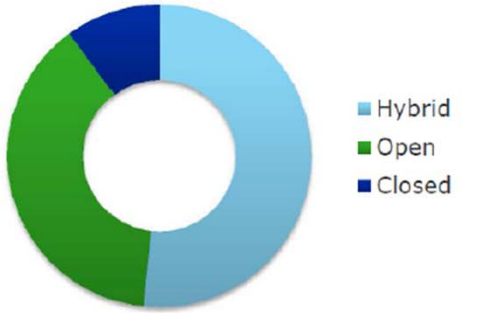
- MARPOL VI requires mandatory availability review 2018 latest
- Ship owners‘ Associations called for much earlier date
- MEPC 68 (May 2015) agreed on proceedings
  - Terms of reference, steering committee, tender
- State of play
  - 4 meetings of the StC
  - Fuel demand: EGCS important issue for evaluation
  - Fuel supply: production/ blending and impacts on non-marine sector
  - interim report by May 2016
  - Considerations of final draft report MEPC 70 (Oct 2016)

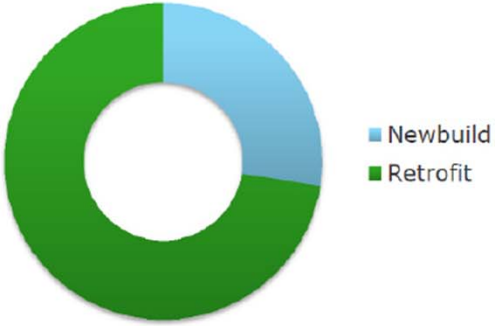
Fuel quality

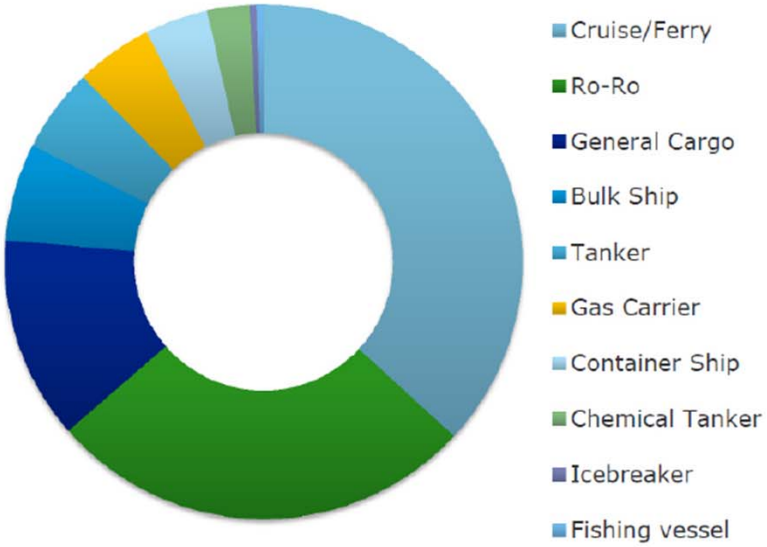
- MARPOL VI (Reg 14, 18) requires fuel supplied
  - to be no harmful to crews and ship safety
  - to be no harmful to environment
- Varying quality – ship operators called for controls of fuel suppliers
- MEPC correspondence group to review the regulary framework („states vs. markets“)
- MEPC 69 (April 2016) to discuss report
  - no ambition to stricten control levels
  - remaining issue particular towards 2020

Types

- Sea water scrubber – open loop system
- Fresh water scrubber – closed loop system
- Dry scrubbing technology

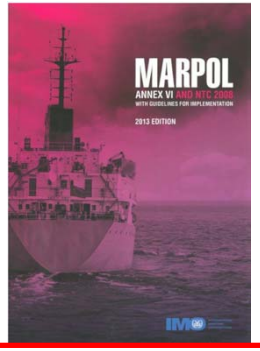






Source: DNVGL 2015

Wash water discharge in EU



IMO MARPOL VI/ MEPC.184(59)

EU Sulphur Directive (EU 2012/33)

yes

Washwater discharge in EU waters ?

Washwater Criteria:

- acidity (pH value)
- turbidity
- policyclic aromatic hydrocarbons
- nitrates

no

EU Marine Framework Directive

EU Water Framework Directive

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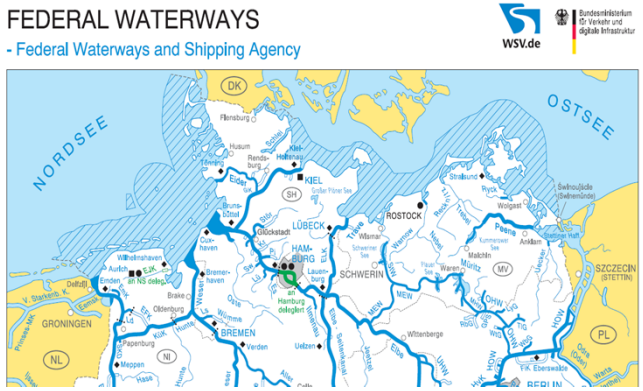

- EU harmonised wash water discharge rules
- Currently conflict WFD vs SRL remains
- Wash water sampling campaings
  - Necessary to have a sound data base
  - Decisive for subsequent policy recommendations
  - Remove operational and investment uncertainty
  - Initiatives by EGCSA, Cruise industry and GER
  - Scrubber sludge and PRFs/ understanding the management, handling, regulatory issues, cost implications (ESSF PRF)
- future stricter limit only to be applied to new installations

Further issues when operating EGCS

- Amendments to MARPOL VI BDN
- safe handling of chemicals (NaOH, others)
- Temporary operational non-compliance
  - malfunctioning of hardware,
  - …of measuring equipment,
  - non-compliance in specific operational circumstances
- Revision of EU Port Reception Facility Directive

Contents

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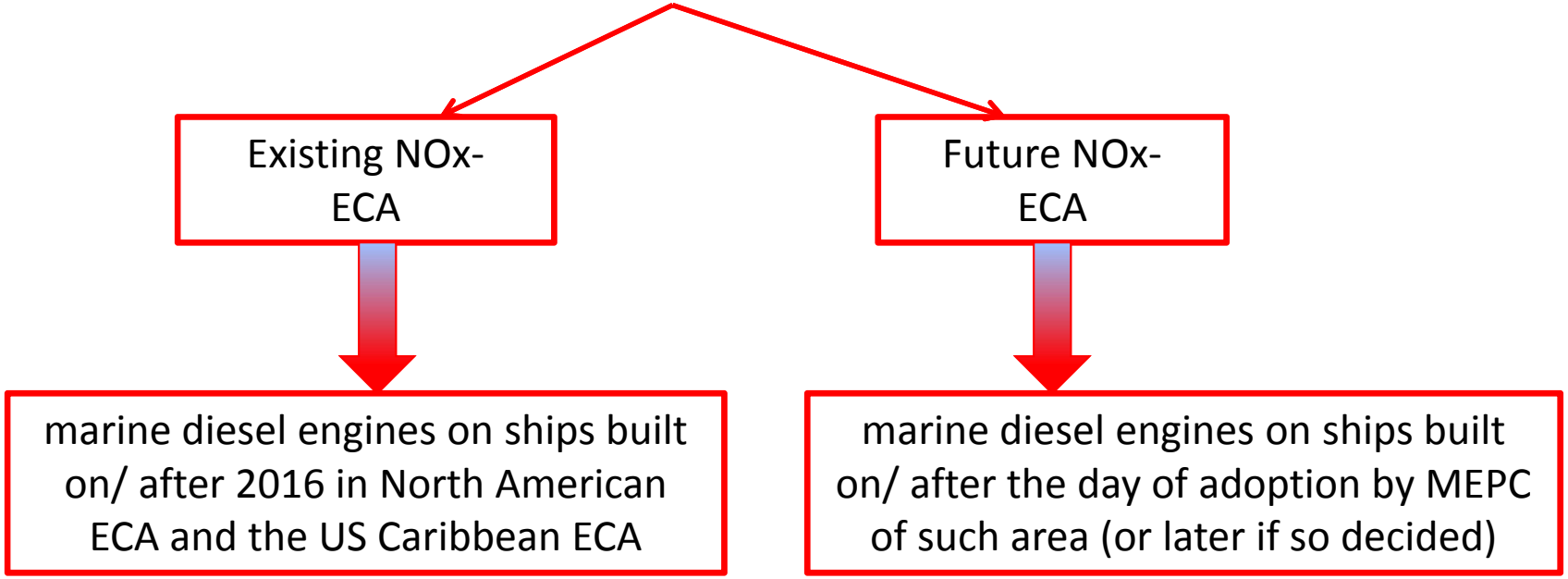
- Revised IMO MARPOL VI 2008, amended in 2014 for NOx ECA designation and Tier III
- Tier III NOx standard applies to



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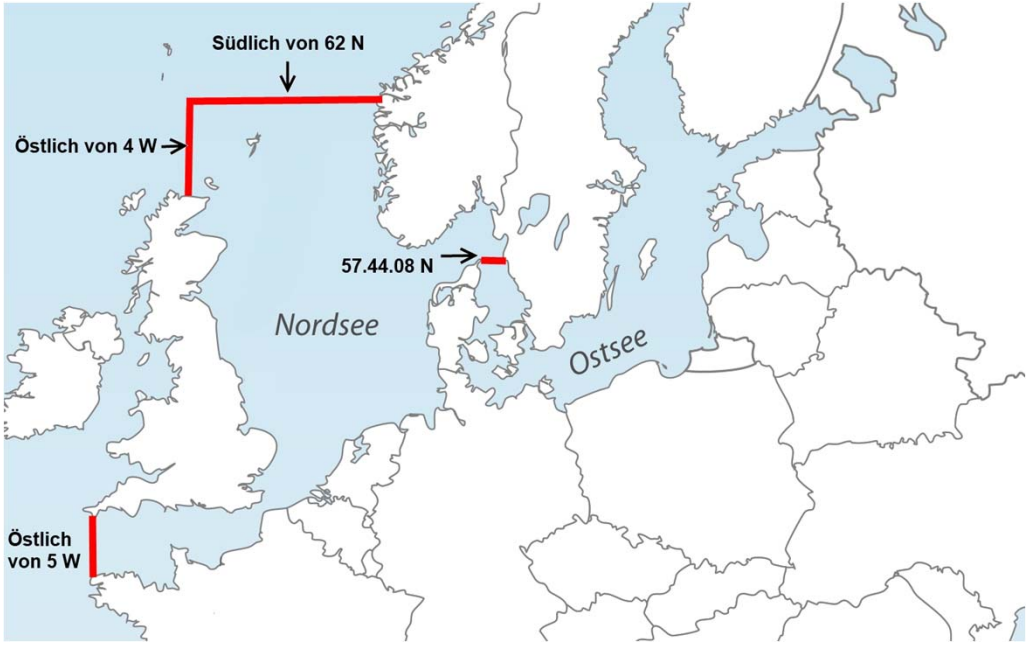
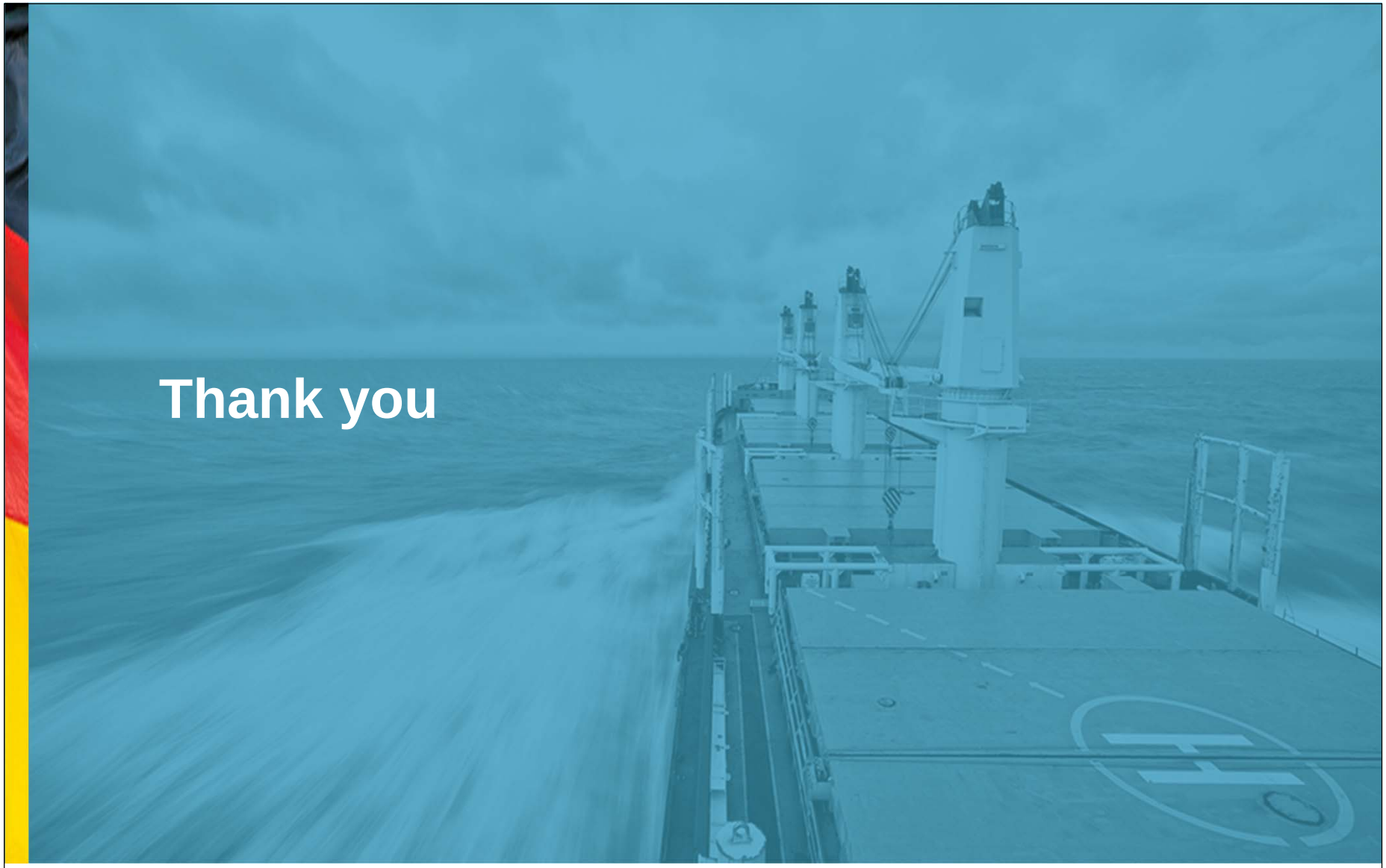
NOx ECA in Baltic and North Sea?



- political intention since 2010/11
- HELCOM and North Sea state group discussion
- recent HELCOM Maritime recommendations (incl. Russia) for designation of Baltic Sea NOx ECA as of 2021
- Coordination with North Sea states ongoing
- IMO submission envisaged for MEPC 70



Thank you

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