

NGO activities to get sea vessels clean.

A strategy to reduce
NO_x-emissions from shipping.

Annual Conference Coalition Clean Baltic
Pedase / Estonia, 8.-10. 5. 2009

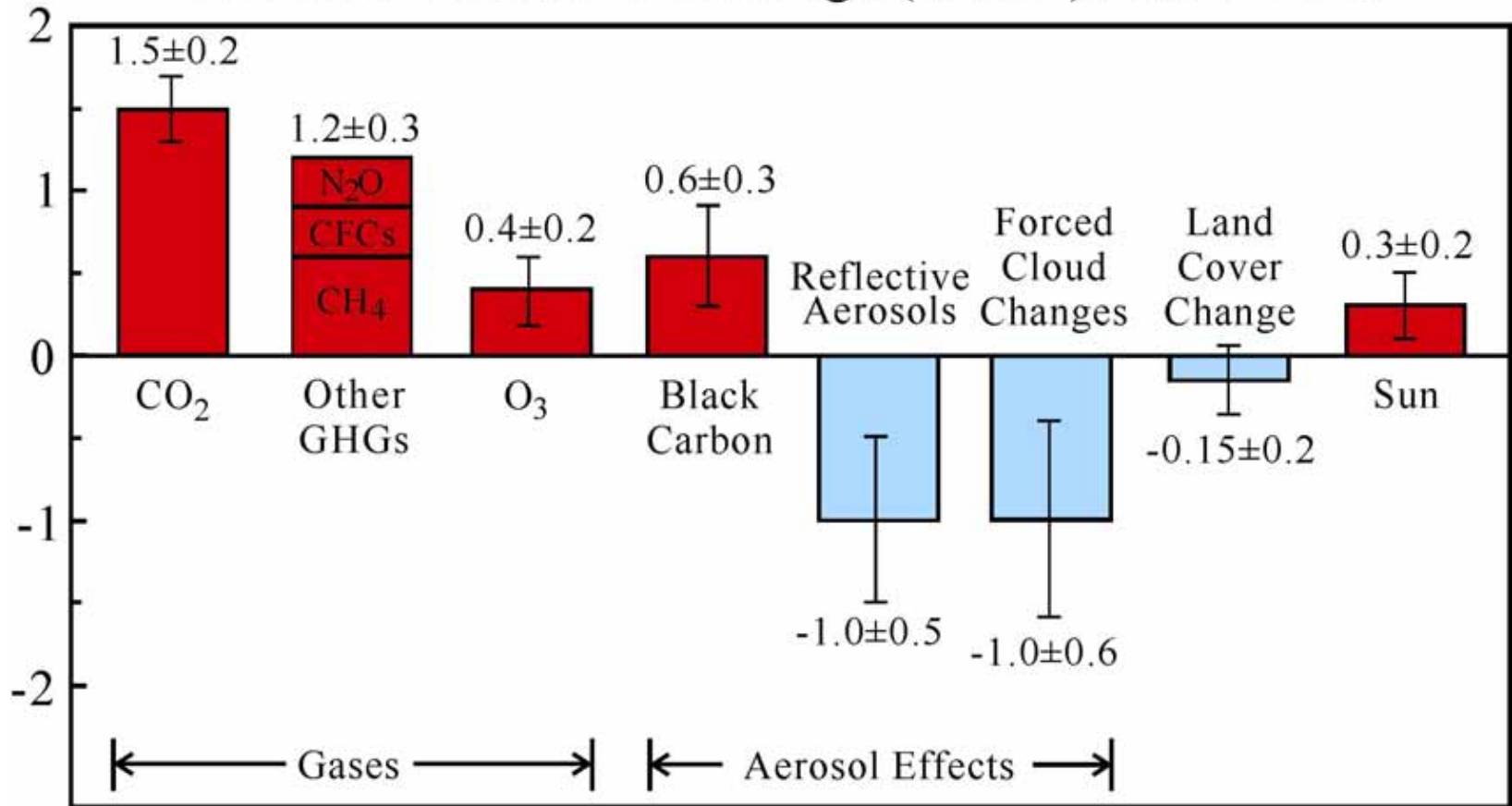
Werner Reh
Head of Transport

Overview

- **Interlinked Problems and impacts of pollutants**
 - Climate: CO₂, Soot/PM₁₀, NO_x (tropospheric Ozone)
 - Adverse health effects: Soot/PM₁₀, NO_x
 - Water quality: Acidification/eutrophication (CO₂, NO_x)
- **Solutions for reduction / IMO-decisions (Marpol Annex VI)**
 - Low sulphur fuels
 - NO_x-reduction
 - CO₂-reduction (plus reduction of overall emissions)
- **Necessary Activities of NGO to support reduction of emissions during the next months**

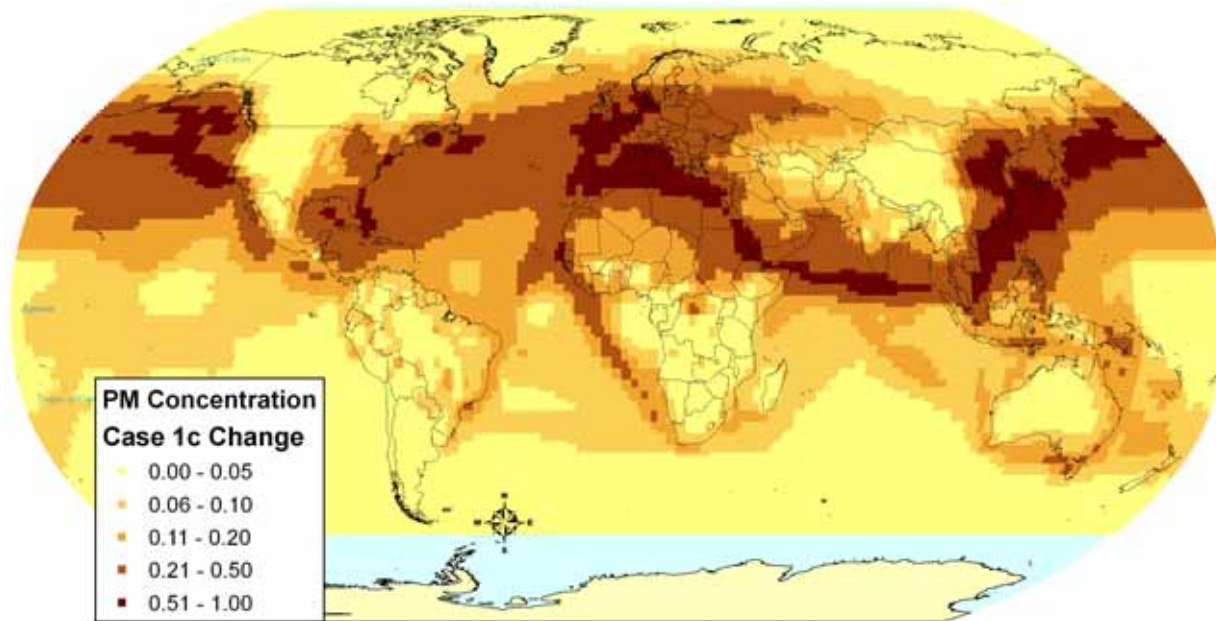
Climate protection: CO₂ plus soot (Black Carbon) plus NO_x (Ozone)

Effective Climate Forcings (W/m²): 1750-2000



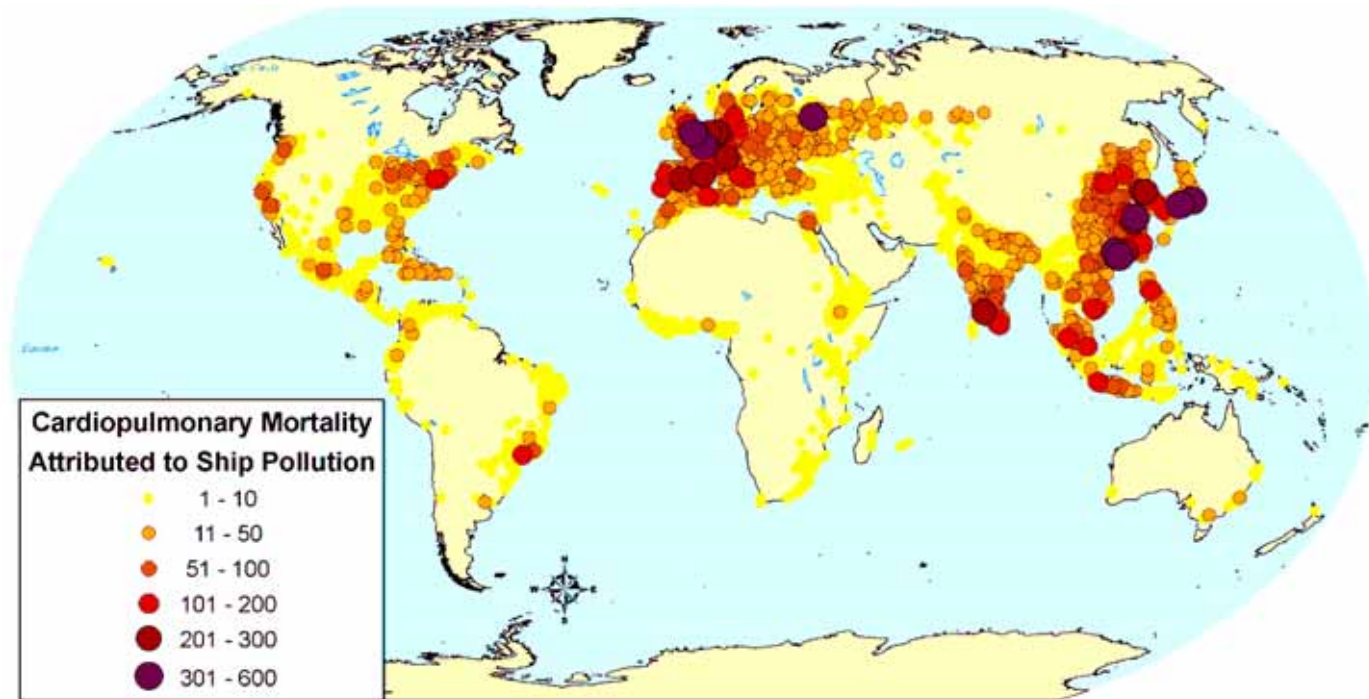
Climate forcing agents in the industrial era. “Effective” forcing accounts for “efficacy” of the forcing mechanism

Soot (Black Carbon) emissions from ships



Aus: Beate Lange, 2009

Adverse health effects: 60.000 premature death due to ship emissions



Aus: Beate Lange, 2009

Decline of water quality

■ Acidification

- Acidification in the upper layers of the oceans due to higher CO₂-content of the atmosphere (380 ppm instead of 280 ppm)
- → pH already decreased by 0,11
- pH-decline of 0.2 units considered to be critical for adaptation of marine organisms

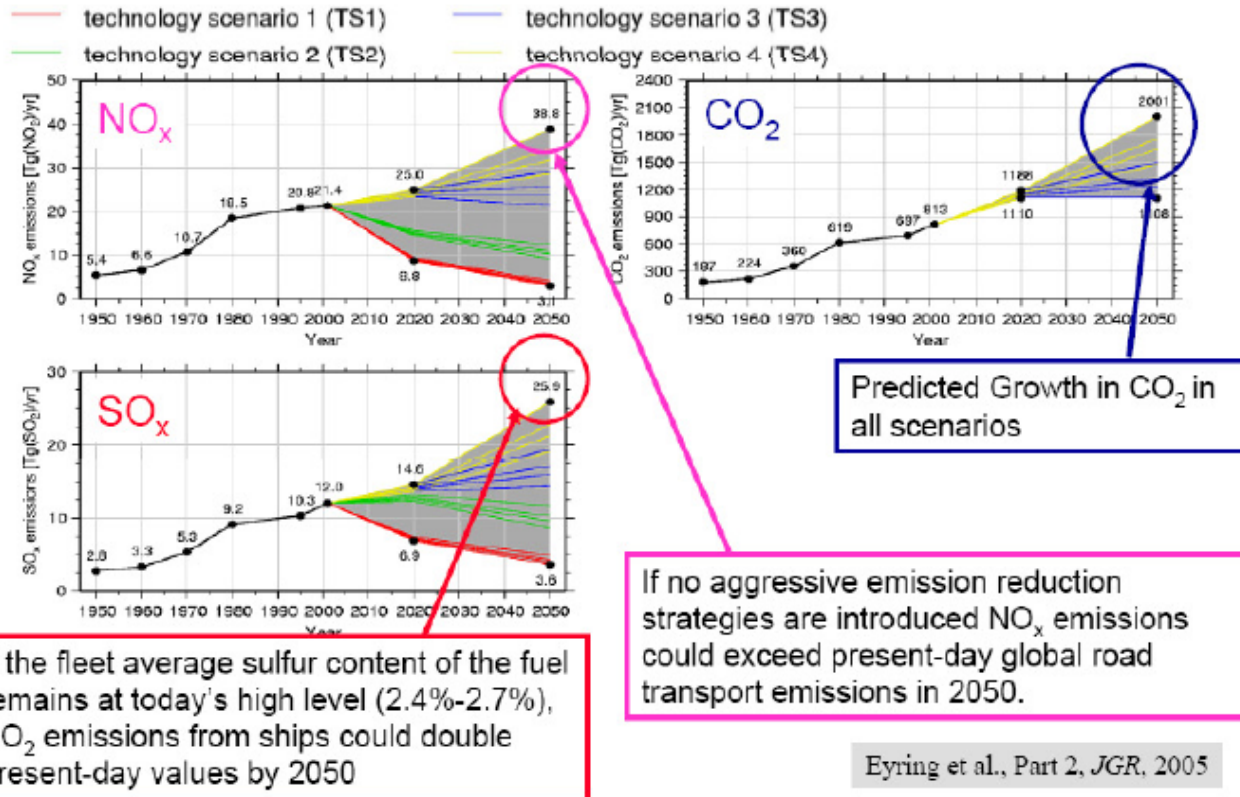
(decline of water quality)

- **Eutrophication: excess-supply of nutrients**
 - Toxic algal bloom, mass development of algae, increased oxygen depletion in deepwater in the summer
- **Atmospheric input is the biggest single source of nitrogen oxide (studies → North Sea)**
- **The atmospheric nitrogenic input results from industrial and traffic emissions from the costal areas and from intensive shipping**

Contribution of ship emissions

- Share of sea vessel emissions as part of global emissions
- CO₂: 2,7 % (international shipping).
- NO_x: 30 % (?)
(share airborne deposition Baltic Sea: 200.000 t contribution from shipping?)
- SO_x 9 %
- Soot (BC): no reliable figures
 - Shares: 92 % < PM_{2,5}
8% >PM_{2,5} - PM₁₀

Future development of ship emissions if nothing is done



Quelle: Eyring, Veronika; Past, Present-day and Future Ship Emissions; How to make the Sea green – Seminar, Brüssel 17.10.2007

■ Problems and impacts of ship emissions

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■ Solutions for reduction / IMO-decisions (Marpol Annex VI)

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■ Activities of NGO to support reduction of emissions during the next months

- IMO: structure and procedures
- Low-sulphur fuel oil
- Tier III (NO_x)
- ECAs (NECAs, PM-ECAs)

1. Low sulphur ship fuel oils (MARPOL Annex VI)

1. Decrease of the globally permissible sulphur limit values

- effective from January 2012 max. 3.5%
- effective from January 2020 max. 0.5%

2. Tightening of SECA regulation

- effective from July 2010 max. 1.0%
- effective from January 2015 max. 0.1%

Revision clause in 2018 (is enough low sulphur fuel offered by the market? Otherwise: 0,5%-target is postponed to 2025)

Advantages of cleaner fuel (marine diesel/distillates vs. residual oil)

- Soot/PM10 is reduced by almost the same proportion (about 70 per cent)
- Reducing NOx requires low sulphur fuels: SCR (Selective Catalytic Reduction) can be used to reduce soot and NOx as the best technique.

2. NO_x-Limit values for new engines

Tier I: applies to all engines constructed between 1 January 2000 and

1 January 2011

17 g/kWh for $n < 130$ rpm

$45 \cdot n^{-0,2}$ g/kWh with n : 130 to 2000 rpm

9.8 g/kWh for $n < 2000$ rpm

Tier II: applies to all engines constructed on or after 1 January 2011

14.4 g/kWh for $n < 130$ rpm

$44 \cdot n^{-0.23}$ g/kWh with n : 130 to 2000 rpm

7.7 g/kWh for $n < 2000$ rpm

Tier III: applies to all engines constructed on or after 1 January 2016,

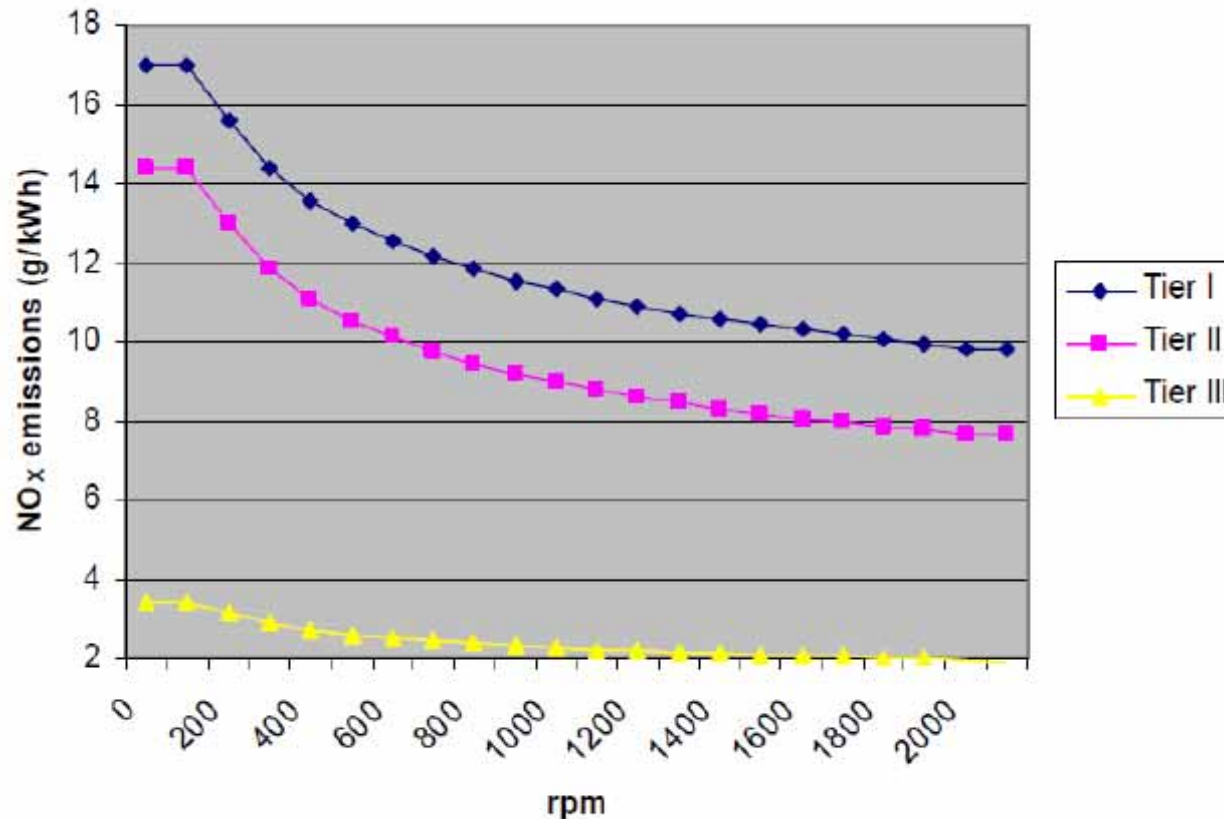
and/or ships operating in **Emission Control Areas (ECAs)**

3.4 g/kWh for $n < 130$ rpm

$9 \cdot n^{-0,2}$ g/kWh with n : 130 to 2000 rpm

2.0 g/kWh for $n < 2000$ rpm

Only Tier III (2016 ff.) is ambitious and demands effective exhaust cleaning



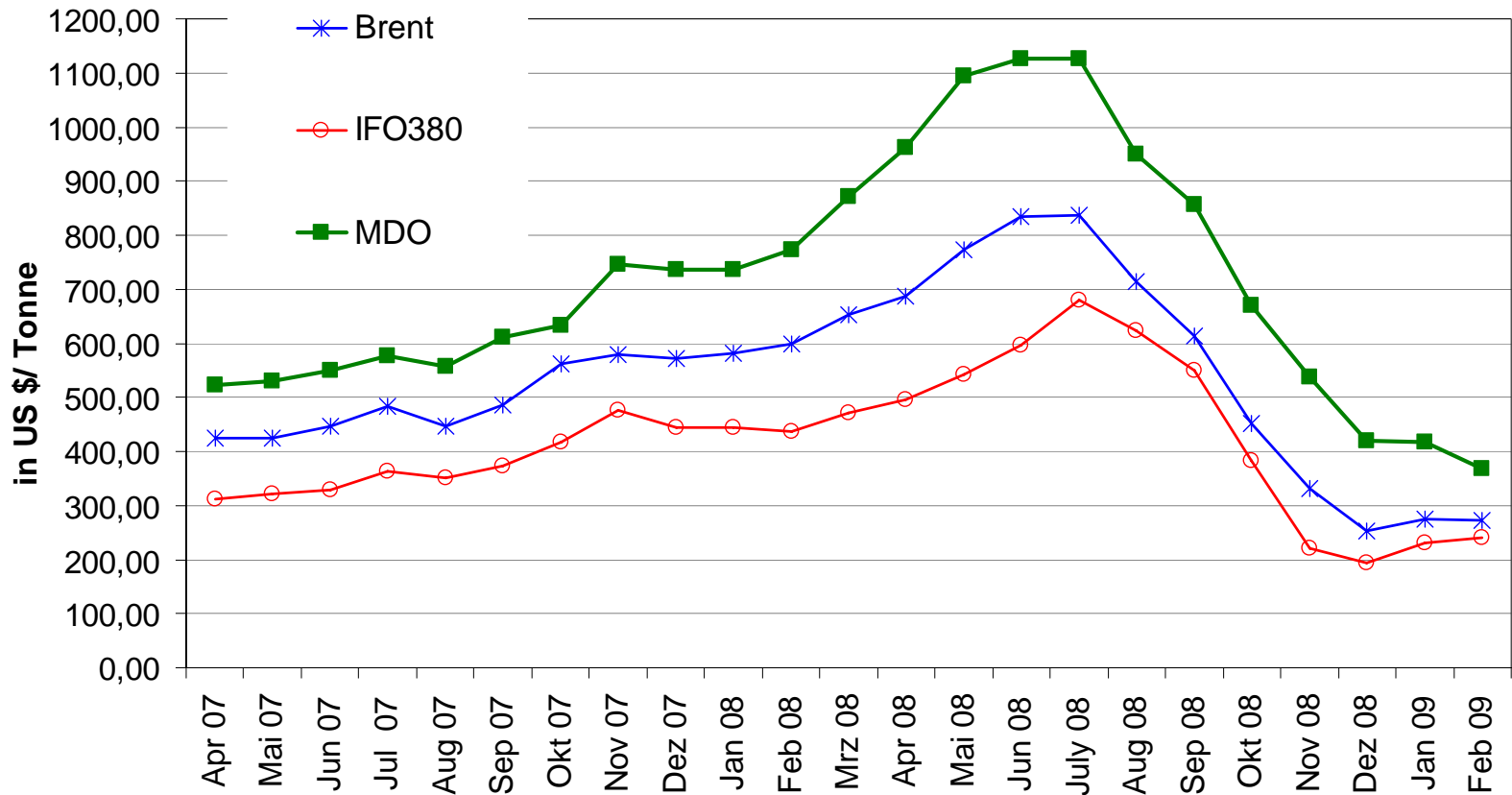
3. CO₂-Reduction (+ other pollutants): Huge efficiency potential small/no costs

- Improved propulsors 5 – 10 %
- Optimised engines 2 – 12 %
- Use of Distillates (marine Diesel) 2 – 6 %
- Skysails 20 - 40 %

Reduction of operating speed:

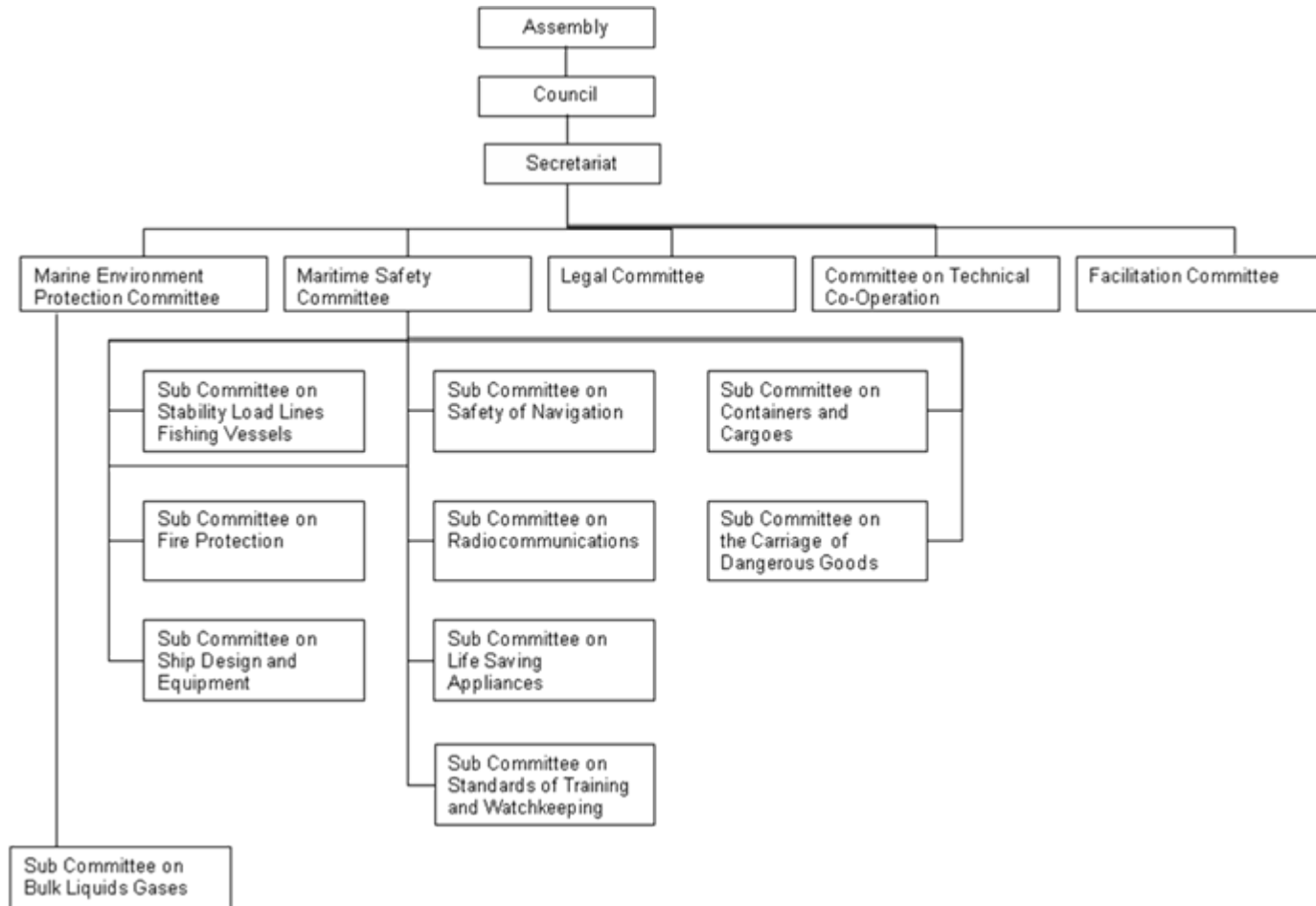
- Per 1 % slower: saves about 2 % CO₂
- Decrease of 15% saves 25-35%

How to reach this CO2-reduction? Prices of residual oil (IFO380) and marine diesel



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Structure of IMO



But: tacit acceptance procedure to improve existing regulations

IMO-Review of MARPOL Annex VI

- **Adoption of new conventions or technical codes is extremely complicated, takes very long such as MARPOL Annex VI**
- **But amendments to an already ratified annex: „tacit acceptance procedure“:**
 - 6 month publication
 - Adoption: 6 month for „notice of opposition“
 - 12 month phase of implementation begins
- **Annex VI: publ. phase 3/2008 (57th MEPC); adoption 57th MEPC (10/2008); ended April 2009**

What should NGOs / CCB do?

- **Combine climate change, health effect and water quality as arguments for NO_x-reduction**
- **Prevent revision of low-sulphur target 2020**
- **Demand coastal states for Introduction of ECAs for Nitrogen Oxide in Baltic Sea incl. ports**
 - Every IMO-member state can do that
 - Coordinated proposal for several member states
- **Demand ECA Baltic Sea for PM₁₀**
- **IMO decisions 3/2008 and 10/2008 provide window of opportunity for environmental NGOs**

**Thank you for your
attention !**

Further infos: www.bund.net

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