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Air Emissions from Ships: The Changing Landscape

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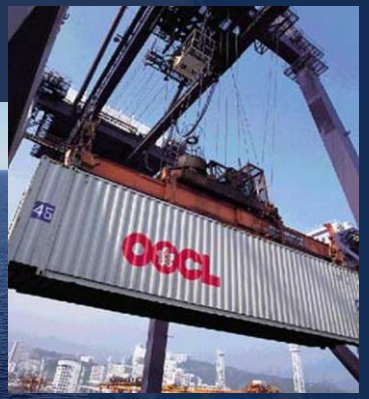
World Shipping Council

Mobile Source Tech Review SubCommittee
4 May 2009

World Shipping Council

- Represent global liner industry
- Carry 90 - 95% of the world's containers
- 29 Member Companies
  - Container ships
  - Transoceanic Vehicle Carriers



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Overview

- Annex VI and the Evolution of Marine Standards
- Key Questions & Challenges:
  - Fuel Availability
  - Scrubbers ?
- Climate – Where is the Debate going in the IMO?
- Prospects for the Future

New International Standards

New Standards will result in large reductions

New engines
- Tier 2: 20% reduction from Tier 1 in 2012
- Tier 3: 80% reduction from Tier 1 in 2016
  - Geographic standard – applies in Emission Control Areas (ECAs)

Fuel Sulfur Limits (to address SOx and PM)
- March 2010: 10,000 ppm in ECAs
- 2012: Global cap falls to 35,000 ppm
- 2015: ECA cap falls to 1,000 ppm
- 2020: Global cap falls to 5,000 ppm - subject to a review in 2018

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Effects of the New Annex VI Standards

- **Costs will be significant, but uniform across competitors.**
- **New engine technologies will emerge to meet the Tier III NOx standards.**
  - **Some will drive a departure from the usual trade-off between NOx and CO2.**
- **Requirements to burn cleaner 1000 PPM fuel in 2015 represent a significant change in demand in the international oil market.**

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What Engine Technologies Will emerge to meet Tier III?

- **SCR-based Systems**
  - Allows dramatic Improvement in NOx emissions w/o traditional trade-off in fuel economy
  - Requires urea and presents challenges for some other technology applications

- **Advanced EGR with HAM**
  - Test bed efforts underway to reach Tier III levels

The Global Fuels Market

- Demand for lighter fuels is increasing …
- Uncertainty in supply will be a reality
- Challenges to the 1000 ppm standard likely to emerge
- Scrubbers – Are they a viable option?

Exhaust Gas Cleaning

- Seawater scrubbers
- Freshwater systems
- Other …

The New Annex VI Standards

What Do the Standards Mean for the future regulatory debate at the IMO?

- The negotiating dynamic at the IMO has shifted

- Key industry groups see strong standards in their best interest

- Climate regulation is now the top priority for action at the IMO

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CO2 Generation in the Global Supply Chain

- Marine transportation accounts for some 2- 3.5% of total anthropogenic CO2 emissions worldwide.

- Generation of CO2 in the transoceanic leg is tremendously low when compared to all other transportation options

- What does this suggest about future trends in a changing economy?
  - movement of production?
  - vessel speed?
  - changes in design?

The GHG Debate at the IMO

- Development of a legally-binding treaty is under debate
- Scope of application is highly contentious
- Most parties want universal application
- What system is to be employed?
  - Fuel tax
  - Mandatory efficiency standards
  - Trading scheme
  - A hybrid of above approaches

IMO

UNFCCC

Basic Elements of the WSC Proposal

- Efficiency Standards
  for both new & existing ships

- Standards for New Builds
  - New builds built after date X meet specific efficiency standard. Segregate new builds from existing ships.
- Standards for Existing Ships
  - Existing ships of a particular class & size meet a given standard in 20XX. More limited number of tiers.
- Tiered Standards
  - Standards to become more stringent over time

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How Does the Approach Work?

- **Only existing vessels that fail to meet standard would be subject to fuel charges**
- **Charges tied to fuel consumption**
  - **Existing ships failing to meet standard pay charge per tonne of fuel consumed.**
  - **The total charge is commensurate with how much a given vessel is operated, and**
  - **The amount assessed per tonne of fuel would be adjusted relative to how much the vessel falls short of the applicable standard**

Calculating charges applicable to a Vessel

- For illustration purposes, assume that the standard applicable to a particular ship class and size is *16 grams per ton mile* and that a given ship is 25% less efficient than the standard, and the vessel consumes 50,000 tonnes of fuel.

- The applicable fee would be calculated as follows:

  1 - 20 grams per ton mile ÷ 16 grams per ton mile x $50 x 50,000 = ***$625,000***

- For a vessel 50% less efficient:

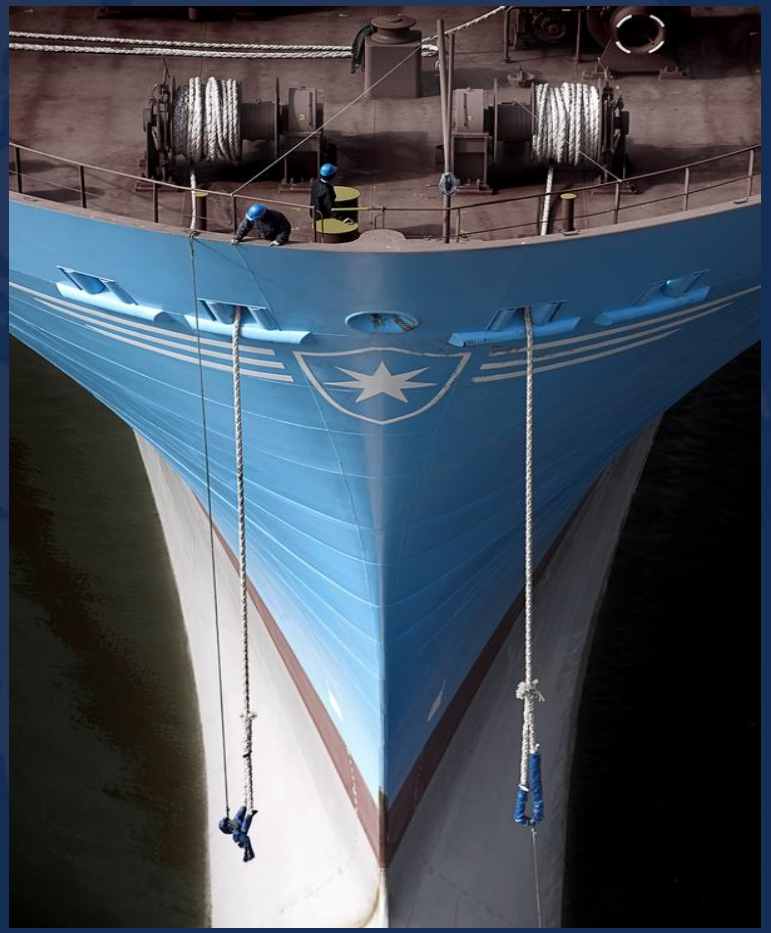
  1 - 24 grams per ton mile ÷ 16 grams per ton mile x $50 x 50,000 = ***$1,250,000***

Where Can We Expect the IMO Debate on GHG to Go?

- Development of mandatory efficiency standards for new builds is highly likely.
- Industry is fully supportive of a global, legally-binding treaty.
- Scope of application and what type of system or treaty architecture is most appropriate will remain contentious.
- At the WSC, we believe an efficiency-based scheme drawing on elements tabled by the U.S., Denmark, the WSC, and Japan will produce the most effective regime.

Why We Should Be Optimistic About Future Progress

- We have seen a major shift in the nature of the maritime environmental debate
  - support for stringent international standards
  - greater awareness in the regulatory community
- Global standards that are also responsive to the needs of specific geographical conditions have become widely supported.



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Questions

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