Active Shipbuilding Experts' Federation
12th ASEF Forum

23 October 2018
Dalian, China

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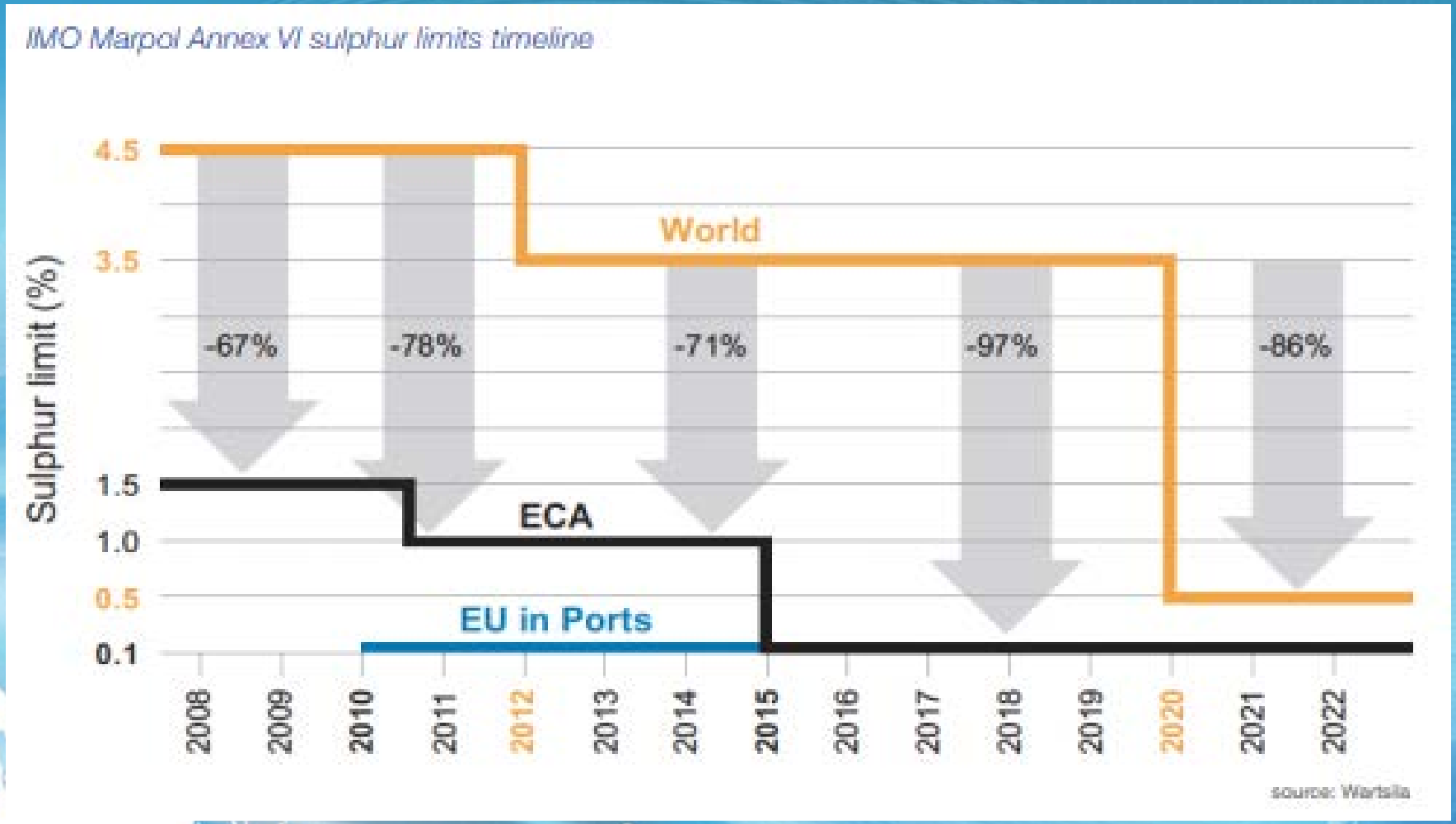
Secretary General
Asian Shipowners' Association

ASA Update

- 2020 Sulphur Cap
- Contaminated Fuel

Timelines



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Preparing for the 2020 Sulphur Cap

Options	Concerns
• New Fuel Blends • Scrubbers • LNG • Methanol	• Fuel Availability • Fuel Compatibility • Fuel Quality • Fuel Price • Enforcement • Market Impacts

New Fuel Blends

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New Fuel Blends

There will be a global interplay between the following considerations:

- **Fuel Availability**
- **Fuel Compatibility**
- **Fuel Quality**
- **Fuel Price**

New Fuel Blends

- Will low-sulphur compliant fuel be available in the vessel's trading area and at what cost?
- Bunkering ports within the trading area may not have enough compliant fuel in their storage tanks and supporting infrastructure.
- Compliant fuel would definitely be at a higher price but by how much and in what quantity.
- Shipowners will have to absorb higher cost or pass it on to end users.

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New Fuel Blends

Estimated Compliant Fuel Supplies

- Global utilization of 300 MMT per annum
- At present, shipping is consuming around 3.2m barrels per day (bpd) of HSFO and 700,000 - 800,000 bpd of LSFO
- From 2020, this proportion will change to 700,000 bpd of HSFO and 3.4m bpd of LSFO

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New Fuel Blends

- What happens when compliant fuel is not available?
- A proposal is FONAR – Fuel Oil Non-Availability Report.
- How will this be regulated and implemented considering differences in interpretation by different Port State Controls?
- Need to ensure consistent global implementation.

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New Fuel Blends

- Will the compliant fuel be compatible with the vessel's previously bunkered fuel?
- Does the vessel need to have separate storage for the different compliant fuel?
- Will the compliant low sulphur fuel be safe to use in terms of performance characteristics?

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New Fuel Blends

Fuel Quality Issues

- Low Sulphur Distillates (LSD)
- Blend of LSD and High Sulphur Residual Fuel Oil (HSFO)
- Low Sulphur Residual Fuel Oil (LSFO)

- Different Flashpoint and Stability
- Compatibility Issues
- Possible Engine Problems
- Loss of Power

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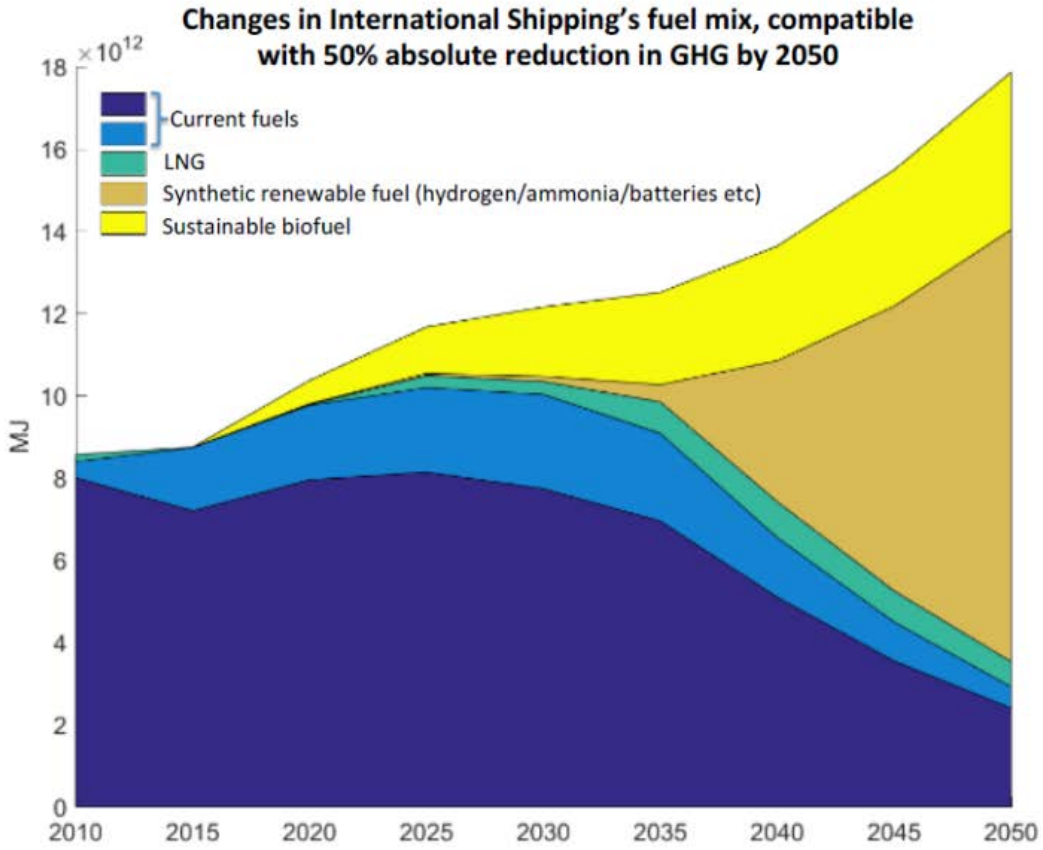
New Fuel Types



Smith, T., Raucci, C., Haji Hosseinloo S., Rojon I., Calleya J., De La Fuente. S., Wu P., Palmer K. CO2 emissions from international shipping. Possible reduction targets and their associated pathways. Prepared by UMAS, October 2016, London.

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Transitional Problems

- Huge logistics involving transport between refineries
- Storage and delivery vessels
- Massive work for ships to clean out fuel systems to avoid sulphur contamination
- Bunkering ports will need to reassign storage tanks and other infrastructure to the different fuel types

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Transitional Timelines

Scrubbers

Mfame

Scrubbers

Considerations for Scrubbers

- Recent technological improvements in scrubber technology – more efficient, compact, reliable and cost effective.

- Improvements and efficiency in scrubber retrofitting by vendors and shipyards.

- Swing towards scrubbers due to unavailability of skilled crew to operate modern equipment and the unequal distribution of compliant fuels.

Scrubbers

Considerations for Scrubbers

- Inherent risks of dealing with compliant fuel availability, compatibility, quality and cost.

- Question of whether the owner or charterer will bear the fuel cost especially where there is large price difference and volatility (approx $230/mt).

- To date 983 ships have been retrofitted with scrubbers as of 31 May 2018 with prediction that the uptake will gain momentum as 2020 looms.

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Scrubbers

- Operational Risks
  - ✓ Crews may have to deal with different fuel types.
  - ✓ Demonstration of Compliance to PSC demanding.

- Availability Risks
  - ✓ Relying on a HFO supply chain which may be slowly but surely phased out depending on supply and demand.

- Financial Risks
  - ✓ High cost of equipment and retrofitting.

Scrubbers

- <u>Compliance Risks</u>
  - ✓ Increasing crew health concerns from dealing high sulphur content fuels.

- Preference for Open Loop scrubbers over the Closed Loop and Hybrid ones.

- Nearly 60% of all retrofits and new building installations are in Asia and increases to nearly 85% of new builds.

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Other Options

- <u>Other Fuels</u>
  - ✓ Liquid Natural Gas (LNG): Strong potential but yet to have full scale facilities in many bunkering ports.
  - ✓ Methanol
  - ✓ Hydrogen
- Fuel Cells/Hybrids
- Renewal Energy : Wind Power

Shipowners' Perspectives

- <u>Structural/Technical Compatibility</u>
  - ✓ Vessel's structural design may not be compatible for installation due to space constraint.
  - ✓ Shipowners choosing compliant fuel may not be compatible with the engine.

- <u>Vessel's lifespan</u>
  - ✓ Age of vessel and obsolescence.
  - ✓ Cost of retrofitting vs capital recovery.

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Shipowners' Perspectives

- Vessel Types and Trade involved
  - ✓ Vessel types
  - ✓ Liner vs Tramping
  - ✓ Trading Areas: Regional vs Deep Sea

- Market Conditions
  - ✓ Economic outlook
  - ✓ Financial resilience
  - ✓ Flag State policy and incentives

- Compliant Fuel Availability and Cost

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MEPC 73 Oct 2018

- Safety consideration surrounding fuel management under the 0.50% sulphur limit.
- Confusion on whether existing ISO8217 marine fuel quality standard will cover fuel blends produced to meet the 0.50% sulphur limit.

MEPC 74 May 2019

- More comprehensive guidelines for both distillate and fuel oil blends containing residual fuel will be developed at PPR in Feb 2018 for approval at MEPC 74.
- Industry guidance to address impact of new fuel blends or fuel types on machinery systems concerning use, handling and storage.

Contaminated Fuel

- Contamination of marine fuels has recently surfaced in the US, the Gulf and Far East including Singapore.
- In addition to clogging filters and separators, engines have also been damaged resulting in ship delays and, in some cases, has jeopardised the navigational safety of the ship.
- Commercially, it has led to an increase in bunker claims and disputes.

Contaminated Fuel

- Contaminated fuel is hard to detect as it complies with accepted industry standard in all respects - ISO 8217 : 2015 specifications.
- ISO 8217 provides a guide for fuel quality but does not address the new types of contaminants found recently, which require additional specialist tests that are not included in ISO 8217.

Thank You