

Bunkers



KIVI 30 oct 2012

Anton Spierings (VNPI)

Bunkers

- Chemical waste issues
- ISO 8217 development
- MARPOL Annex VI impact

Lifethreatening ?



NOS Nieuws - KLPD wil eisen aan stookolie.flv

www.nos.nl/video/354608-klpd-zet-jacht-in-op-vervuilde-stookolie.html

From the press

Chemical waste found in Dutch bunker fuel (Lloyd's 23 March 2012)

“CRIMINALS are illegally disposing of chemical waste in bunker fuel used in the port of Rotterdam, according to Dutch police. Tests on fuel carried from Rotterdam to Antwerp on inland bunker tankers this week found that nearly a third contained waste products not naturally present in bunker fuel.”

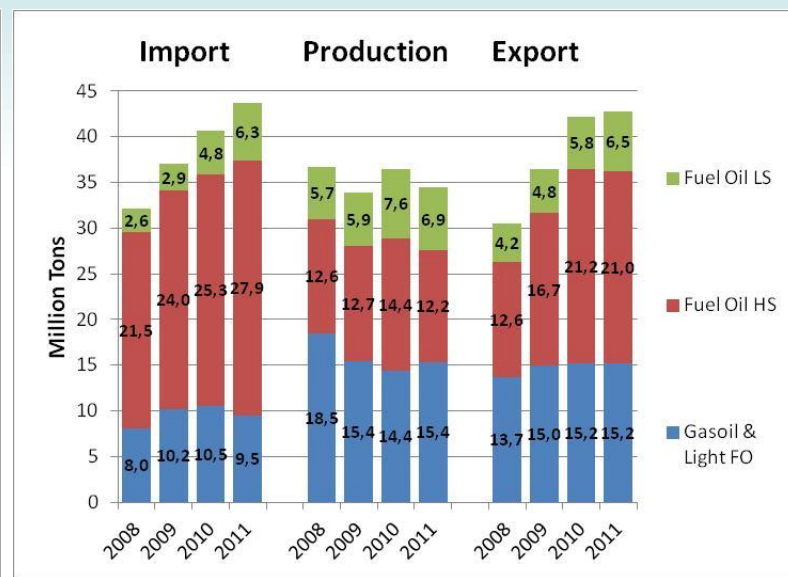
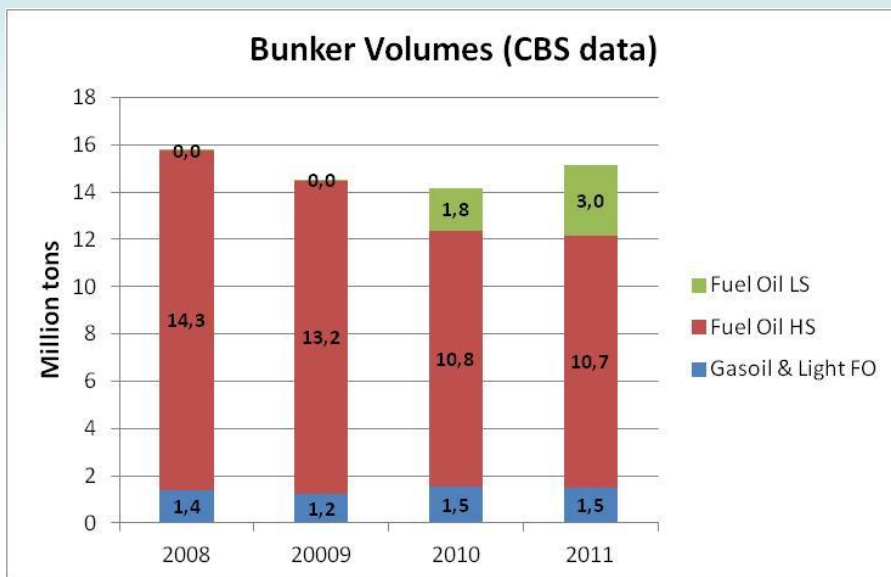
Zembla 28.03.2012:

“De KLPD wil dat er striktere wettelijke eisen komen voor stookolie. De opsporingsdienst schat dat nu bijna alle stookolie voor schepen is aangelengd met chemicaliën. “

Problem definition

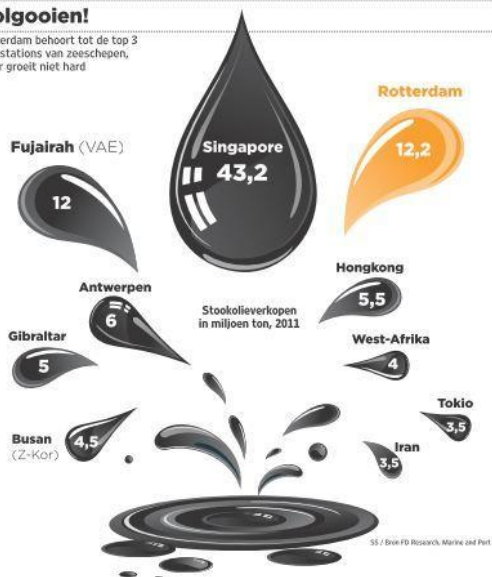
- Police suspect disposal of waste streams into bunker fuels
- Inspections have resulted in only a few cases for further investigation/prosecution
- Lack of definitions and analysis tools makes detection difficult
- Extent of problem is unknown
- Claims of large scale waste disposal have not been proven but have damaged the Rotterdam bunker business

Bunker Market



Volgoeien!

Rotterdam behoort tot de top 3 tankstations van zeeschepen, maar groeit niet hard



Rotterdam bunker market turnover circa \$ 7 billion.

2nd largest worldwide

2012 year to date volume down 12%

Employment related to bunker market ~ 1500 people (15 suppliers, 11 terminals, 13 barge operators, inspectors, other services)

Incentive to protect/improve reputation

Current Activities (3/4 Q 2012)

- Multistakeholder effort to develop:
 - Practical definitions
 - List of suitable fuel oil blend components
 - List of waste oils that are not suitable for fuel oil
 - Limit values for substances in petroleum derived fuel oil components
 - List of “indicator substances” that may justify police investigation if present

Note: this is not intended as basis for legislation on top of international/EU regulations

- Participants
 - (Semi)government: Ministry (I&M), Police (KLPD), Institute for Health & Env. (RIVM), Agentschap NL, Rotterdam Harbour
 - Industry: VNPI (majors), NOVE (independents), VOTOB (storage), Inspectors, KVNR (shipping)

Waste or Byproduct

EU Directive 2008/98/EC on waste

Article 3 Definitions

1. ‘ **waste** ’ means any substance or object which the holder discards or intends or is required to discard;

Article 5 **By-products**

1. A substance or object, resulting from a production process, the primary aim of which is not the production of that item, may be regarded as not being waste referred to in point (1) of Art. 3 but as being a by-product only if the following conditions are met:

- (a) further use of the substance or object is certain;
- (b) the substance or object can be used directly without any further processing other than normal industrial practice;
- (c) the substance or object is produced as an integral part of a production process; and
- (d) further use is lawful, i.e. the substance or object fulfils all relevant product, environmental and health protection requirements etc.

Regulated substances

In components and finished fuels

- PCB's (max 0.5 mg/kg per type, 2.0 total)
- Organic chlorine, fluor, bromine, iodine (max 50 mg/kg)

In finished fuels used on board

- Sulphur (MARPOL)



ISO 8217

The international quality standard for marine fuels

- Voluntary use
- Distillate fuels (4 grades)
- Residual fuels (11 grades)

Chronology

- 1987 1st edition
- 1996 2nd edition
- 2005 3rd edition
- 2010 4th edition
- 2012 5th edition (analytical details only)

ISO 8217 development

Requirements for Marine Residual Fuel , Grade RMG

		1987	1996	2005	2010
Density kg/m ³	max	991			
Viscosity cS @50°C	max	380			
Pour point °C	max	30			
Flash point °C	min	60			
Carbon residue %	max	18			
Ash %	max	0,15		0,1	
Water %	max	1,0		0,5	
Sulphur (outside SECA)%	max	5,0		4,5	Marpol
Vanadium mg/kg	max	300			350
Sediment potential %	max	0,1			
Catalyst fines (Al + Si) mg/kg	max	80			60
Used Lube Oil (Zn P Ca) mg/kg	max	15/15/30			
Ignition Quality CCAI		870			
Acid Number mgKOH/g	max	2,5			
H ₂ S mg/kg	max	2			
Composition		See general requirements			

ISO 8217 General requirements

ISO 8217:2005

The fuels shall be a homogeneous blends of hydrocarbons derived from petroleum refining. This shall not preclude the incorporation of small amounts of additives intended to improve some aspects of performance.

The fuels shall be free from inorganic acids and from used lubricating oils.

The fuel should not include any added substance or chemical waste which

- a) jeopardizes the safety of ships or adversely affects the performance of the machinery; or
- b) is harmful to personnel; or
- c) contributes overall to additional air pollution.

ISO 8217:2010

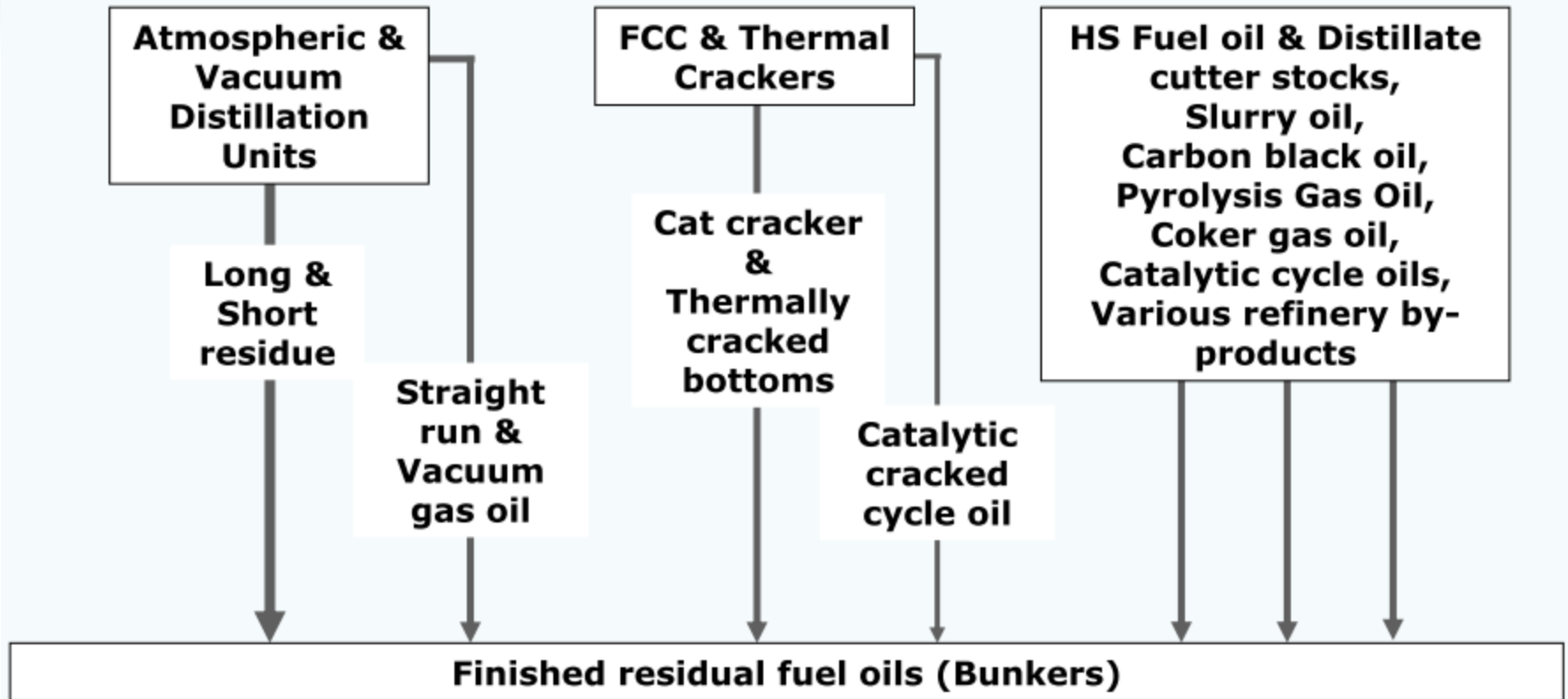
The fuel shall be a homogeneous blend of hydrocarbons derived from petroleum refining. This shall not preclude the incorporation of additives.

Added:

Fuels shall be free from any material that renders the fuel unacceptable for use in marine applications.

The fuel shall be free from bio-derived materials other than 'de minimis' levels of FAME .

Bunker production



ISO 8217

Use by traders

- ISO 8217:2010 default standard for bunker contracts in Singapore since July 2012
- Majority of bunker contracts still use ISO 8217:2005
- Reported premium for ISO 8217:2010 compliant fuel circa \$2 - \$20 per metric tonne vs. 8217:2005
- Buyers and sellers can agree to omit certain bunker specifications

ISO 8217 Next revision

Issues that will be debated for the next revision

- Ignition and combustion properties
- Possibility of including bio-diesel in marine fuels
- Studying contamination cases and developing standard test methodology to deal with a disturbing trend of an ever increasing number of possible low sulphur cutter stocks available on the market.

Reported contamination cases

Contaminants reported last 10 years

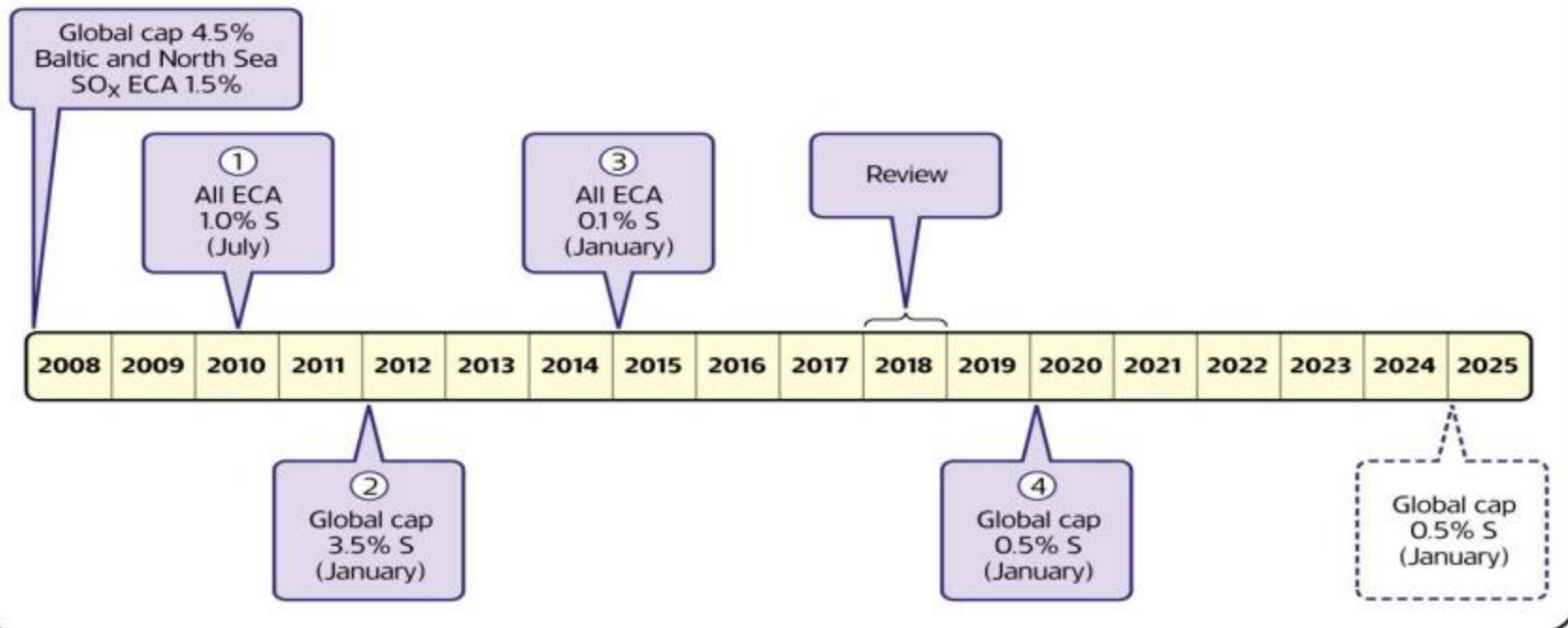
- Styrene, DCPD & Indene
- Chlorinated solvents
- Polypropylene, polyethylene
- Styrene
- Organic acids and esters
- Terpines
- Vegetable oil
- Used lube oil
- Various waste oils

MARPOL Annex VI



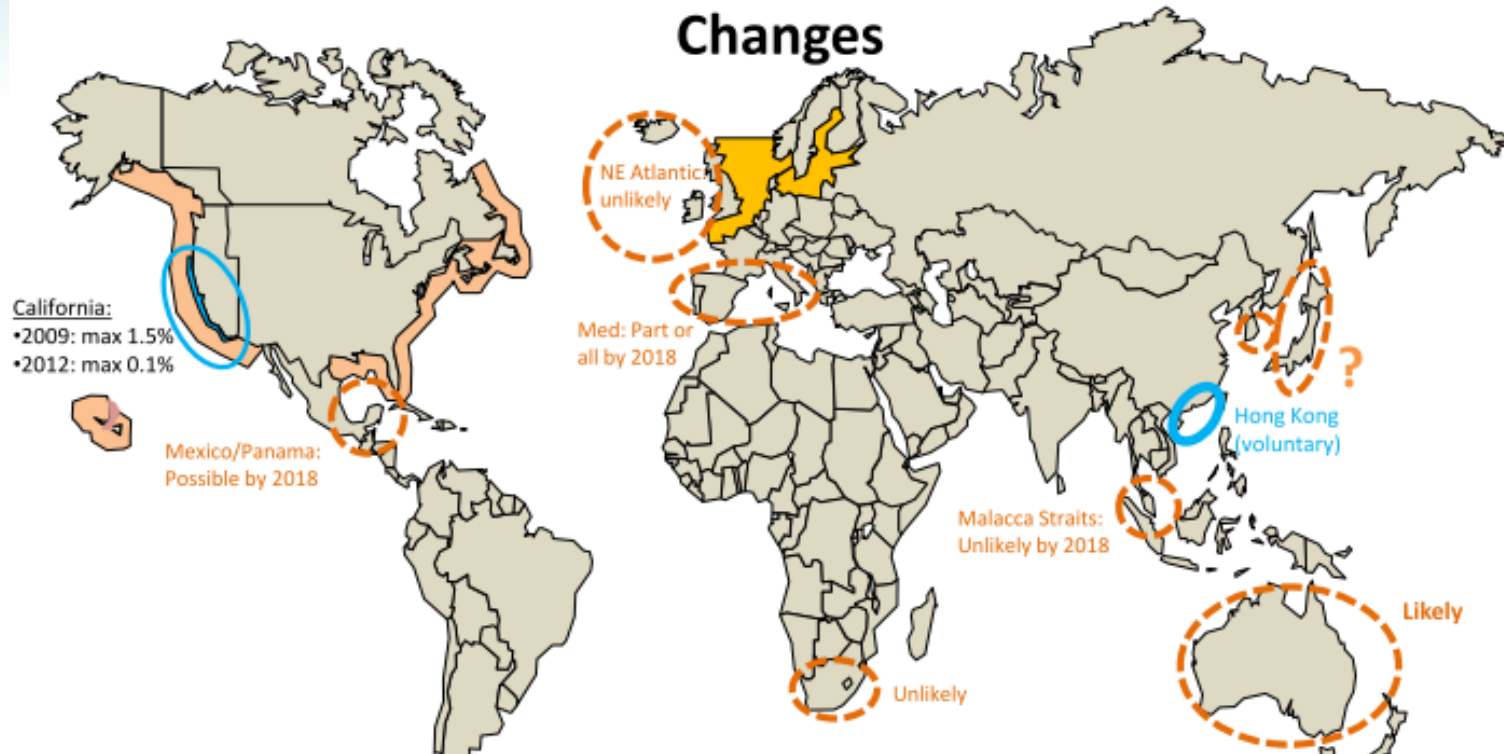
Proposed implementation schedule has four steps

Ratified at the October 2008 IMO MEPC meeting



Emission control areas

Emission Control Areas and Timeline for Bunker Sulphur Changes



<p><u>Existing:</u></p> <ul style="list-style-type: none"> •Baltic Sea (2006) •North Sea (2007) 	<p><u>Planned:</u></p> <p>US and Canada: from August 2012</p>	<p><u>Possible:</u></p> <ul style="list-style-type: none"> •Mediterranean •South Korea •Malacca Straits
---	--	--

Impact on shipping & refining (1)

Shipping Industry

- Requires low cost fuel – very competitive market
- Capital investment and added complexity of scrubbers is a concern
- Facing complex regulatory environment
 - Uncertain ECA and global regulation schedule
 - NO_x, PM and perhaps CO₂

Refining Industry

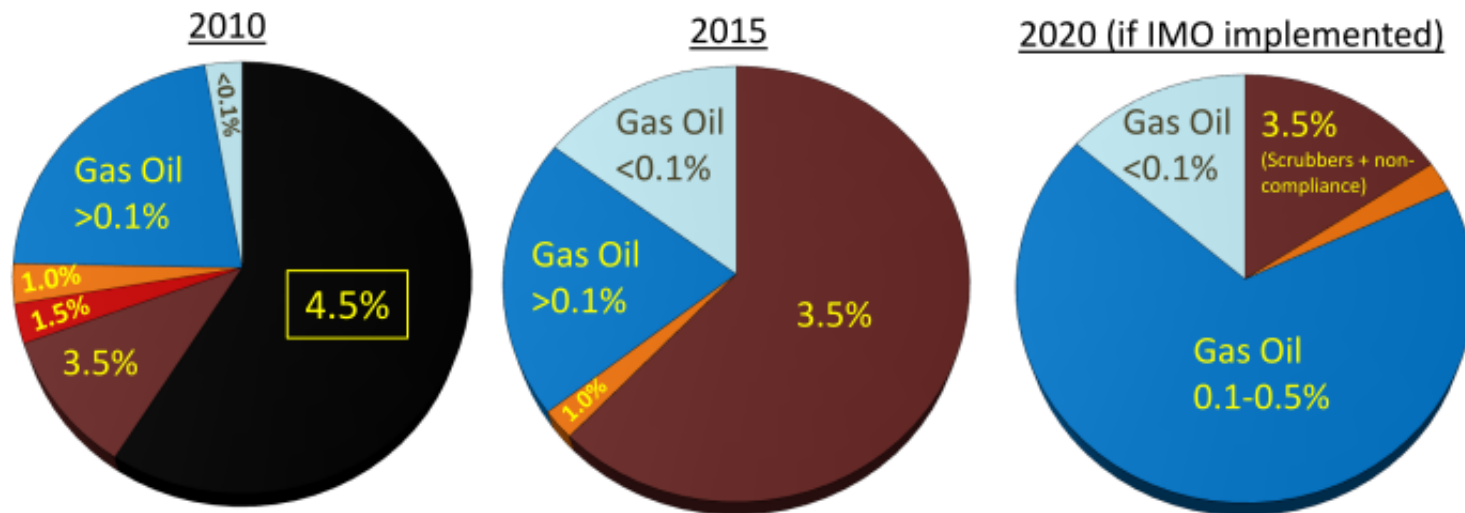
- Bunker fuel has traditionally been a low-value by-product
- Difficult to envision investing for bunker production
- Stranded investment risk if emissions technology evolves
- Concerned with magnitude of investment required
- Removes an outlet for residues produced from high sulphur crudes
- Similar investment to make road diesel is much less risky – so some current bunker suppliers may choose to withdraw from the market

Impact on shipping & refining (2)

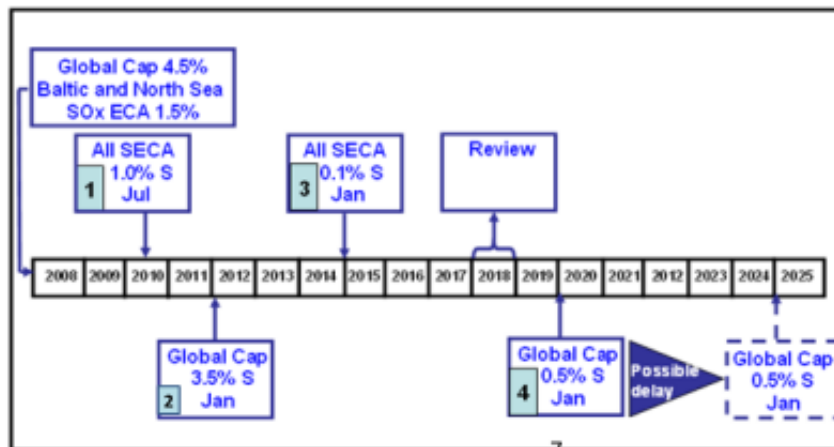
- **Scrubbing of stack gases, while still developing, has the potential to significantly reduce compliance cost**
 - Degree of scrubber adoption will have a direct effect on refiners
 - The uncertainty of this variable was examined through two scenarios:
 - **Scrubber Compliance** – Broad scrubbing adoption for key ship types and routes which moderates the need for fuel quality improvements
 - **Moderate refining industry impact**
 - **Fuels Compliance** – Stringent and disruptive case for refining, suppliers and bunker consumers
 - **Significant refining industry impact**

Shift to distillate fuels

Projected Composition of Bunker Fuel Market 2010-2030 IF IMO legislation implemented in 2020



Around 6% of bunker fuel to remain HSFO, due to scrubbers. Some non-compliance expected



Thank you
