ECASBA

European Seminar

6th / 7th June2012

”GOING GREEN”

- Challenges and opportunities
- Impact on the agency and shipbroking sectors

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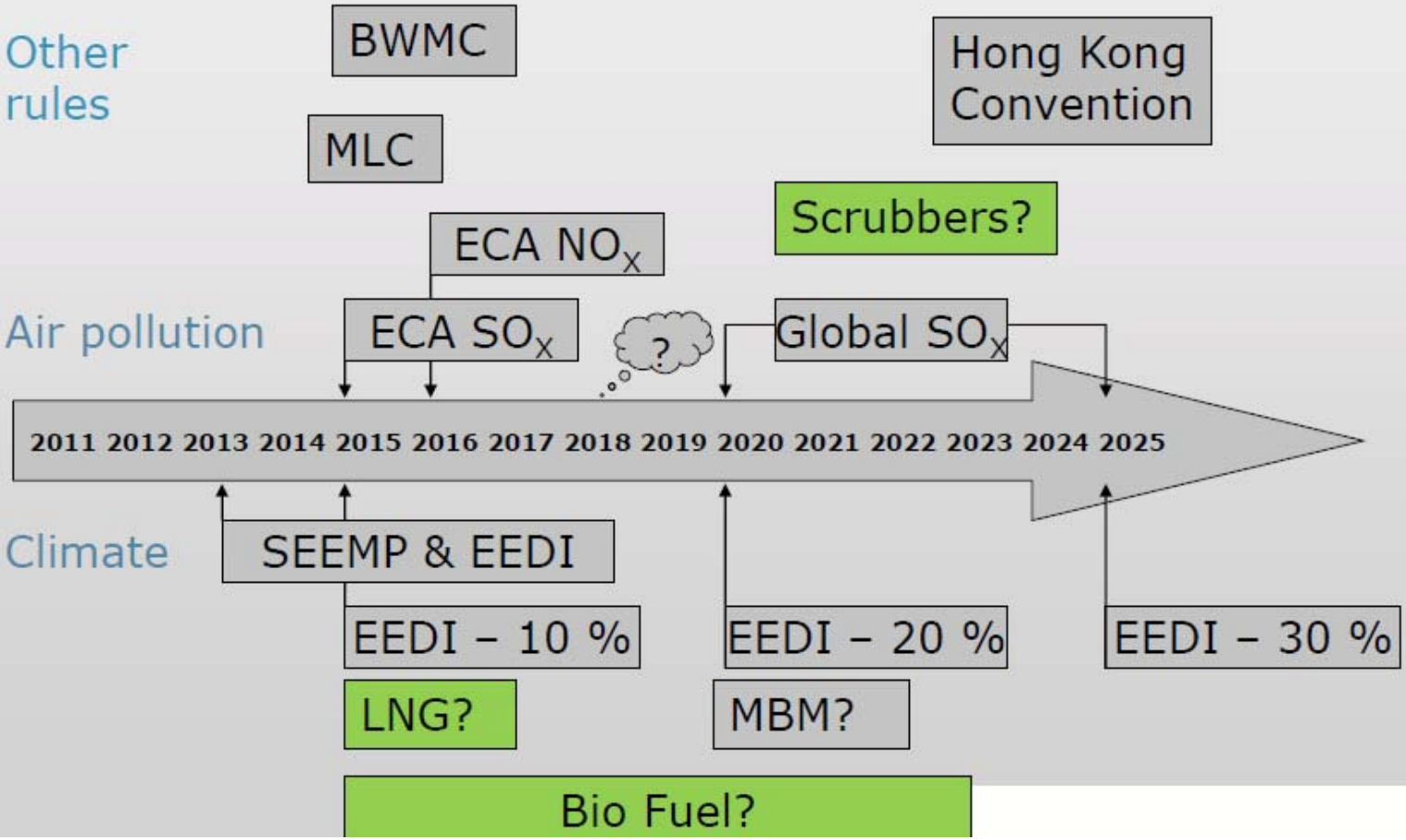
15 years of environmental regulation



The environment

Focus on emissions of
- CO_2
- SO_x and particles
- NO_x

Furthermore focus on
- Noise
- Waste water /sludge
- Garbage handling
- Scrapping
- Ballast water

CO_2 Emissions

Already reduced 2008/2012 by 10% to 20% and further:

Slow steaming:
- Changed schedules
- Reduced time in port = more time at sea

New technology:
- New ships with better engines
- Larger ships
- Seaplanner –optimal route planning
- Cleaning of hulls between dockings
- New propellers (optimized to slow speed – very effective)

Motivation:
- Knowledge sharing

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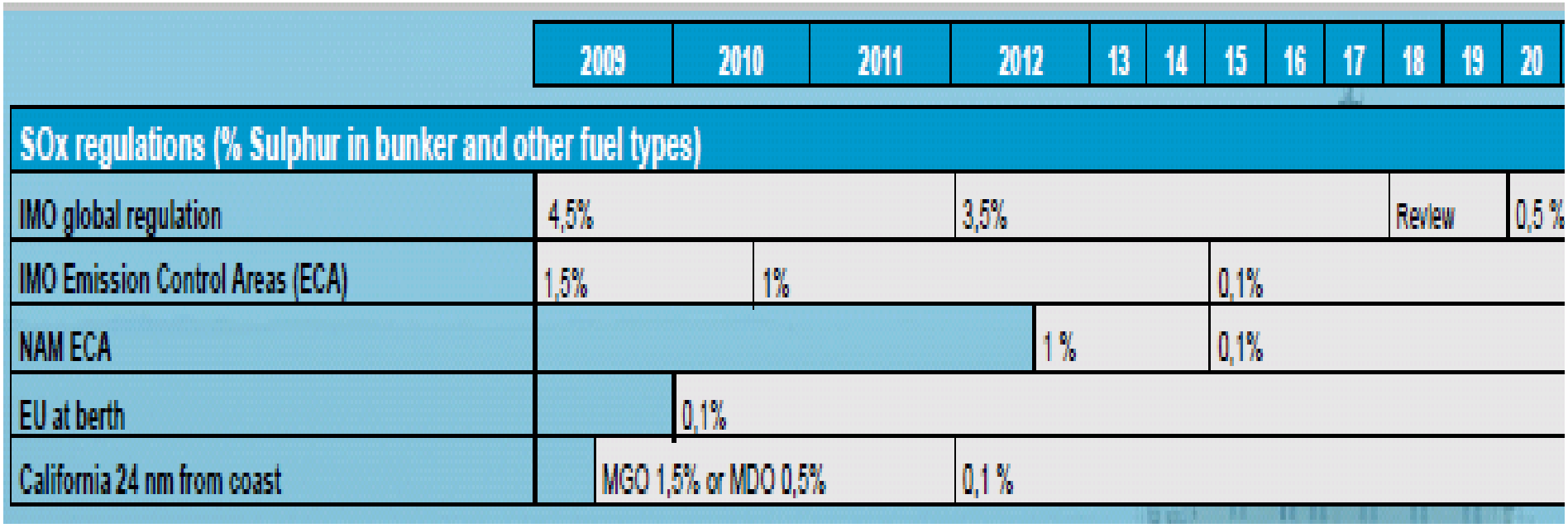
Sulphur Emission – Marpol Annex VI



Definition of the SECA

Availability of Marine Distillate Fuel Oil

- Will the fuel be available
- Global energy demand rising
- Refinery investment to meet demand falling behind
- Insufficient refinery capacity

Effects

- SECA fuel annual consumption around 15,7 million tons
- Additional costs due to fuel switch based on todays prices around 4 billion US Dollars
- However great uncertainty with regard to price difference

SO_x – How to reduce

Heavy fuel oil
- After treatment
- Scrubber technology
- NO_x Reduction

Marine gas oil
- Compliant engine
- NO_x Reduction

LNG

Biofuel / Methanol

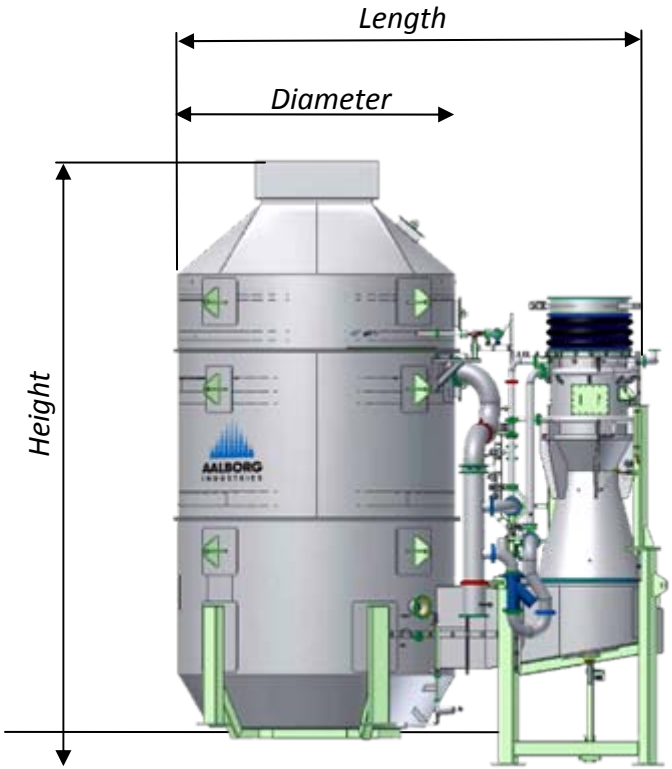
New Technologies

Scrubber Technology

•Wash the sulphur out of the exhaust gas
•One of the first scrubbers in the world on main engine 2008 / 2012

- July 2009: Installation
- April 2010: First live test
- April 2011: Corroded piping system
- Nov. 2011: Scrubber back in test
- 2012: Expected final approval

Main Equipment



Technical data:

In operation since	May 2010
Height	10.5 metres
Length	8.2 metres
Diameter	4.6 metres
Weight empty	24T
Weight with water	32T
Exhaust gas	192,000 Kg/h
Material	SS alloys
PM Scrubbing	Jet + venturi
Sea water pump	200KW/1000m^3/h

Main Equipment Installation

Funnel -Modification

SCR is the Most Effective Way to Reduce NO_x and Comply with IMO Regulations

Technology	NOx Reduction Potential
Basic internal engine modifications	- 20%
Exhaust gas recirculation (4-stroke)	- 35%
Direct water injection	- 50%
Humid air motor	- 70%
SCR (Selective Catalytic Reduction)	- 95%

LNG (Liquefied Natural Gas)

- Environmental and climatic advantages compared to oil-based fuels
- Newbuildings or retrofitted tonnage
- Availability of marine LNG, distribution and filling station infrastructure

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New Technologies

How can ship owners and operators manage compliance with environmental regulations?

”They can because they must!”

However, it is not always easy to know what to comply with

The Trade encourages a strong enforcement regime in particular in ECAs after 2015

•An AFRAMAX tanker can save more than $150.000 on a trip from North Atlantic to Primorsk and back again by being non-compliant

SO_x – Consequences of more expensive oil

- Major increases of freight rates 20 – 40% to / from Baltic
  (For Finland only, almost 1% of GDP)
- Loss of competitiveness to road transport
- Risk of modal shift
- More traffic on roads
- Risk of downscaling numbers of routes sailing in parallel with land transport corridors

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”Yes, it is good to be green, but today it is more about survival”

”Or perhaps it is just down to the understanding that there is no shirking from our responsibilities as an industry”