



# Sustainable Shipping

**What are we doing now and what of the future?**

**Rod Nairn, AM  
Chief Executive Officer, Shipping Australia Limited**

[www.shippingaustralia.com.au](http://www.shippingaustralia.com.au)

# Sustainable Shipping

- Shipping is the most environmentally efficient mode of long haul transport (tonnes/km)
- To be sustainable, shipping must be:
  - Economically viable
  - Environmentally proactive
  - Socially responsible
- Economic viability is the most crucial factor
- A major risk to sustainable shipping is inappropriate regulation

# Shipping Australia Limited – who we are

- ▶ A peak national industry body comprising 37 shipping lines and shipping agents and 50 corporate associate members
- ▶ Shipping lines/agents involved with over 70% of Australia's container trade and car trade and over 60% of the bulk and break-bulk trade
- ▶ Our members employ around 3,000 staff in 250 offices in 41 Australian ports
- ▶ Operate tugs and cruise ships
- ▶ SAL publishes an industry magazine and free electronic newsletter *eSignal*



# Shipping Australia Limited – full members

APL Lines (Australia)  
A.P. Moller-Maersk A/S  
Asiaworld Shipping Services Pty Ltd  
Austral Asia Line Pte Ltd  
BBC Chartering Australia Pty Ltd  
CMA CGM  
Evergreen Marine Australia Pty Ltd  
Five Star Shipping & Agency Co Pty  
Ltd  
Gulf Agency Company (Australia)  
Pty Ltd  
Hamburg Sud Australia Pty Ltd  
Hapag-Lloyd Australia Pty Ltd  
Hyundai Merchant Marine  
Inchcape Shipping Services  
“K” Line (Australia) Pty Ltd  
A.P. Moller-Maersk A/S

Mediterranean Shipping Co (Aust)  
Pty Ltd  
Mitsui OSK Lines (Australia) Pty Ltd  
Monson Agencies Australia Pty Ltd  
NYK Line (Australia) Pty Ltd  
OOCL (Australia) Pty Ltd Pacific Asia  
Express Pty Ltd  
PB Towage  
Royal Caribbean International  
Seaway Agencies Pty Ltd  
Ship Agency Services Pty Ltd  
Sturrock Grindrod Maritime Pty Ltd  
Svitzer Australia Pty Ltd  
The China Navigation Company  
Pte Ltd  
Wallenius Wilhelmsen Logistics  
Wilhelmsen Ships Service

# Shipping Australia Limited – what we do

We monitor and engage in many areas of direct interest to our members:

- ▶ Infrastructure
- ▶ Shipping trade innovation
- ▶ Environment
- ▶ Maritime security/piracy
- ▶ Industrial relations
- ▶ Regulation
- ▶ Costs, charges, levies, gst
- ▶ Border agencies



We help governments develop and better policies

# Why is shipping important?

## 10/11 Maritime trade contributed:

- \$368Bn pa. Imports & Exports
- 790 million tonnes pa.
- Over 99% of trade by Volume
- Over 3500 individual international ships annually
- Around 30 000 port calls annually

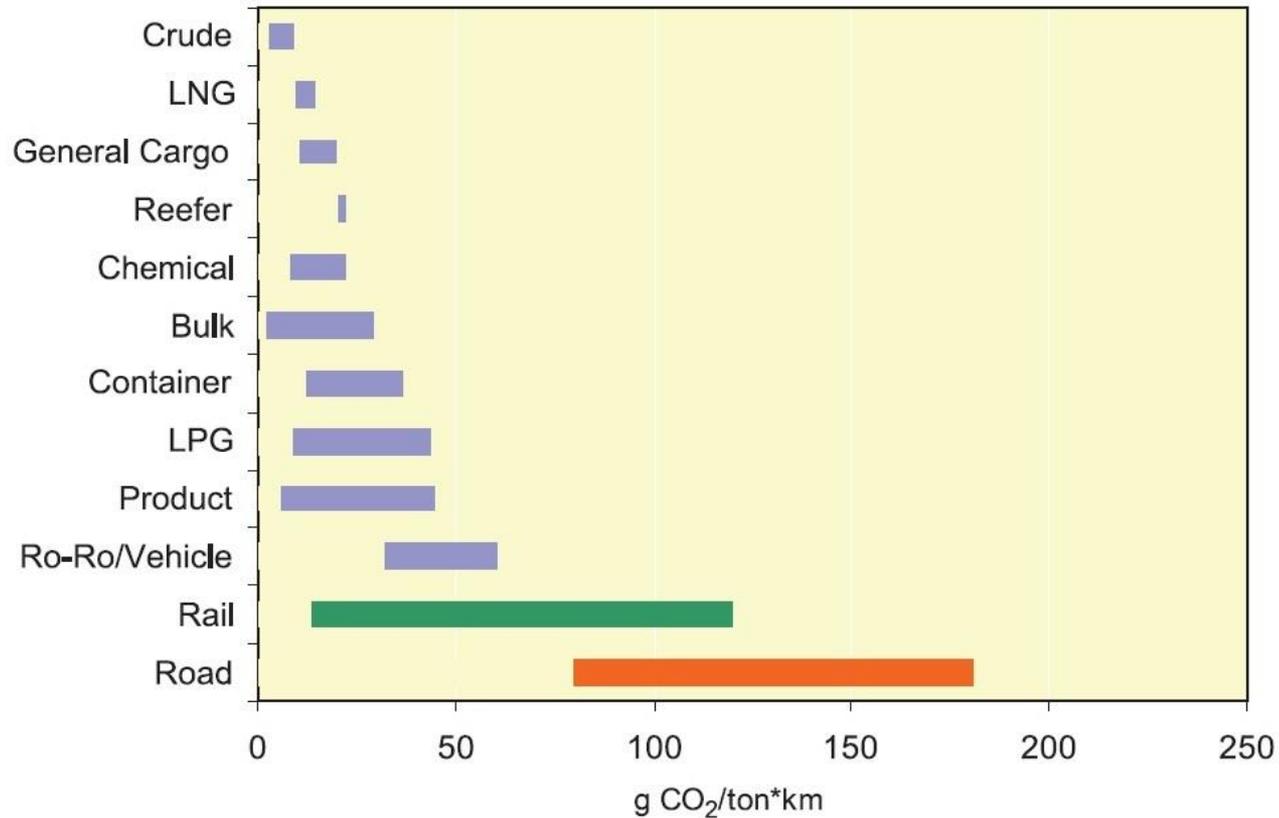
# The Australian Sea-Freight Task

- ▶ Australia has the fourth largest international sea-freight task in the world measured in tonnes per kilometre carried
  - ▶ Much of this is due to bulk cargo
  - ▶ Two largest coal ports in the world – Newcastle and Hay Pt
  - ▶ Largest Iron Ore port – Port Hedland
  - ▶ Only 2 container ports in the top 100
    - ▶ Melb 58 (2.49m), Syd 66 (2.15m) [Adel (0.28m)]
- ▶ Coastline spans 30,000 kilometres
- ▶ 2011-12 we imported \$186 billion of products and exported \$236 billion by sea
- ▶ 4875 cargo ships made 32,405 calls at 79 Australian ports

# Sustainable Shipping

Shipping is the most environmentally efficient mode of long haul transport (tonnes/km)

# Shipping – the least polluting mode of transport



# Australian Freight Task

- ▶ Currently 500 billion tonne kilometres
- ▶ Predicted to double to 1000 billion tonne kms by 2030
- ▶ 1400 billion tonne kms by 2050

**So**, if we want to minimise the environmental impact of freight movement...

- There is a critical need for more coastal shipping!

But 2012 changes to coastal trading legislation haven't helped.

## Coastal shipping trends

- 2% decrease in coastal shipping in 2012-13
- Licenced foreign ships conducted:
  - 100 fewer coastal voyages
  - Moved 2 million fewer tons of coastal cargo
- Australian registered coastal vessels reduced from 30 in 2006-07 to just 13 in 2012-13  
(this decline was underway before the CTA changes)

Inappropriate legislation, aimed at protecting a non-competitive industry, has failed to achieve its purpose and driven a modal shift from shipping to road and rail. This has adversely impacted the environment, Australian manufacturers and primary producers.

***Killing the demand for coastal shipping will not revive the Australian shipping industry.***

# Sustainable Shipping

To be sustainable, shipping must be:

Environmentally proactive

Economically viable

Socially responsible



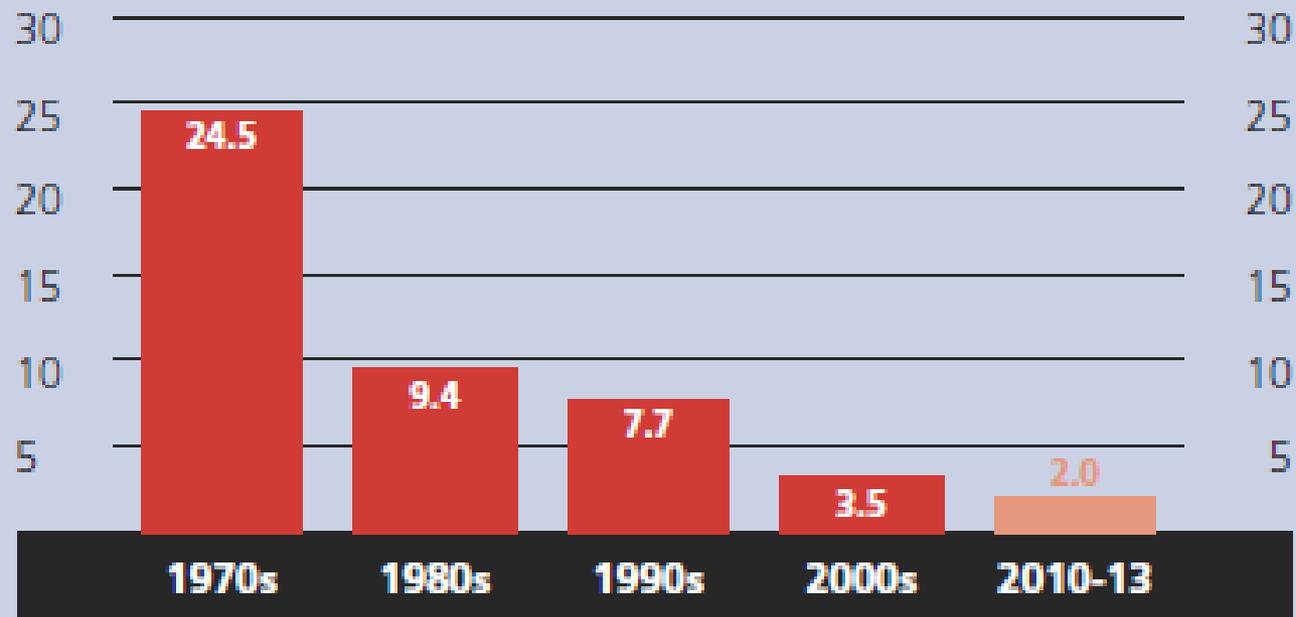
# Environmentally proactive – IMO Initiatives

- ▶ Improved navigation systems and standards of training
  - ▶ Compulsory ECDIS supported by Electronic Navigational Charts (ENC)
- ▶ Double hulled tankers
- ▶ Protected bunker tanks in commercial ships - MEPC141(54)
- ▶ Ballast water management – regulations and treatment
- ▶ MARPOL (prevention of Maritime Pollution)
  - ▶ CO2 reduction targets
  - ▶ Sulphur reduction limits
  - ▶ Garbage disposal, oil and chemical discharges
- ▶ Nairobi wreck removal convention

# Environmentally Proactive – safer shipping

## REDUCTION IN MAJOR OIL SPILLS

Average number of major oil spills per year (over 700 tonnes)

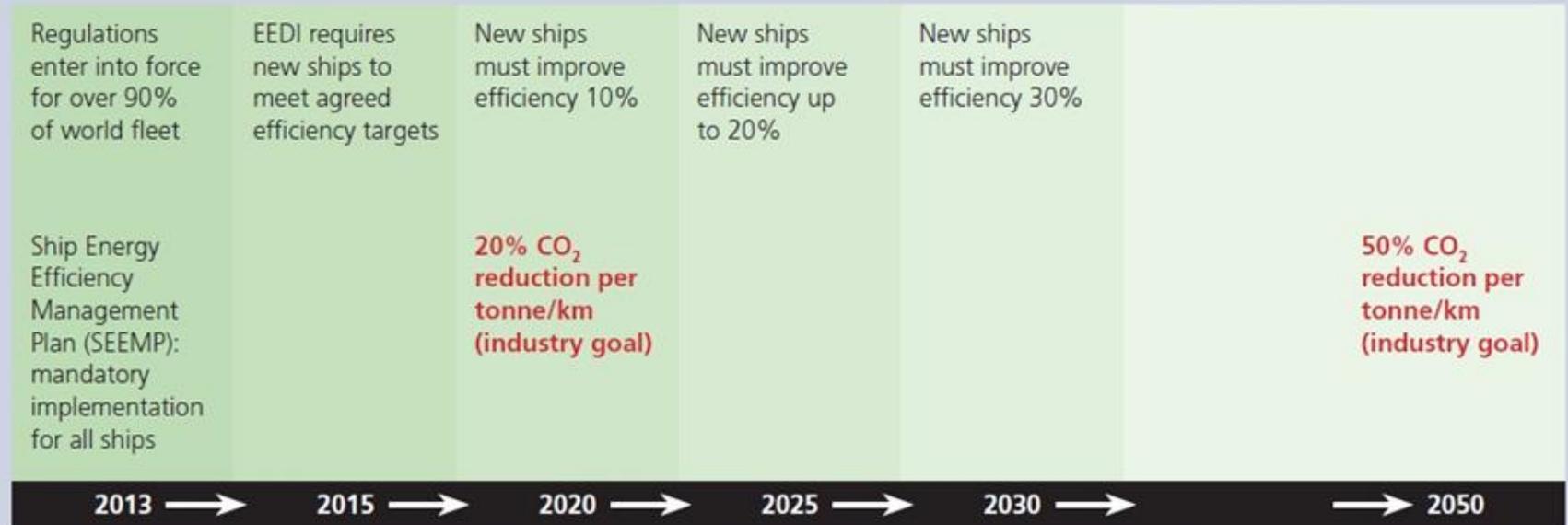


Source: ITOPF

# IMO Targets - Energy Efficiency Management Plan (SEEMP) and Energy Efficiency Design Index

## IMO AGREEMENT WILL REDUCE SHIPS' CO<sub>2</sub>

MARPOL Annex VI, Chapter 4 adopted July 2011



# Environmentally proactive – safer shipping

## AMSA Initiatives

- ▶ Particularly sensitive sea areas, eg. Torres Strait, GBR, Coral Sea
- ▶ Designated shipping routes, two way routes and areas to be avoided
- ▶ Compulsory pilotage areas
- ▶ Under keel management system (Torres Strait)
- ▶ Vessel traffic management systems – Reef VTS
- ▶ Improved navigation charts (Australian Hydrographic Service)
  - ▶ New Electronic Navigational Charts (ENC) for Australia's maritime area

# Environmentally proactive - What we are doing now

- ▶ Shipping fuel efficiency is being encouraged to meet
  - 20% reduction in GHG by 2020
  - 50% by 2050
  - Win/win with operational cost savings
- ▶ Slow steaming, sail assistance, hull cleaning
- ▶ Bigger ships, more efficient hull shapes
- ▶ LNG fuelled ships
- ▶ Ballast water management and treatment systems, hull bio-fouling under the microscope
- ▶ Protectively located bunker tanks MEPC141(54)

# What are we doing now?

## **CMA CGM**

Retrofitting more than 20 post-panamax or larger containerships to reduce fuel expenses by reducing the size of the bulbous bows.

Now that the operating speeds of the ships have been reduced through slow steaming, the smaller bulbous bows are said to reduce their fuel consumption by more than 5%.

This is estimated to save \$1m per year across the vessels

The ships to be modified range between 5500 and 11,500 teu.

Definitely cheaper than building new ships!

# What are we doing now?

## K-Line

- current largest 8,600 TEU vessels use 17% less than previous 5,500TEU vessels
  - Including the increased capacity that a saving of 48% fuel per container
- CO2 emission reduction goal for 2019 – 10%
  - To reduce their EEOI
- Develop the 'Drive GREEN' project
- 2013 Environmental Excellence Award from Port Authority of Longbeach – Green Flag Program

## What are we doing now?

**K Line** - Recognized by Climate Disclosure Program as Leader for Corporate Action on Climate Change and Its Transparency.

K Line has been recognized as a leader in reducing carbon emissions and mitigating the business risks of climate change, as well as disclosing the information, and was selected as member of both CDP's Japan Climate Disclosure Leadership Index (CDLI) and CDP's Japan 500 Climate Performance Leadership Index 2014(CPLI) for the first time at CDP's debriefing session in October 2014.

# What are we doing now?

## Maersk

In 2013:

- Maersk used 1.2 million tonnes of fuel less than the year before, and this contributed USD 764 million in savings.
- Reduced CO2 emissions by 12 % per container-kilometre. (Since 2007 this reduction is 33 %.)
- This translates into a cut in CO2 emissions by 3.8 million tonnes in 2013, while the business expanded by 4%.

This is a strong example of how sustainability and profitability can go hand in hand.

# What are we doing now?

## Hamburg-Sud

- Fuel efficiency - Reduced CO<sub>2</sub>, SO<sub>2</sub> and NO<sub>x</sub> emissions by 22.5% between 2009 and 2012.
- Hull efficiency and Becker 'Twisted Fin' to improve propeller efficiency
- Weather routing – using prevailing winds and currents to improve
- Ballast water treatment - New 'Cape San' class feature two stage ballast water treatment with filtration and UV sanitation to ensure not transfer of marine organisms.

# What are we doing now?

## Hapag-Lloyd

- High priority on environmental protection
- Worldwide fleet uses an average sulphur content of 2.1%; already well below the IMO limit of 3.5% outside defined ECAs.

# What are we doing now?

## **BBC Chartering** – fitting Skysails.

- ‘BBC SkySails’ offers charter clients the possibility for ‘greener’ sea transports.
- The 9,821 dwt vessel is fitted with the latest prototype of the SkySails auxiliary wind propulsion system.
- The system uses a kite with a surface measuring 320sqm which can deliver an engine load relief of up to 2,000 kW at favorable wind conditions.



# What are we doing now?

## GAC Eco-friendly in-water hull cleaning solution

- Efficiently cleans ships hull to reduce drag and improve fuel economy. Meets stringent Health, Safety, Security & Environment (HSSE) and compliance policies as well as all local and regional environmental regulations.
- Captures residues and harmful marine growths during cleaning for disposal of in an environmentally-friendly manner



# What of the future?

## Wallenius Wilhelmsen Logistics

WWL has created the vessel E/S Orcelle and the marine terminal Castor Green Terminal as the clear and compelling visions for a zero-emission future.

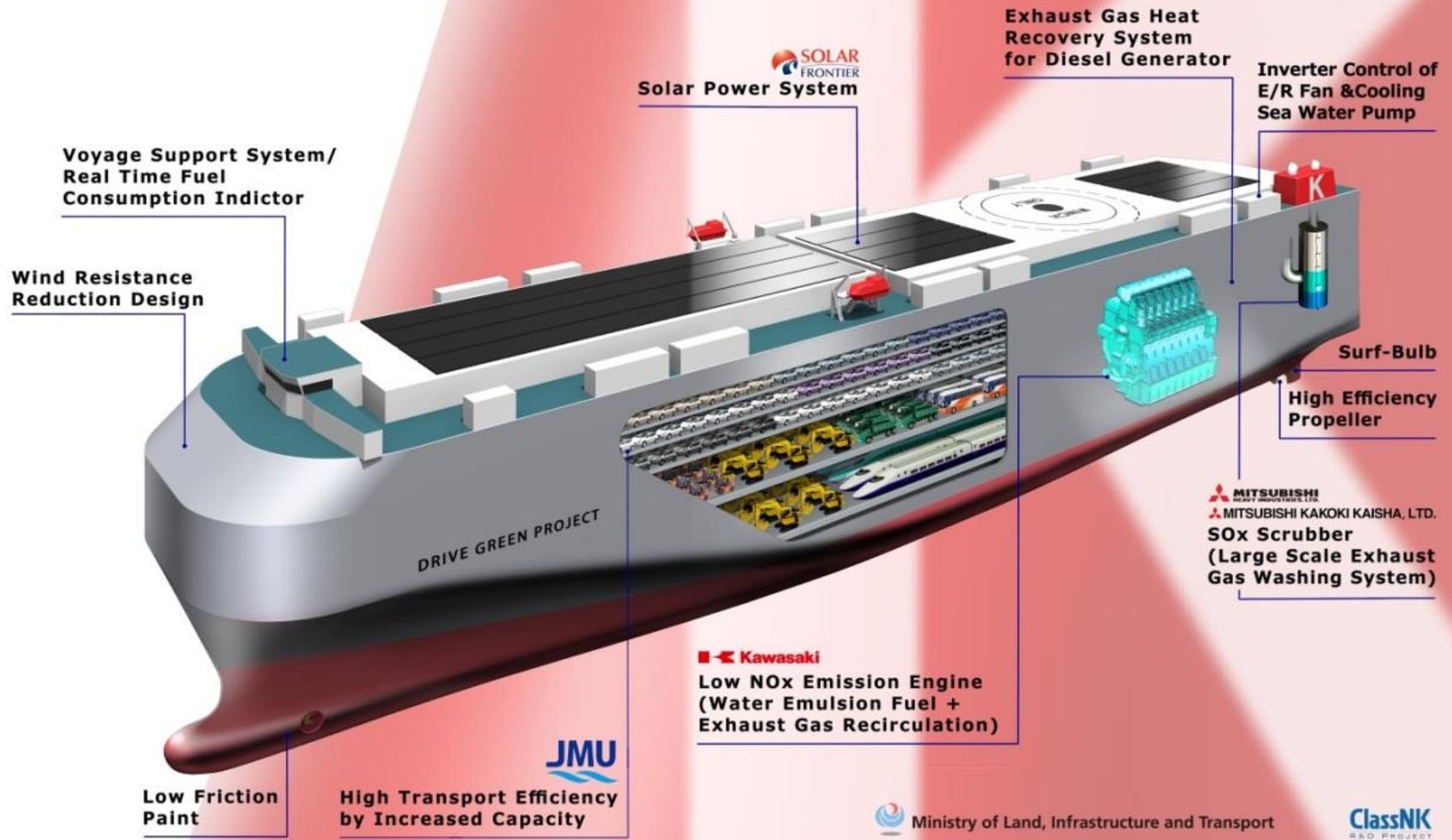
The E/S Orcelle uses renewable energy sources and fuel cells to generate the energy required to power the vessel. Its highly advanced design provides optimum cargo capacity to transport cars and other goods around the world more efficiently.

### No ballast water – no emissions

The E/S Orcelle represents our vision for zero-emission car carrying.



# DRIVE GREEN PROJECT



**Kawasaki**  
Low NOx Emission Engine  
(Water Emulsion Fuel +  
Exhaust Gas Recirculation)

**MITSUBISHI**  
HEAVY INDUSTRIES, LTD.  
MITSUBISHI KAKOKI KAISHA, LTD.  
SOx Scrubber  
(Large Scale Exhaust  
Gas Washing System)

Ministry of Land, Infrastructure and Transport

**ClassNK**  
R&D PROJECT

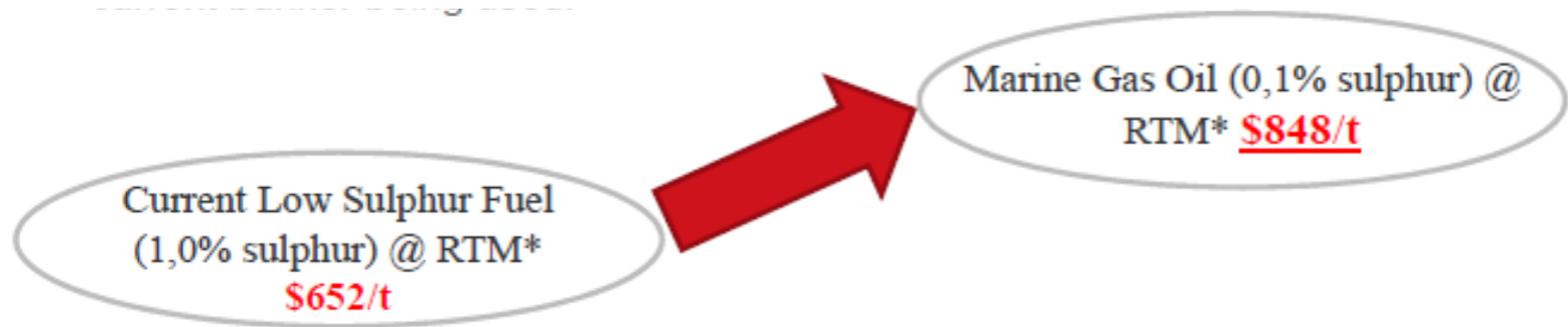
# Environmental protection – Restricting sulphur

Annex VI of the Maritime Convention for Prevention of Pollution at Sea (MARPOL) established emission control areas to combat pollution effects in high traffic areas.



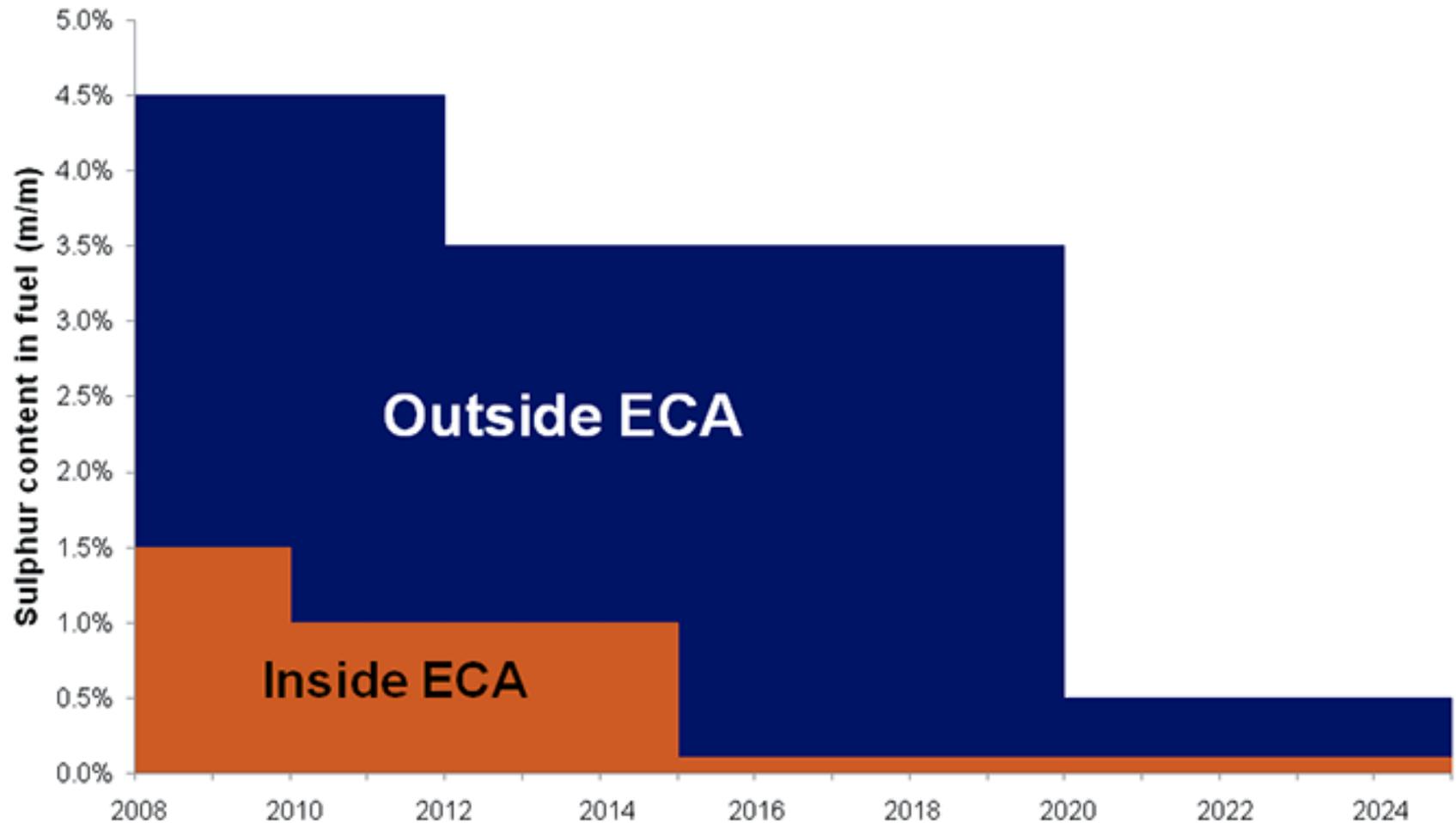
The permitted sulphur content for fuel used in these areas has been reduced from 1.5% in 2005 to 1% in 2010 and reduced to 0.1% from 1 January 2015.

## Low sulphur limits - Not such a 'WIN – WIN'



**30% increase of fuel costs**

## Shift to low sulphur fuels



Source: IMO, MARPOL Annex VI, Reg. 14



European Shortsea Network

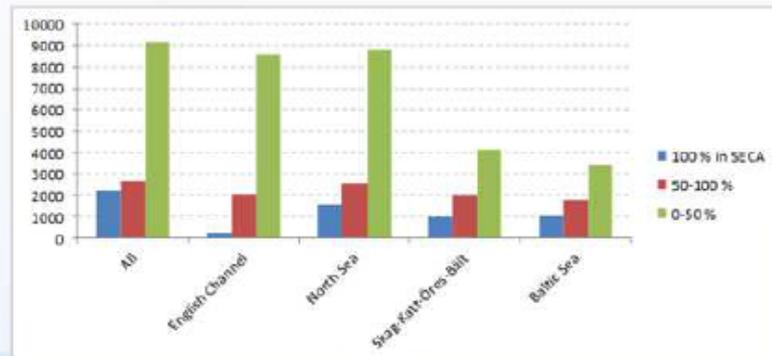
Your navigator  
from highway  
to **waterway**

# Vessels in SECA (Sulphur Emissions Control Area)

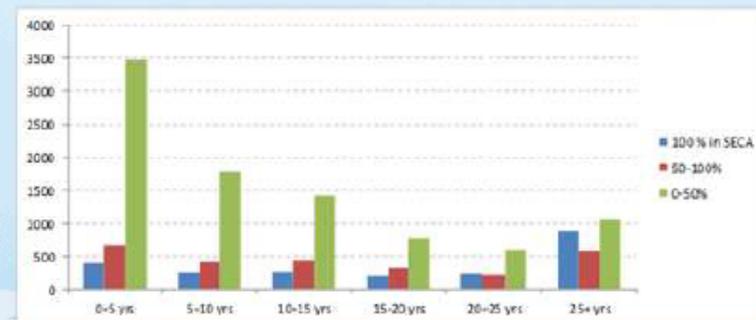
- at any time, on average about **5 000** ships in SECA
- more than **2 000** ships stay in the SECA 100 % of their operating time.
- **652** ships less than 10 years old and 100 % in SECA

## Cargo volumes

- North Sea: 1 828 million tonnes in 2011
- Baltic Sea: 839 million tonnes in 2012



Number of ships in the SECA by area and time spent in SECA



Number of ships in SECA by age of ship and time spent in SECA



European Shortsea Network

Your navigator  
from highway  
to **waterway**

## Fuels used

- the total fuel consumption of the vessel traffic in the SECA was approximately 17 million tons in 2011.
- approximately 12 000 different vessels/year

\* According to Ship Traffic Emissions Assessment Model (STEAM) of the Finnish Meteorological Institute

- ferry, ropax, ro-ro and container vessels consume most fuel
- 150 such ships trade 100 % in SECA
- risk of modal shift in this segment

### Status

- the large majority (**85 %**) of the fuel consumed is HFO (Heavy Fuel Oil).
- fuel consumption is the most important part of the total operating expenses
- price difference between HFO and MGO; currently around 300 US\$ per tonne



European Shortsea Network

Your navigator  
from highway  
to waterway

# Impacts

- several studies
- **scenarios** on the level of increase of transport costs, even 20-40 % expected
- different impacts due to geographical situation in the SECA; most severe for Finland
- influences on production, on industries in the region, ports and employment
- **modal back-shift** – competition with road and rail
- possible back-shift for SSS routes > routes with shorter sea leg

■ The Sulphur Emission Control Area (SECA)  
■ Countries with water only in SECA  
■ Countries with part of the coast in SECA  
■ Countries without coast in SECA





European Shortsea Network

Your navigator  
from highway  
to waterway

## Case – container Rotterdam - Oslofjord

- container and ro-ro competition with road
- case: a 40-foot container
- a vessel carrying 800 TEU / 400 FEU - 40 feet containers with a price difference of € 257/ton
- >> an increase of 8-10% of the cost of transport from port-gate to port-gate, i.e. including terminal handling in port at both ends.
- higher price increase for smaller vessels and ro-ro
- estimated backshift 3-7 % for transport to Norway



European Shortsea Network

Your navigator  
from highway  
to waterway

## Ship owners – plans for 2015

### ESN survey among the ship owners

- during first half of 2013
- several options could be selected in the survey
- MGO >> demand of MGO will increase significantly
- MGO availability is good
- minimal investments needed, but operation price will be high
- possible fuel switch – operation in SECA and other areas

### Plans for 2015

MGO	70 % the only option
newbuilding with LNG	12 %
retrofit LNG	15%
Scrubber	18 %
move their vessels to other areas	15 %

# Sustainable Shipping

Economic viability is the most crucial and  
challenging factor

# Sustainable Shipping - Economic Challenges

- Gross revenues flat over 18 months but costs rising continuously
- Shipping companies struggling to survive with sustained low rates
- Vessel sharing arrangements / consortia essential to maintain level of services and cost efficiency – threatened by regulation
- Rationalisations by merger, takeover or bankruptcy inevitable
- P3 Alliance rejected but M2 (Maersk/MSC) is significant
- Rationalisation of volumes – 5% layup of global container fleet but forward order book will increase volumes
- Higher cost fuels to meet international regulations
- Port visit costs - high

# Current Status of shipping - oversupply

- Ship volume oversupply in all sectors
- Charter rates near record lows (10 Oct 14, in USD, Baltic dry index)
  - Capesize at \$10542 per day                      year ago \$ 32383
  - Panamax at \$6917                                      Year ago \$10250
- Container ship rates low and flat
  - 5900 TEU at \$12000 per day
  - 3500 TEU at \$ 9000 per day

# Sustainable Shipping - Economic Challenges

Freight rates remain at uneconomic lows

**Table 6 – Typical freight rates \$A (converted at \$A1=\$0.93 US) including surcharge in the export trade to North/East Asia<sup>10</sup>**

Commodity	Type of container	Rate
Cotton	40 ft	\$800
Wool	40 ft	\$780
Metals	20 ft	\$460
Grain	20 ft	\$710
Waste paper	40 ft	\$160

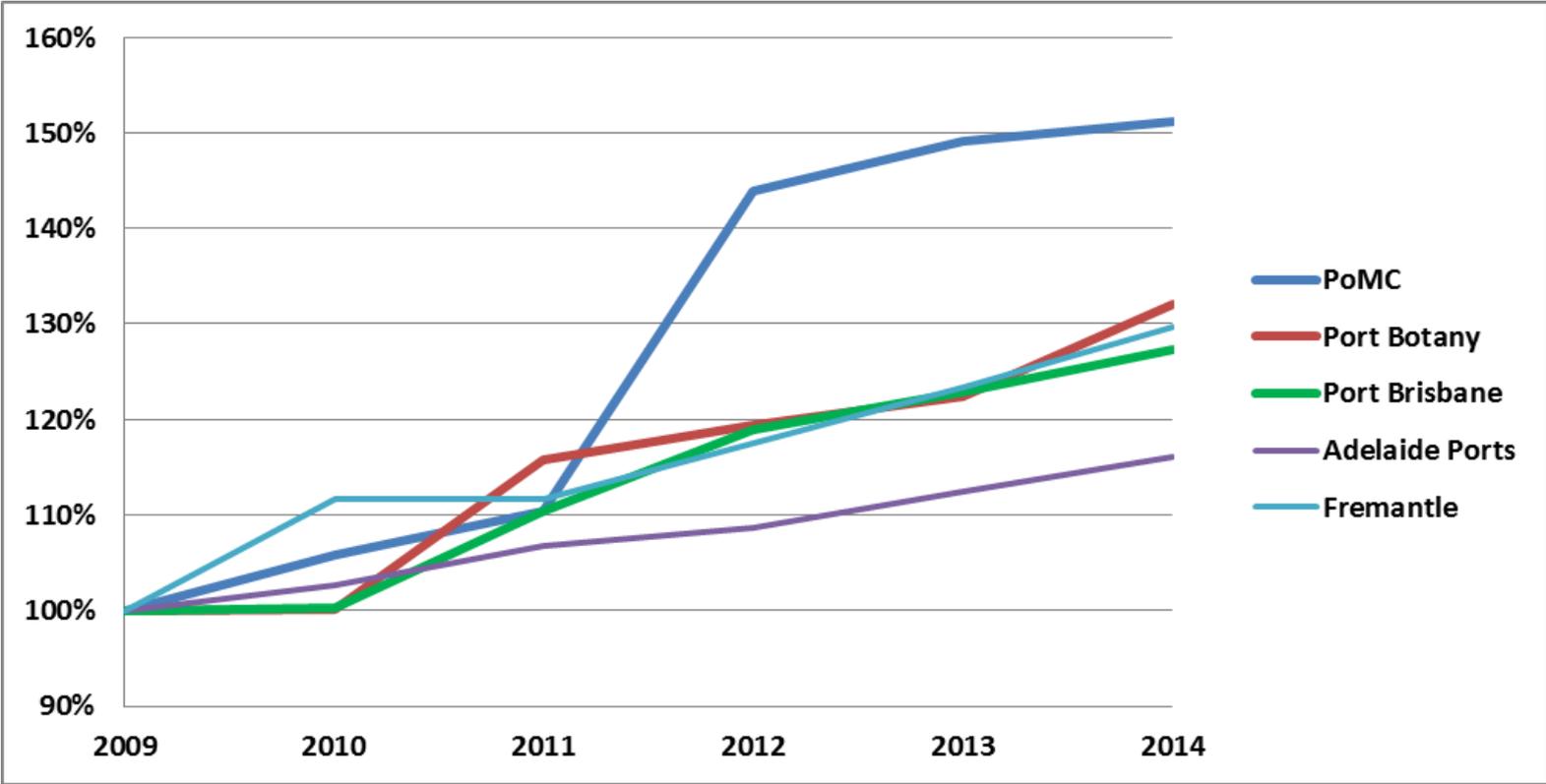
(iii) Average Gross Revenue Index

	To East Coast USA			
	Dry		Reefer	
	TEU	FEU	TEU	FEU
July '12	100	100	100	100
Jan '13	98	94	99	95
April '13	92	100	102	98
July '13	86	89	100	105
Jan '14	94	92	103	99
Apr '14	94	77	102	101
	To West Coast USA			
	Dry		Reefer	
	TEU	FEU	TEU	FEU
July '12	100	100	100	100
Jan '13	94	84	97	100
April '13	99	88	99	101
July '13	107	85	97	98
Jan '14	102	71	102	96
Apr '14	102	85	100	103

(ii) Average Gross Revenue Index<sup>9</sup>

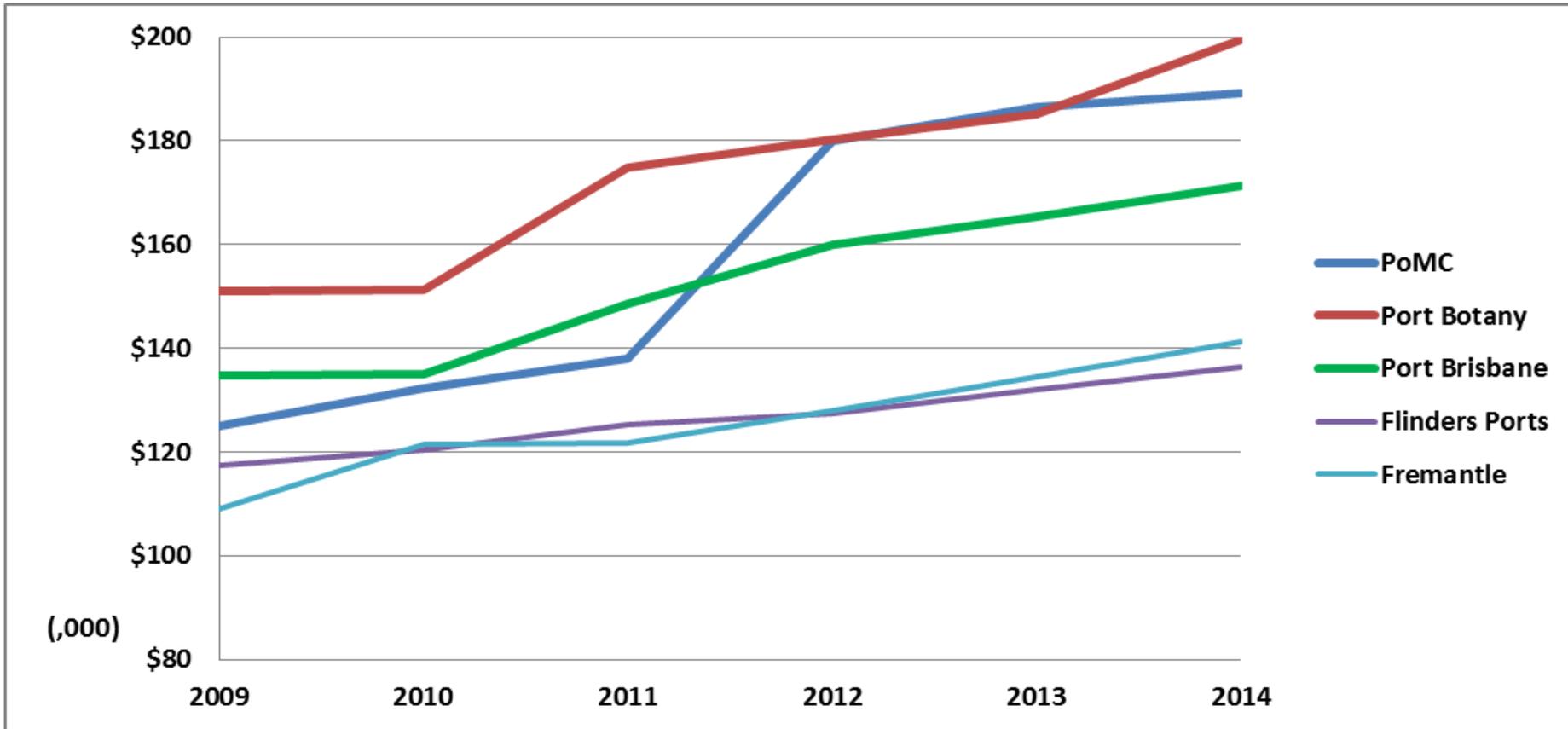
	Melbourne to Shanghai		Brisbane to Yokohama	
	Dry		Reefer	
	20FT/US\$	40FT/US\$	20FT/US\$	40FT/US\$
July '12	100	100	100	100
Jan '13	86	96	98	95
July '13	81	92	100	99
Jan '14	70	77	93	95
May '14	71	75	94	94

# Port charges increase index



# Port visit costs

Based on a hypothetical 4500 TEU ship (40,700GRT) vessel exchanging 1000 full import TEU, 500 full export, 200 empty export TEU. The following compares actual port costs

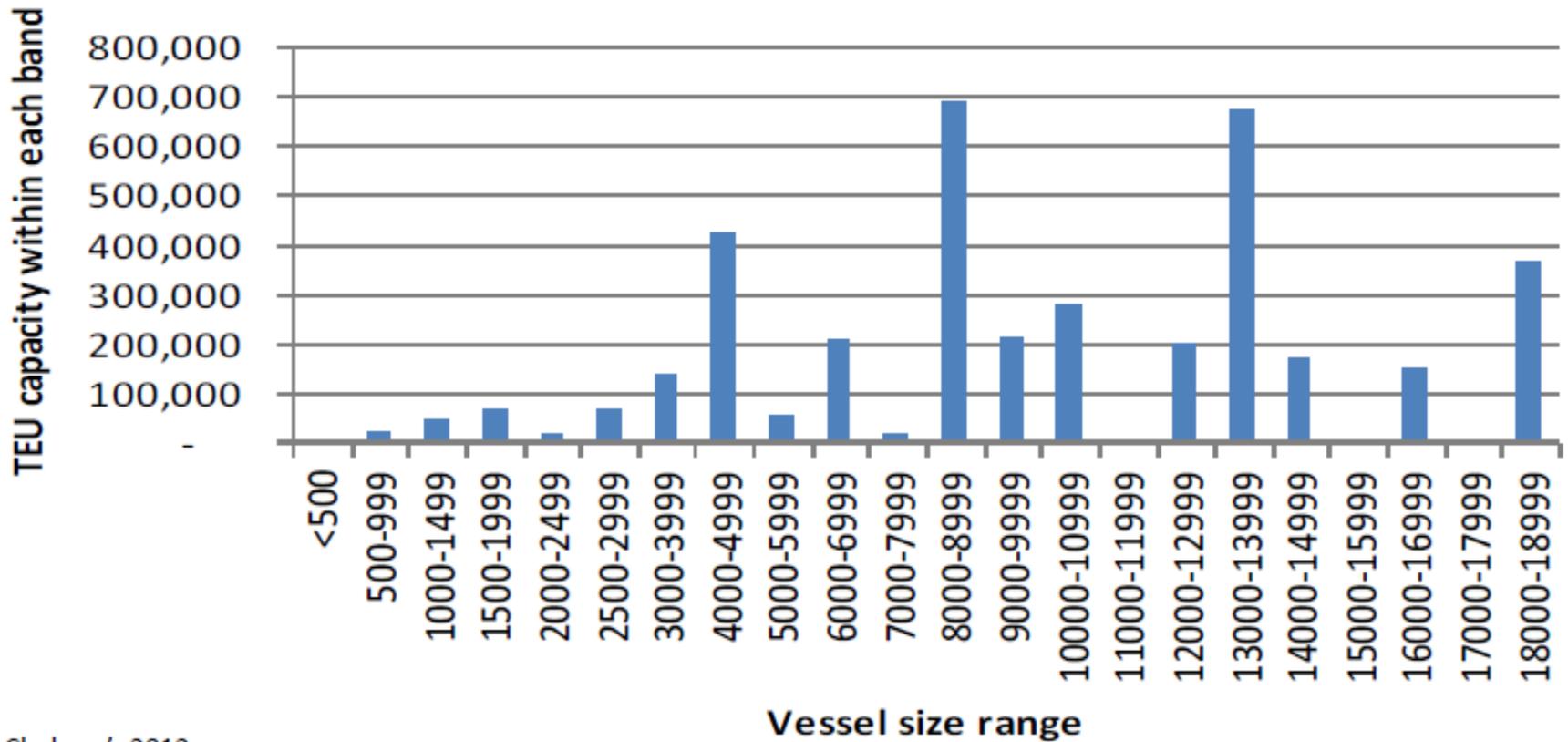


# Sustainable Shipping? Unsustainable equation

- ▶ Revenues
  - ▶ Rates – flat
  - ▶ Volumes – global 3% increase (driven by Asia/Europe)
- ▶ Costs
  - ▶ Increasing port costs, wages, fuel costs
  - ▶ Increasing compliance costs – ballast water/biofouling
  - ▶ Most savings from slow steaming and ship management already harvested
  - ▶ Savings from vessel sharing / consortia arrangements under threat from competition law changes

# What of the future? Container ships

## Orderbook - Total TEU by vessel size



Source: Clarkson's 2012

# What of the future? - Container Ships

- ▶ Continued push for economies of scale forcing move to bigger ships, smaller crew, more fuel efficient, environmentally compliant
  - Maersk Triple E – the gold standard but at 18300 TEU, 400m length 59m beam, 14.5m draught - few ports can take them
  - Bunker costs 35% less per TEU than previous 13000 TEU ship
  - Other ship efficiencies result in a total 40% saving
- ▶ Economies through VSA and Consortia
- ▶ Very few ships less than 3000 TEU on the order book
  - Could lead to a shortage in feeder (coastal trading?) market
- ▶ Cascade effect of larger ships onto Australian routes
  - ▶ 5200 – 5800 now commonly operating in Australia

# What of the future? Container ships

- ▶ Rationalisation of volumes and services
  - ▶ Two consortia announced reductions from 19 to 6 and 13 – 6 ships on Asia/Americas loops
  - ▶ Increase in scrapings
  - ▶ Fewer new orders for new-builds
  - ▶ Withdrawal of lines from uneconomic trades, rationalisation of port on existing loops and reduction in frequency in services
  - ▶ Shipping rates must increase

# Sustainable Shipping

Social responsibility - ensuring crew welfare and safety

# Social responsibility – ensuring welfare and safety

## Maritime Labour Convention

- Compliance with the MLC is a legally enforceable responsibility
  - This covers basic needs: pay, medical, living standards, food and leave
- Improving crew safety is a key focus area
  - 7 major lines have combined to share data on near misses and accidents to improve crew safety
  - Shipping accident rates are currently 10 times higher than OECD best practice land industry workers – there is room for improvement
- Reducing accident rates improves productivity

# Sustainable Shipping

An major risk to sustainable shipping inappropriate regulation

# The risk of inappropriate regulation

## Coastal Trading Act

- Inappropriate legislation, aimed at protecting a non-competitive industry, has failed to achieve its purpose and driven a modal shift from shipping to road and rail. This has adversely impacted the environment, Australian manufacturers and primary producers.

## NSW EPA Review of non road diesel – too much too soon?

- There are international practices for establishing Emission Control Areas if they are justified. Short notice changes to environmental regulations would impose unrecoverable costs on international shipping. The operational environmental standards of international vessels should be developed in accordance with international conventions and coordinated through the IMO.

# The risk of inappropriate regulation

## Australian Competition Law Review

The Harper review panel draft report has recommended repeal of Part X of the Competition and Consumer Act

Such action would substantially increase barriers to participation in the Australia liner trade by:

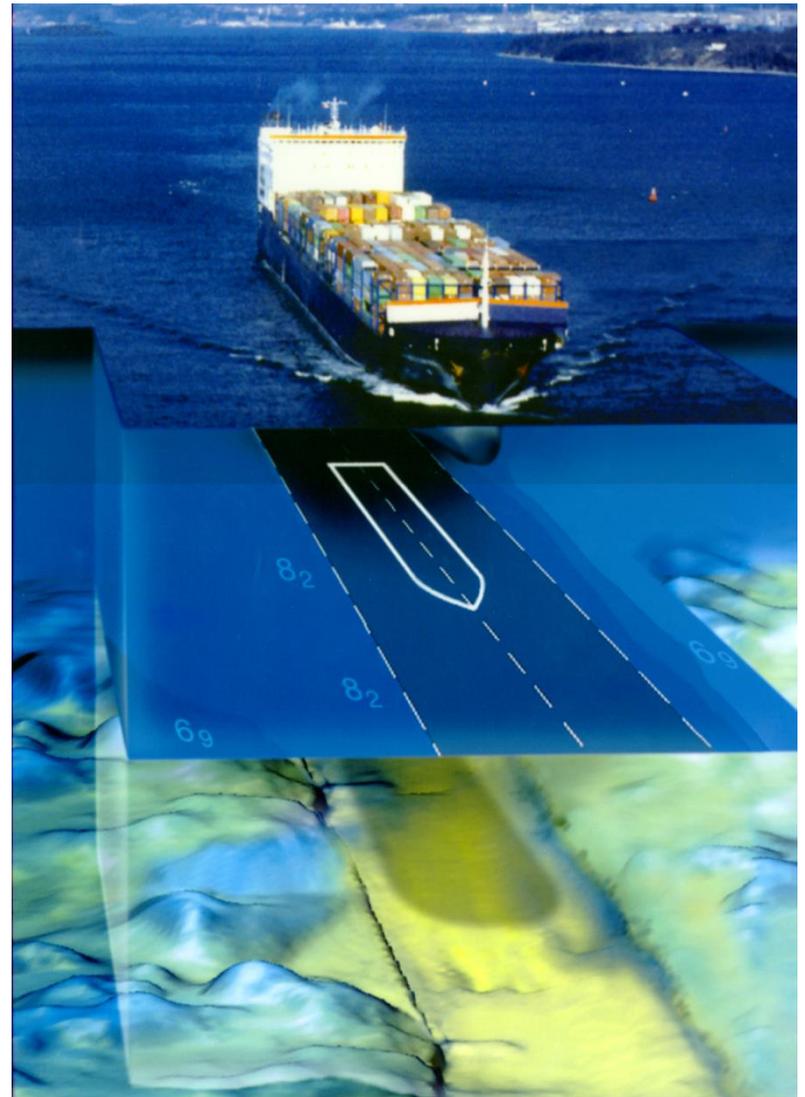
- Requiring costly authorisation application for current consortia activities
- replacing legislated clarity of exemption by uncertain ACCC decision
- Increase risk of prosecution and fine for any behaviour considered anti-competitive by the ACCC

The result would be less participation, reduced competition and higher costs for shipping.

# Sustainable Shipping

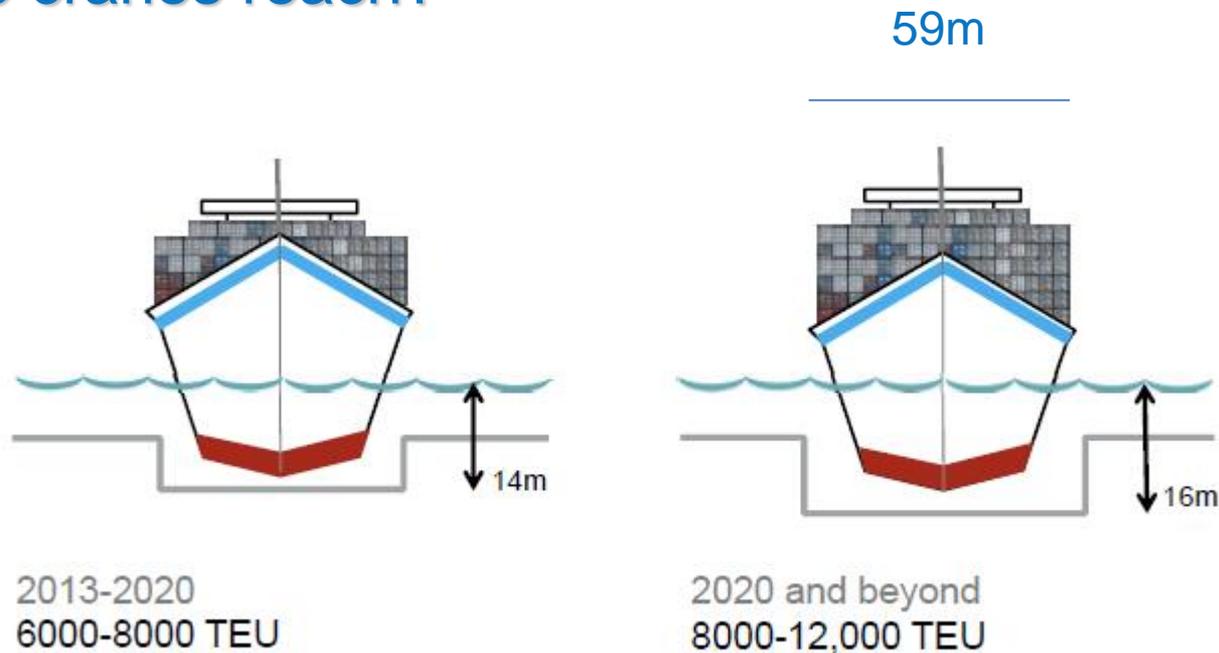
- Shipping is the most environmentally efficient mode of long haul transport (tonnes/km)
- To be sustainable, shipping must be:
  - Economically viable
  - Environmentally proactive
  - Socially responsible
- Economic viability is the most crucial factor
- A major risk to sustainable shipping is inappropriate regulation

# Questions?

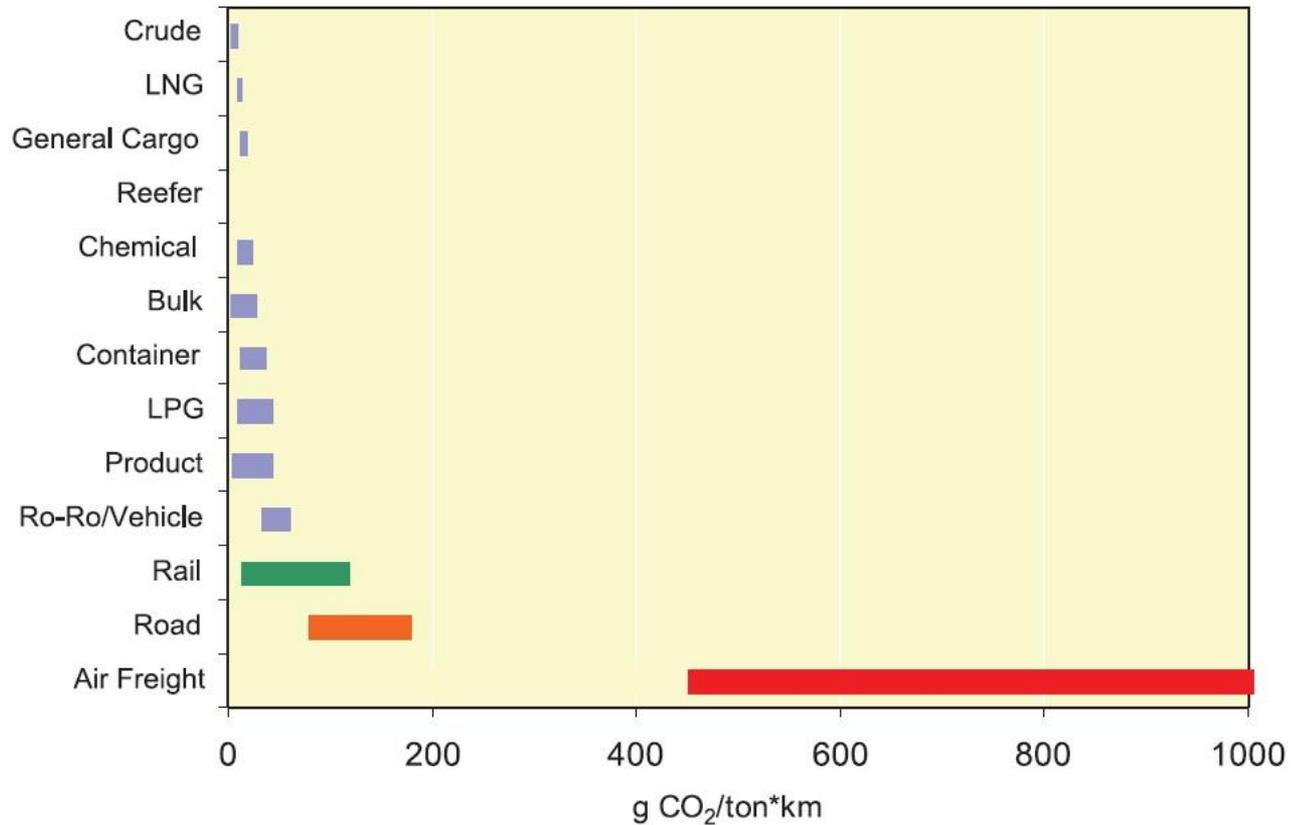


# Future Trends for Container Ships

Are ports ready?  
Can they bunker LNG?  
Do the cranes reach?



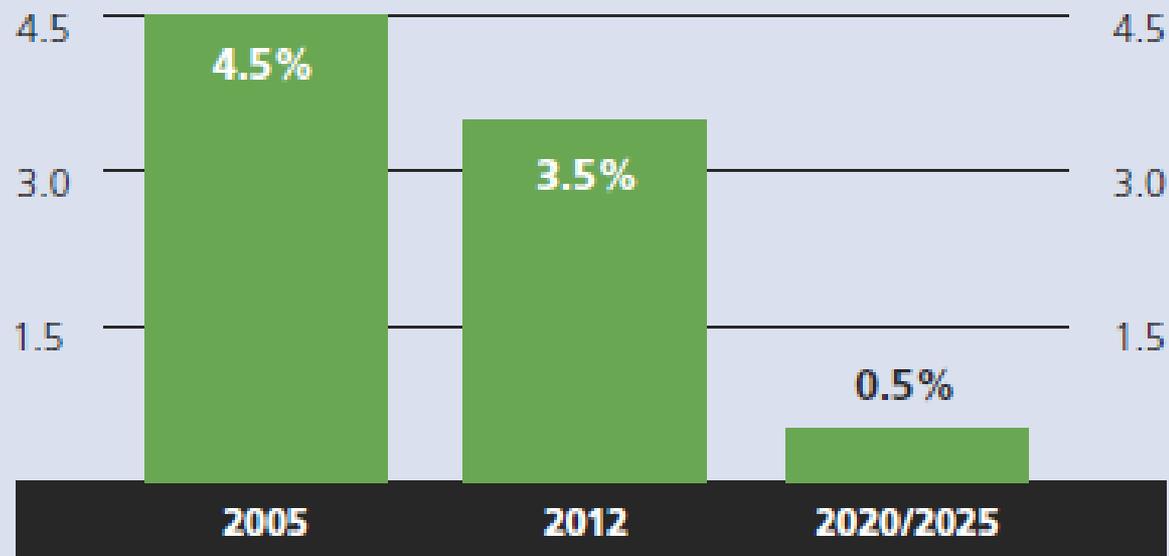
# Typical range of ship CO<sub>2</sub> efficiencies compared to rail, road and air freight



# Environmentally Proactive – IMO MARPOL

## GLOBAL SULPHUR CAP

Sulphur content of fuel permitted outside Emission Control Areas



# Environmentally Proactive – IMO MARPOL

## IMO AGREEMENT TO REDUCE ATMOSPHERIC POLLUTION FROM SHIPS

Sulphur content of fuel permitted in Emission Control Areas

