

**AAPA Greenport Americas 2010**  
May 6, 2010

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# Greening the Global Logistics Chain The Shipping Line's Perspective



# The A.P. Moller–Maersk Group

## A.P. Moller-Maersk Group

HQ: Copenhagen, Denmark

- **2009 Revenue: USD \$48.5 b** in Shipping, Energy, Retail and Banking.
- **115,000 employees, 130 countries.**



# A.P. Moller-Maersk transportation businesses in North America

- Maersk Line Limited – US-flagged vessels
- Maersk Line North America – Sales, operations & inland transportation contracting (rail & trucking)
- APM Terminals Americas – Marine terminals
- Maersk Equipment Services – Equipment and maintenance
- Direct ChassisLink – **NEW** Neutral chassis leasing business
- Bridge Terminal Transport – Trucking and
- Maersk Distribution Services Inc. – Ware
- Gilbert -- Warehousing & logistics
- Damco – Third-party logistics



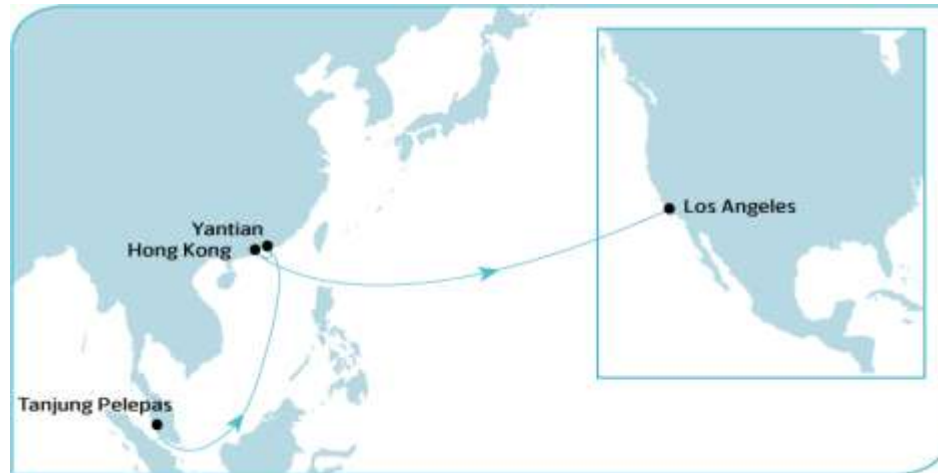


# Maersk Line – Container Shipping

- Operations
  - 500+ vessels
  - Moves approx. 1.8 million containers
- 90% of all goods transported globally is done by ship
- Maersk Line represents approx. 4% of worldwide shipping
- 16% of the container segment
- Consumes over 10 M tonnes of heavy fuel oil annually



# Multiple vessels are scheduled on each route to provide regular (weekly) service.



**Transpacific 6 (TP6) - Eastbound**

PORT	ARRIVES	DEPARTS	TRANSIT
Tanjung Pelepas, Malaysia	MON 1900	WED 0300	--
Yantian, Mainland China	FRI 2100	SAT 2200	2
Hong Kong, Mainland China	SUN 0400	MON 0400	4
Los Angeles, CA, USA	FRI 1800	TUE 0200	16

Note: Weekly Service

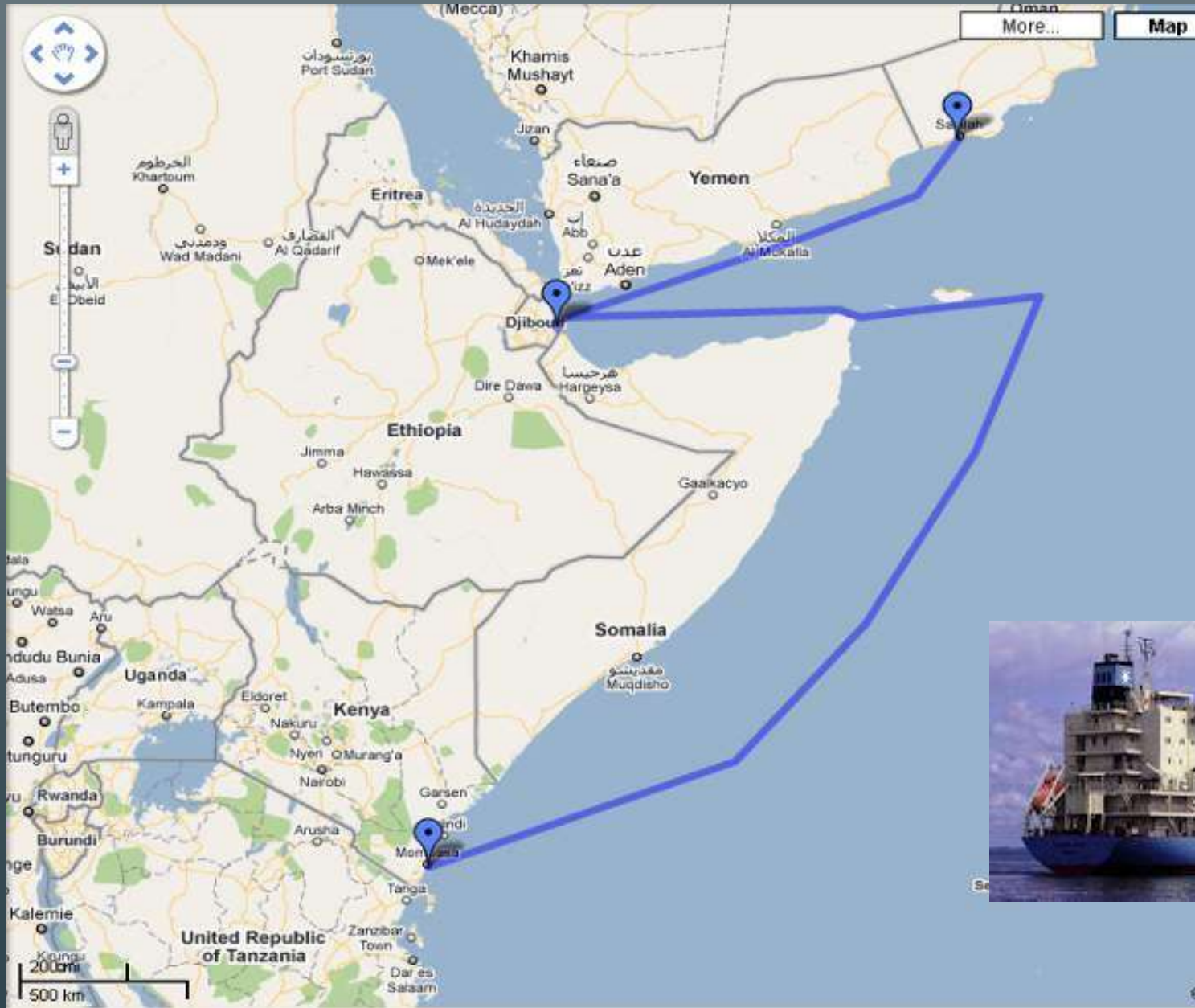


**Transpacific 6 (TP6) - Westbound**

PORT	ARRIVES	DEPARTS	TRANSIT
Los Angeles, CA, USA	FRI 1800	MON 1700	--
Yokohama, Japan	THU 0100	THU 1600	17
Nagoya, Japan	FRI 0800	FRI 1800	18
Shanghai (YS), Mainland China	SUN 1700	MON 0700	20
Ningbo, Mainland China	MON 1900	TUE 0600	21
Xiamen, Mainland China	WED 1300	THU 0001	23
Hong Kong, Mainland China	THU 2000	FRI 0700	24
Yantian, Mainland China	FRI 1200	SAT 0200	25
Tanjung Pelepas, Malaysia	MON 2100	WED 0400	28

# Vessel schedule: Georg Maersk on TP-6

Port Name	Arrival Date	Arrival Time	Departure Date	Departure Time
Hong Kong	18 Apr 2010	04:00	19 Apr 2010	04:00
Los Angeles	30 Apr 2010	18:00	03 May 2010	17:00
Yokohama	20 May 2010	01:00	20 May 2010	16:00
Nagoya	21 May 2010	08:00	21 May 2010	18:00
Shanghai	23 May 2010	17:00	24 May 2010	07:00
Ningbo	24 May 2010	19:00	25 May 2010	06:00
Xiamen	26 May 2010	13:00	27 May 2010	00:01
Hong Kong	27 May 2010	18:00	28 May 2010	11:00
Yantian	28 May 2010	17:00	29 May 2010	07:00
Tanjung Pelepas	01 Jun 2010	09:00	02 Jun 2010	16:00
Jeddah	11 Jun 2010	23:00	12 Jun 2010	23:00
Suez Canal	15 Jun 2010	01:00	15 Jun 2010	17:00
Barcelona	19 Jun 2010	08:00	20 Jun 2010	08:00
Valencia	21 Jun 2010	02:00	22 Jun 2010	08:00
Algeciras	23 Jun 2010	08:00	24 Jun 2010	14:00
Port Tangier Mediterranee	25 Jun 2010	00:01	26 Jun 2010	02:00
Suez Canal	01 Jul 2010	19:00	02 Jul 2010	17:00
Tanjung Pelepas	17 Jul 2010	02:30	18 Jul 2010	10:30
Vung Tau	20 Jul 2010	08:00	21 Jul 2010	08:00
Yantian	23 Jul 2010	15:00	24 Jul 2010	22:00
Hong Kong	25 Jul 2010	04:00	26 Jul 2010	04:00
Los Angeles	08 Aug 2010	18:00	12 Aug 2010	03:00

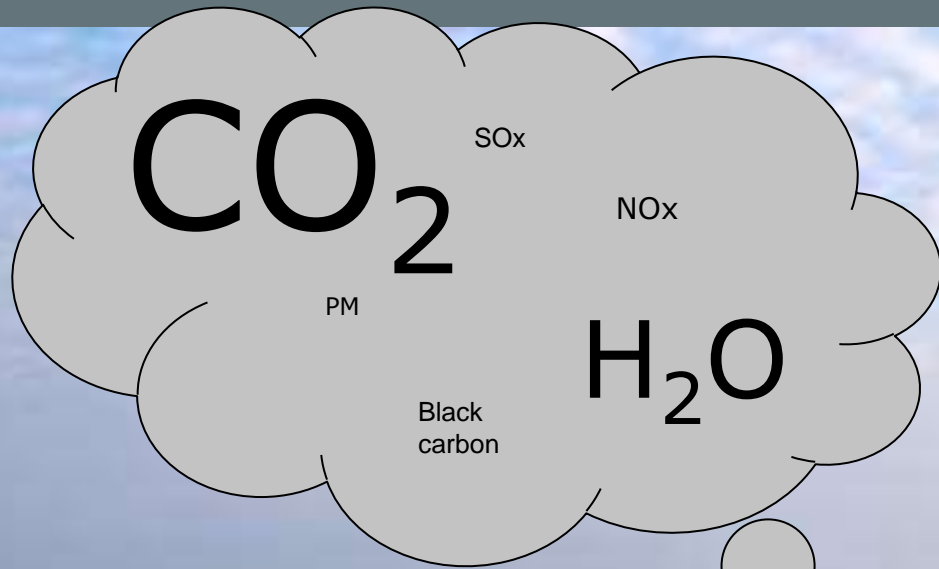


## Maersk Alabama

- US flagged ship
- Operates near Africa delivering US food aid.







**Burning hydrocarbon fuel creates air emissions**





# Transportation does have a significant impact on the environment, but...



... we are doing something about it.



# Fuel switching provides immediate air quality improvement.

## Vessels change fuels:

From Bunker      avg. 2.7% sulfur  
To Distillate      avg. 0.12% sulfur

## Emissions reduction:

SOx:    95%  
PM:    86%  
NOx:    6 to 12%

## Locations:

California – from 24nm  
(1.5/0.5% required since 7/2009)

WA & BC – at dock

Houston – demo 11/09, DERA grant



Mærsk Mc-Kinney Møller stands on the dock at Pier 400 in Los Angeles with the Sine Maersk at berth behind him. The vessel was the first to perform a fuel switch as part of a Maersk Line pilot environmental initiative in California.

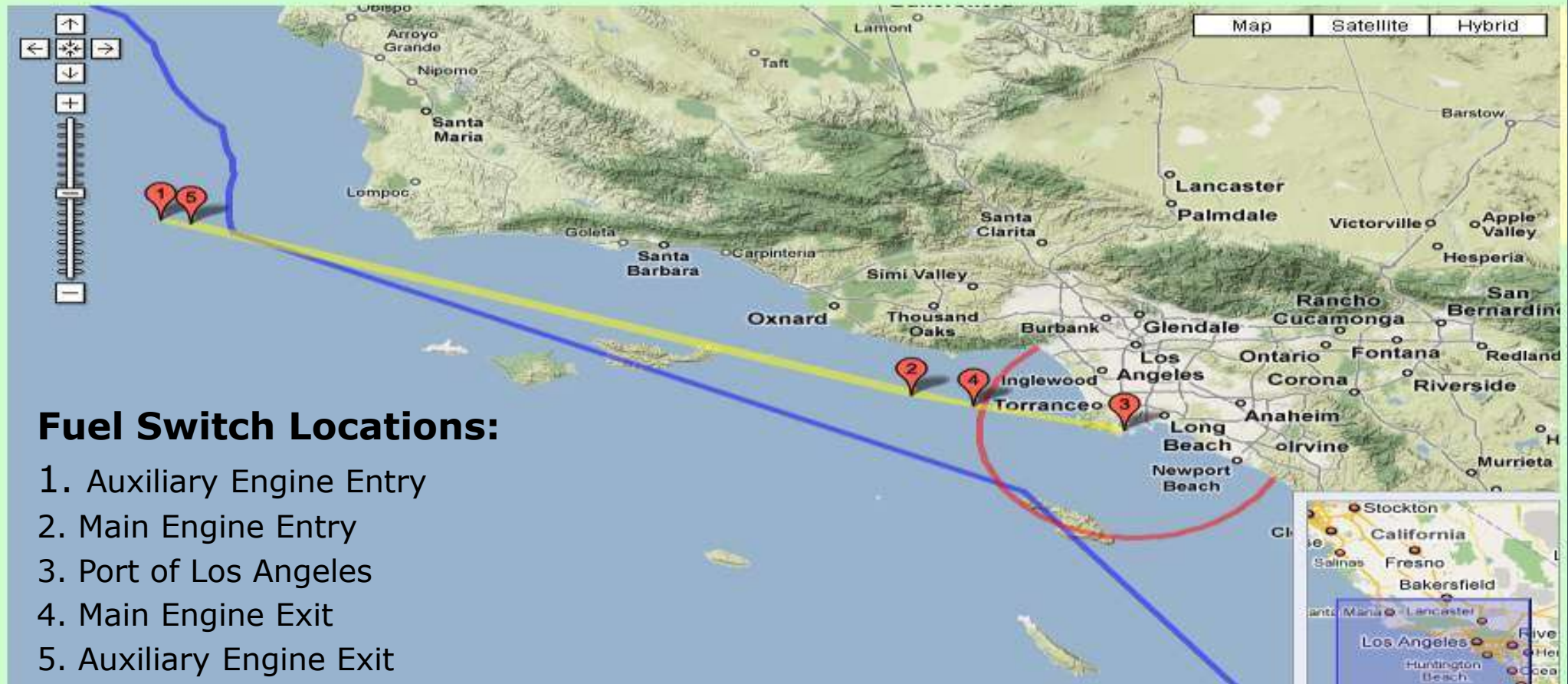
-- March 21, 2006



# Typical Fuel Switch Map

Choose a voyage from the drop-down menu to see fuel switch path: 12/21/2008 - CARSTEN MAERSK - (1506)

## CARSTEN MAERSK - (1506)



### Fuel Switch Locations:

1. Auxiliary Engine Entry
2. Main Engine Entry
3. Port of Los Angeles
4. Main Engine Exit
5. Auxiliary Engine Exit

Data by ENVIRON





# Fuel switch costs and implementation

- Little or no capital investment required – vessel or port
- Mobile solution – travels with the vessel
- Rapid implementation (weeks vs. years)
- Does not shift emissions to other power sources or locations
- Minimal personnel safety or training issue

## BUT:

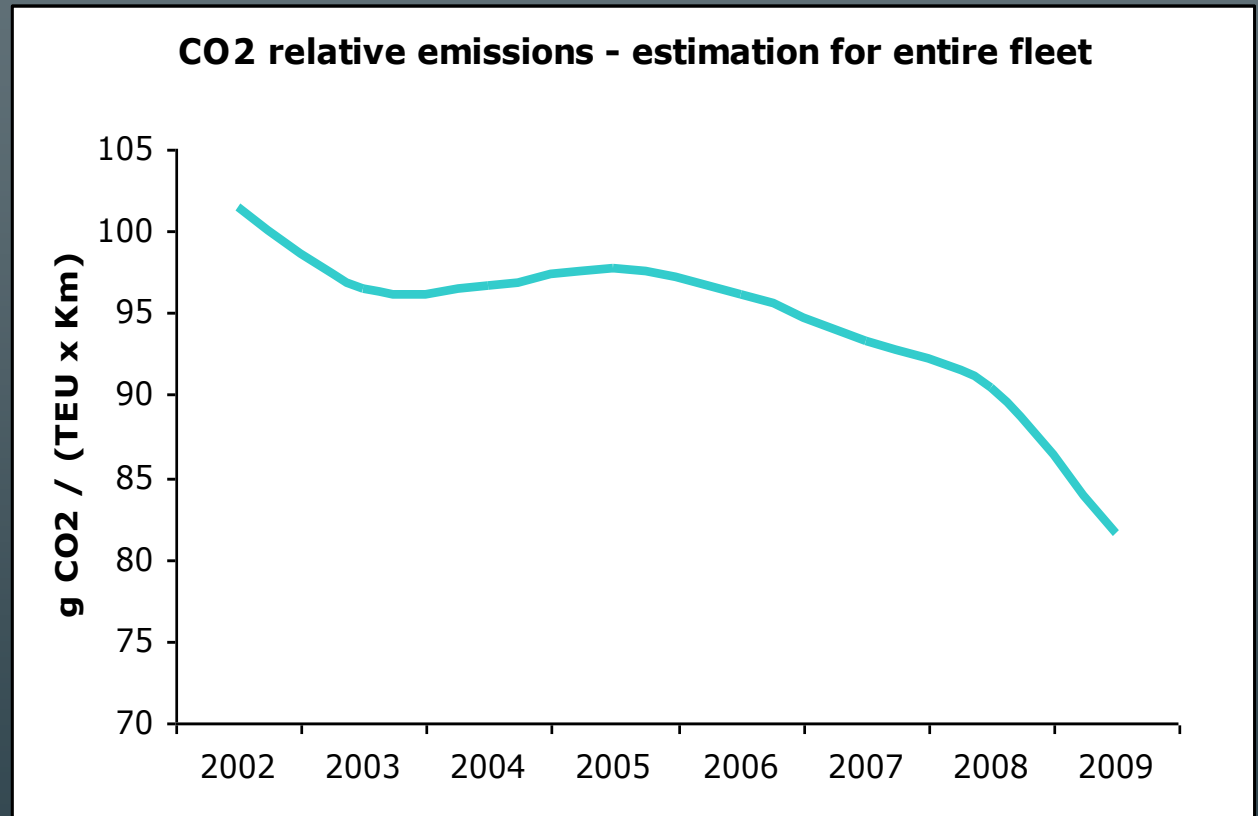
- Fuel cost differential is substantial
- Cost of Program to Maersk to date is over USD 20 million
- Some care needed in switching



# Vessels are becoming more energy efficient, emissions are reduced

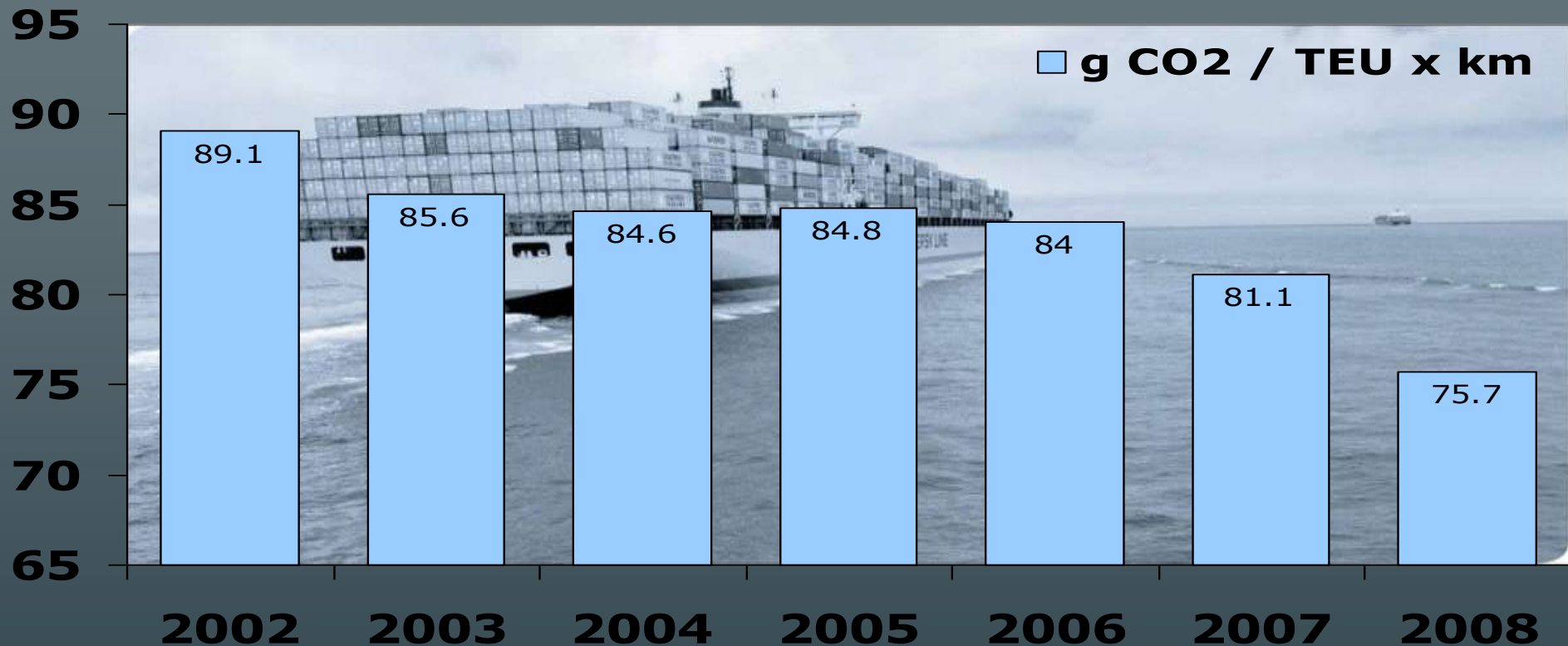
Due to

- Technologies
- Operations
- Speeds
- Vessel size



- Reduced over two million tonnes CO<sub>2</sub> plus other emissions
- Reduction target for 2017 is 20% below 2007 levels

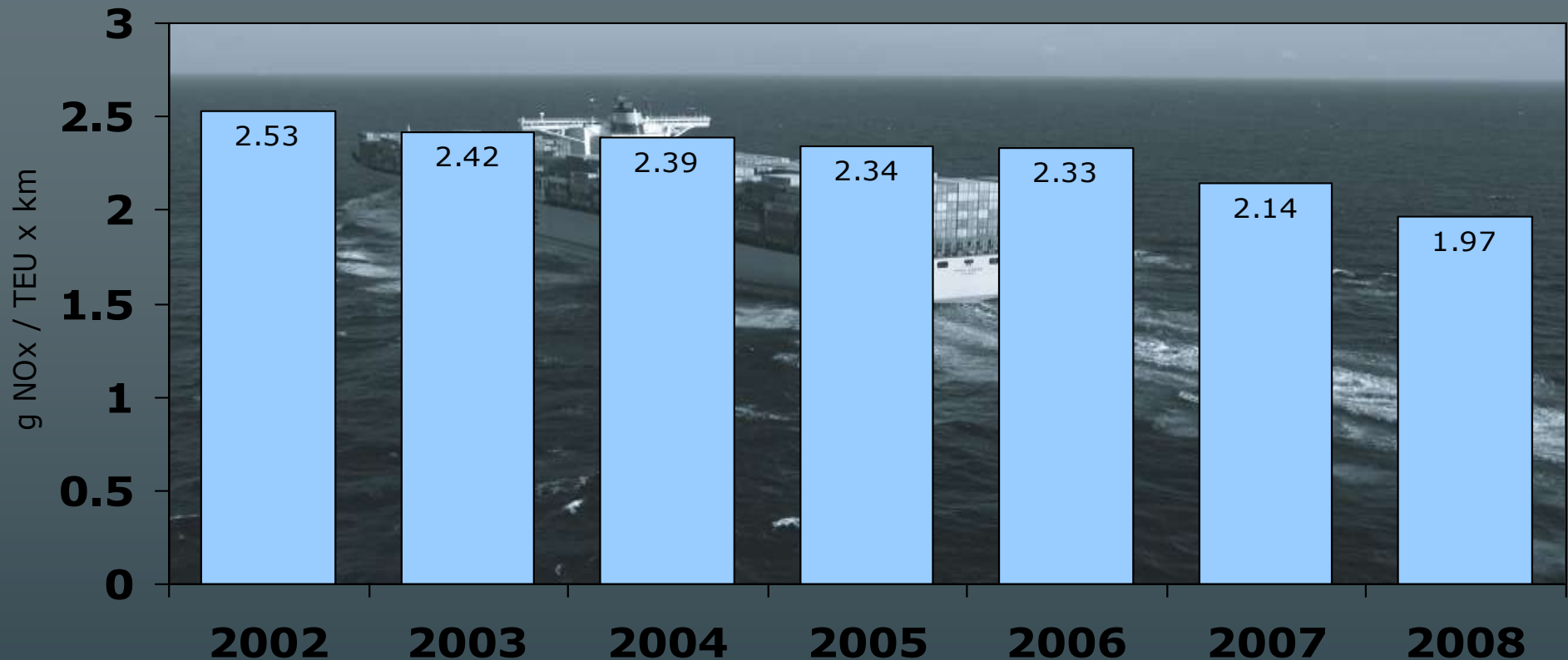
# Maersk-owned container vessels – CO<sub>2</sub> emissions



- 15% decrease in fuel consumption and CO<sub>2</sub> emissions (per TEU x km)
- Reduced over two million tonnes CO<sub>2</sub>
- Reduction target for 2007 – 2017 is 20%

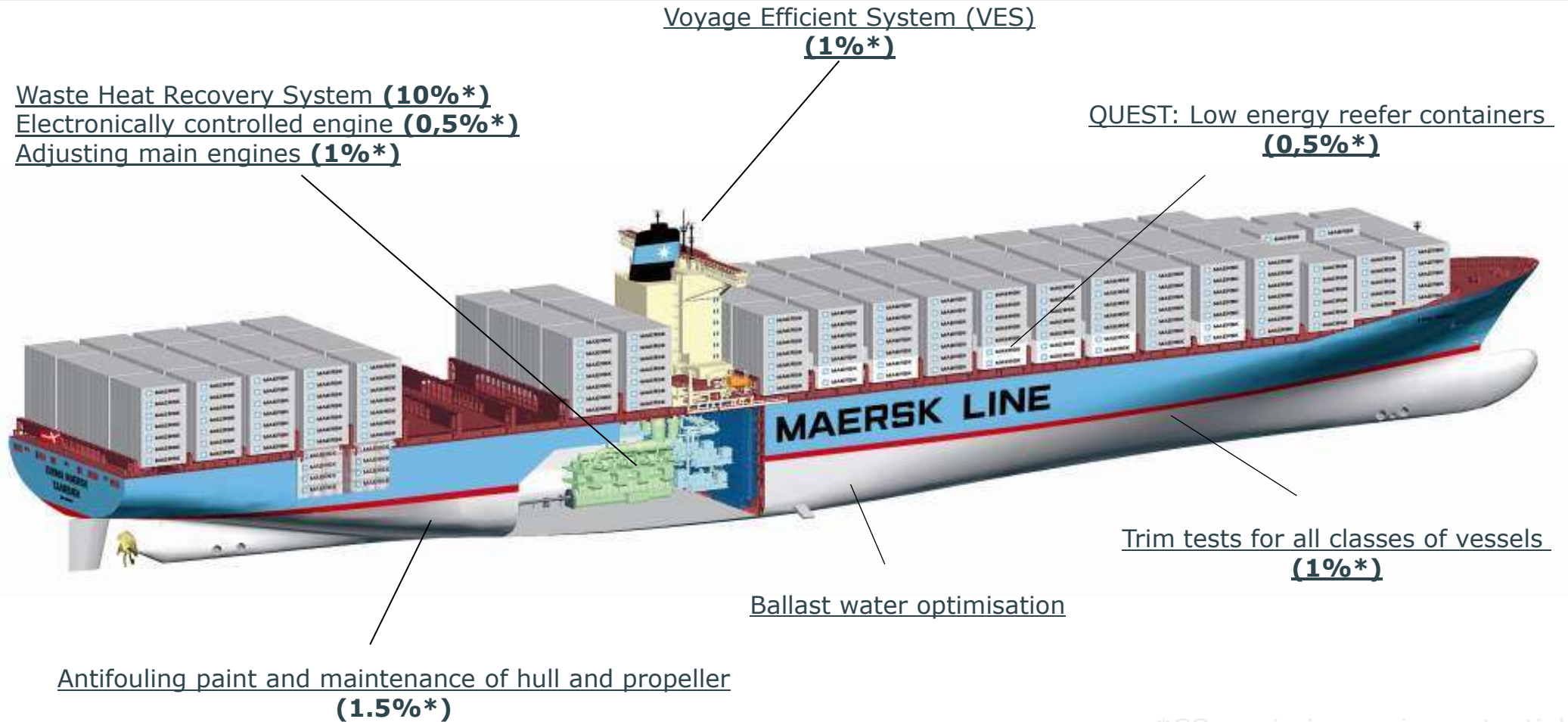


# Maersk Container Vessels -- NOx Emissions



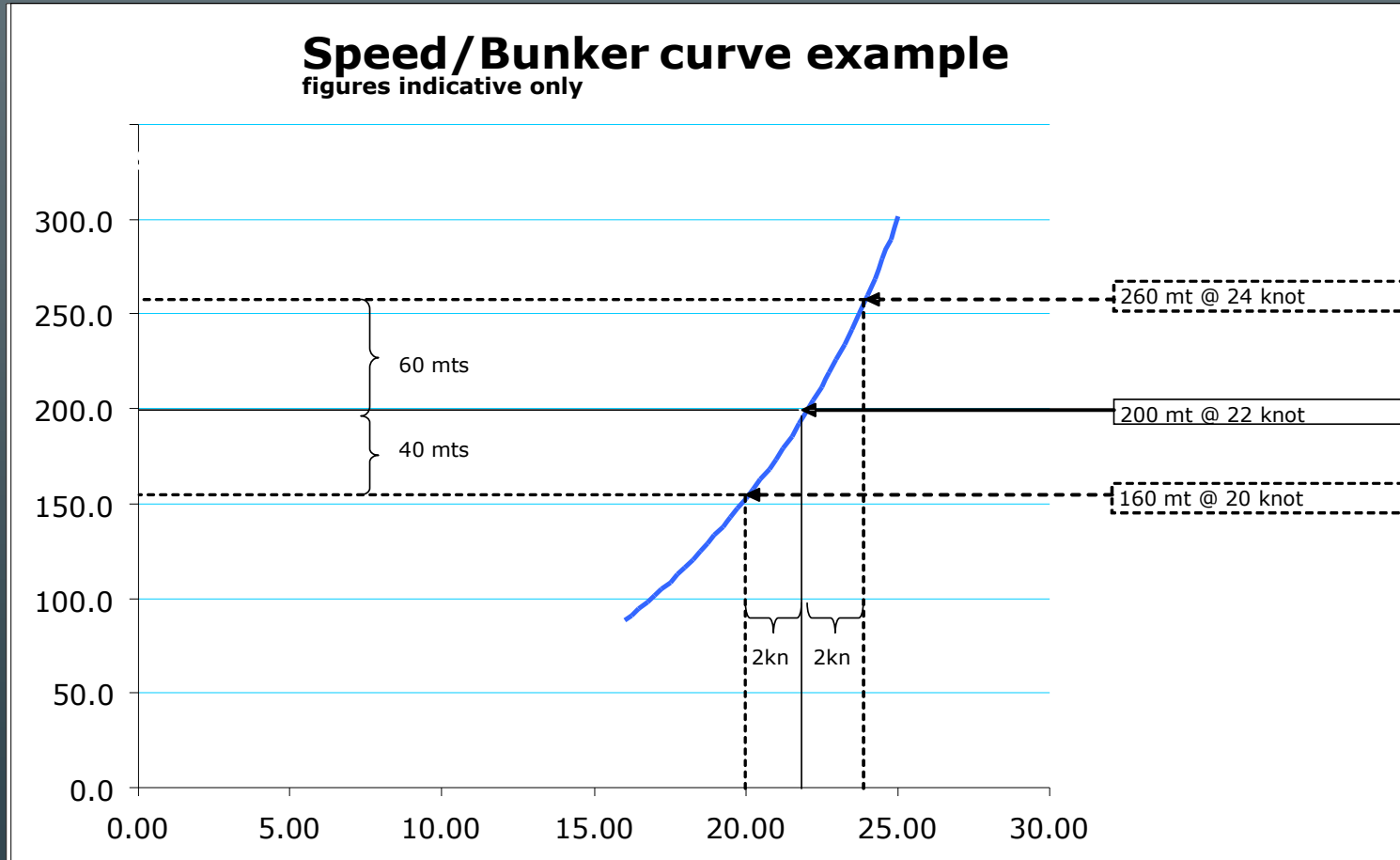
- Decrease in NOx largely due to reduced fuel consumption
- Large and increasing number of vessels built after 2000, so NOx certified

# Technical innovation is essential for sustainability



\*CO<sub>2</sub> emission saving potential

# Fuel use and costs increase exponentially at higher speeds



- The speed/fuel use curve is exponential.
- Speeding up will cost more fuel than what we save by slowing down
- Lowest constant speed is best



# Designing schedules to reduce consumption

8 x 6,000 TEU vessel  
Weekly capacity: 6000 TEU

- To create a weekly schedule:
- 8 vessels means a full rotation time of **56** days



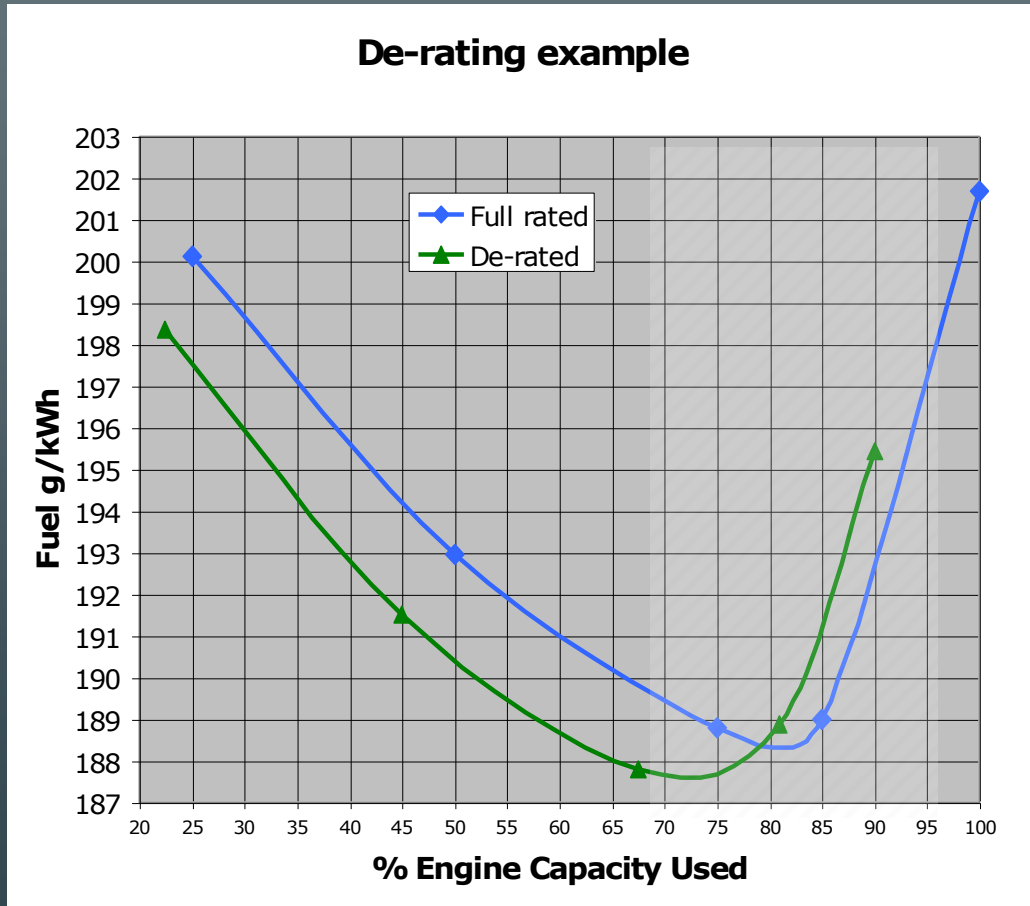
9 x 6,000 TEU vessels  
Weekly capacity: 6000 TEU

- To create a weekly schedule:
- 9 vessels means a full rotation time of **63** days



# Adjusting main engines to economical speed

- Traditionally, vessels are optimized for high speed
- Lower economical speed allows for de-rating of the main engine
- Maximum engine power is restricted
- Significantly lower fuel consumption at medium power



# Super Slow Steaming Initiative

- **Study started in 2007, covered 110 vessels**
  - **Maersk collaborated with engine manufacturers**
- **Results:**
  - **OK to operate as low as 10% engine load**
  - **Traditional range is 40 – 60%**
  - **Manufacturers have changed recommendations**
- **Over 100 vessels used since 2007, resulting in**
  - **More flexible voyage & schedule planning**
  - **10 – 30% fuel savings and reduced CO<sub>2</sub>**
  - **Significant savings:**
    - **Post panamax: 3500 MT fuel, 10,000 MT CO<sub>2</sub>**
    - **\$1 million**
- **Sustainable Shipping Operator of The Year - 2009**







# Working with the industry and customers to reduce impacts

- Clean Cargo Working Group is a business-to-business forum with the goal “to promote more sustainable product transportation”
- Members are shippers and ocean liner companies including:
  - American Eagle Outfitters, Chiquita, Coca-Cola, IKEA, Johnson & Johnson, John Wiley & Sons, NIKE, Nordstrom, Phillips-Van Heusen, Polo Ralph Lauren, Starbucks, Wal-Mart
  - APL, CMA CGM, COSCON, Hamburg Sud, Hanjin, Hapag Lloyd, Hyundai, K Line, Li & Fung, Maersk Line, NYK Line, OOCL, Safmarine, Shell Marine, UPS, Yang Ming

# Clean Cargo Working Group Environmental Performance Scorecard

Carrier Name:

TABLE 1 - OVERALL PERFORMANCE

	% of Fleet Reported On		Max Score Possible	Carrier Score	Carrier Score as % of Max
	Owned	Time-Chartered			
CO2 Emissions (across all trade lanes)	--	--	50	N/A	N/A
SOx Emissions	--	--	15	--	--
NOx Emissions	--	--	15	--	--
Environmental management systems	--	--	10	--	--
Transparency	--	--	10	--	--
<b>Overall Performance</b>			100	N/A	N/A

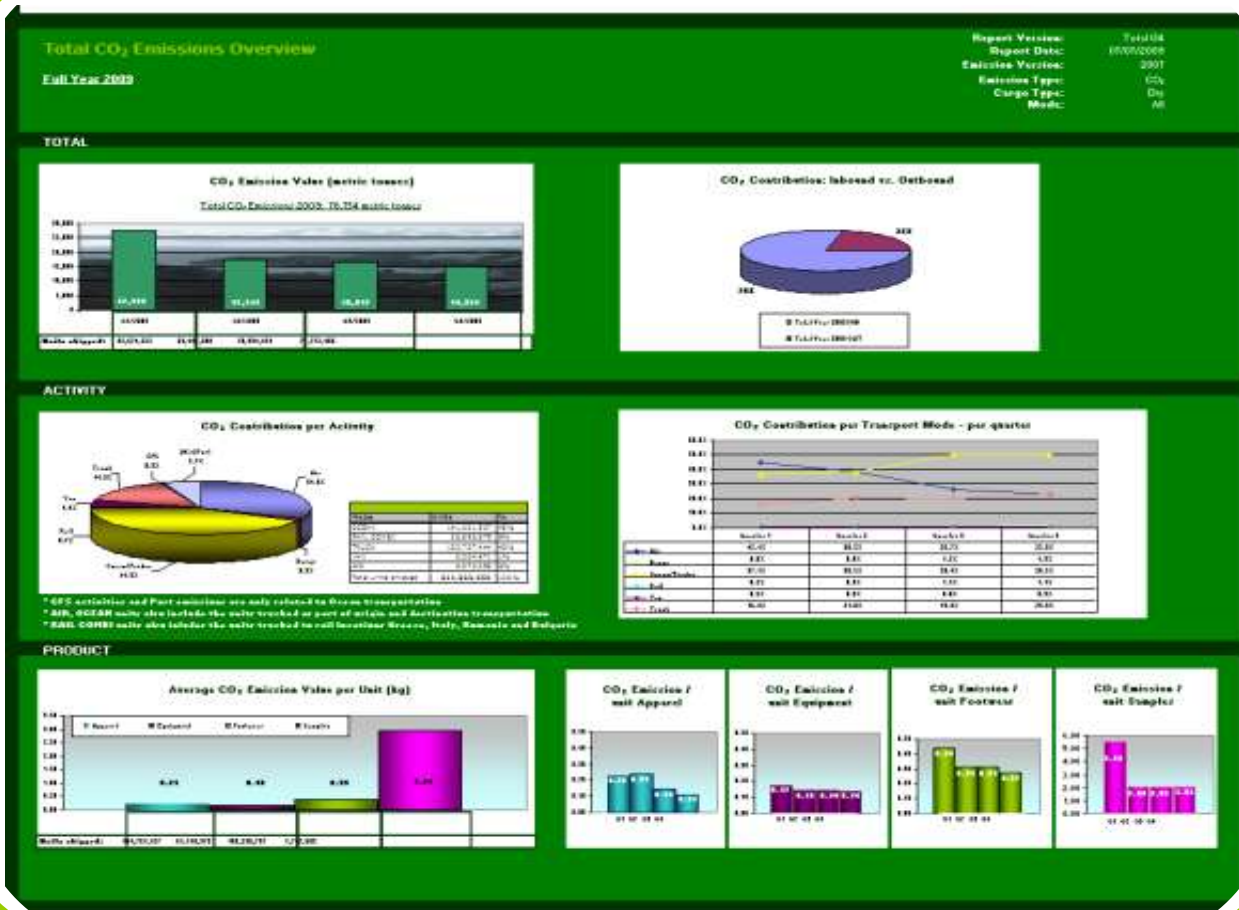
\*Score not available until "CCW"

TABLE 2 - DETAILED CO2 PERFORMANCE

CO2 Emissions - by trade Lane	% of Fleet Reported On		TEU-km	DRY CONTAINERS		REEFERS	
	Owned	Time-Chartered		grams CO2/	Score	grams CO2/	Score
				TEU-km		TEU-km	
Asia--Africa	--	--	-	-	N/A	-	N/A
Asia--South America (EC/WC)	--	--	-	-	N/A	-	N/A
Asia--Oceania	--	--	-	-	N/A	-	N/A
Asia--North Europe	--	--	-	-	N/A	-	N/A
Asia--Mediterranean	--	--	-	-	N/A	-	N/A
Asia--North America EC	--	--	-	-	N/A	-	N/A
Asia--North America WC	--	--	-	-	N/A	-	N/A

# Case study: Nike

Visibility on supply chain carbon emissions to help accomplish 30% reduction target for 2020



# Greener can also be cheaper

Case studies at [www.damco.com](http://www.damco.com)

CarbonCheck projects with Boots, a leading international chain of pharmacy and health and beauty stores.

Since 2004, focus on these analyses have enabled Boots to

- **reduce CO2 emissions by 29% and**
- **reduce logistics costs by 21%**

in their inbound supply chain from Asia to their distribution centre in England.

”It goes to show that if you review and optimize your supply chain end-to-end from a green perspective, great savings can be made.”

-- Erling Johns Nielsen  
Supply Chain Development Team  
Maersk Logistics



# Thank you

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