

# Delivering Sustainability

West Coast Collaborative Partners Meeting – 5/31/2012

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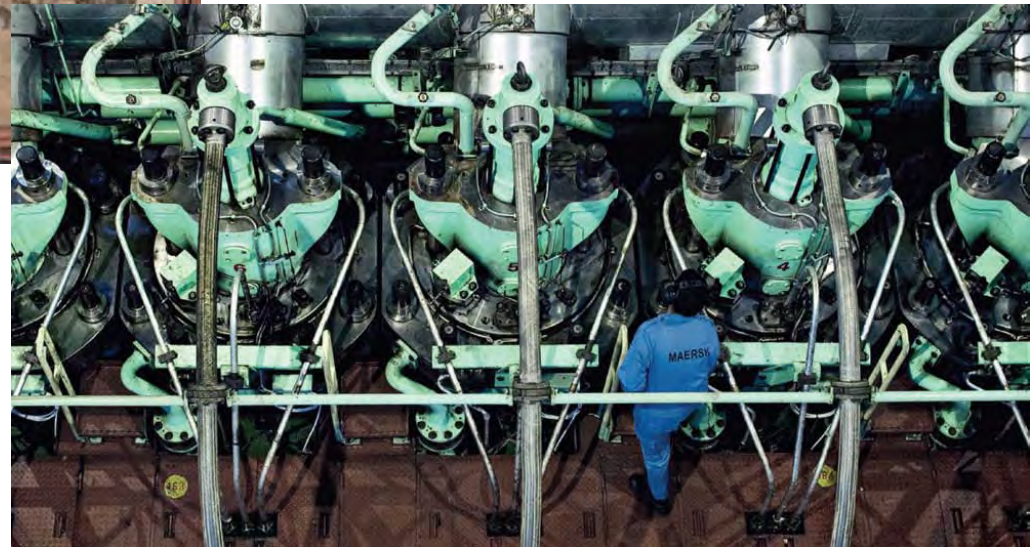


Today, a single ship can deliver thousands of tons of cargo for many customers to dozens of ports. But it was not always this way ...





# Diesel engines have replaced wind power



# Containers have replaced “break bulk” cargo handling



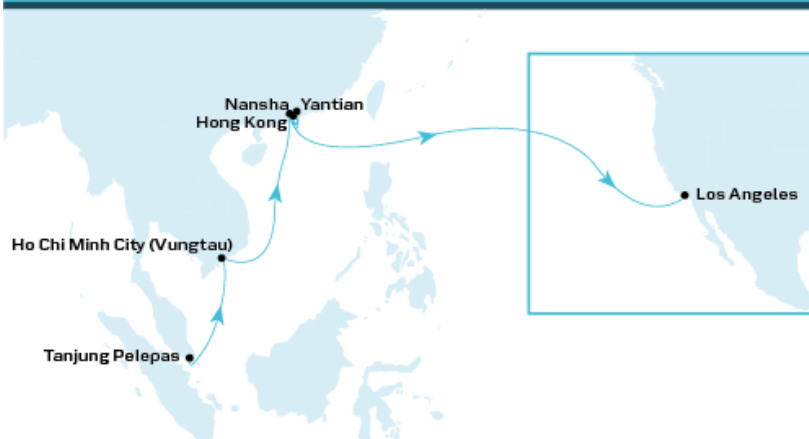
# Containers are standard sizes: 20', 40' or 45'

- A 40-foot container is the size of a city bus
  - Can hold:
    - 1,500 DVD players
    - 18,000 T-shirts
    - 90,000 lamb chops (what a four-person family would eat in 450 years)
- 45-foot container can hold 28,000 Barbie Dolls



Vessels routes require several weeks.  
*Multiple vessels are scheduled on each route to provide regular (weekly) service.*

### Transpacific 6 (TP6) - Eastbound



Port	Arrives	Departs	Transit
Tanjung Pelepas, Malaysia	FRI	SUN	-
Ho Chi Minh City (Vungtau), Vietnam	TUE	TUE	2
Nansha, Mainland China	FRI	SAT	5
Yantian, Mainland China	SAT	SUN	6
Hong Kong, Hong Kong	SUN	MON	7
Los Angeles, CA, USA	SUN	THU	21

### Transpacific 6 (TP6) - Westbound



Port	Arrives	Departs	Transit
Los Angeles, CA, USA	SUN	THU	--
Ningbo, Mainland China	WED	THU	19
Shanghai (YS), Mainland China	FRI	SAT	20
Xiamen, Mainland China	MON	MON	23
Yantian, Mainland China	TUE	WED	26
Tanjung Pelepas, Malaysia	SAT	MON	30



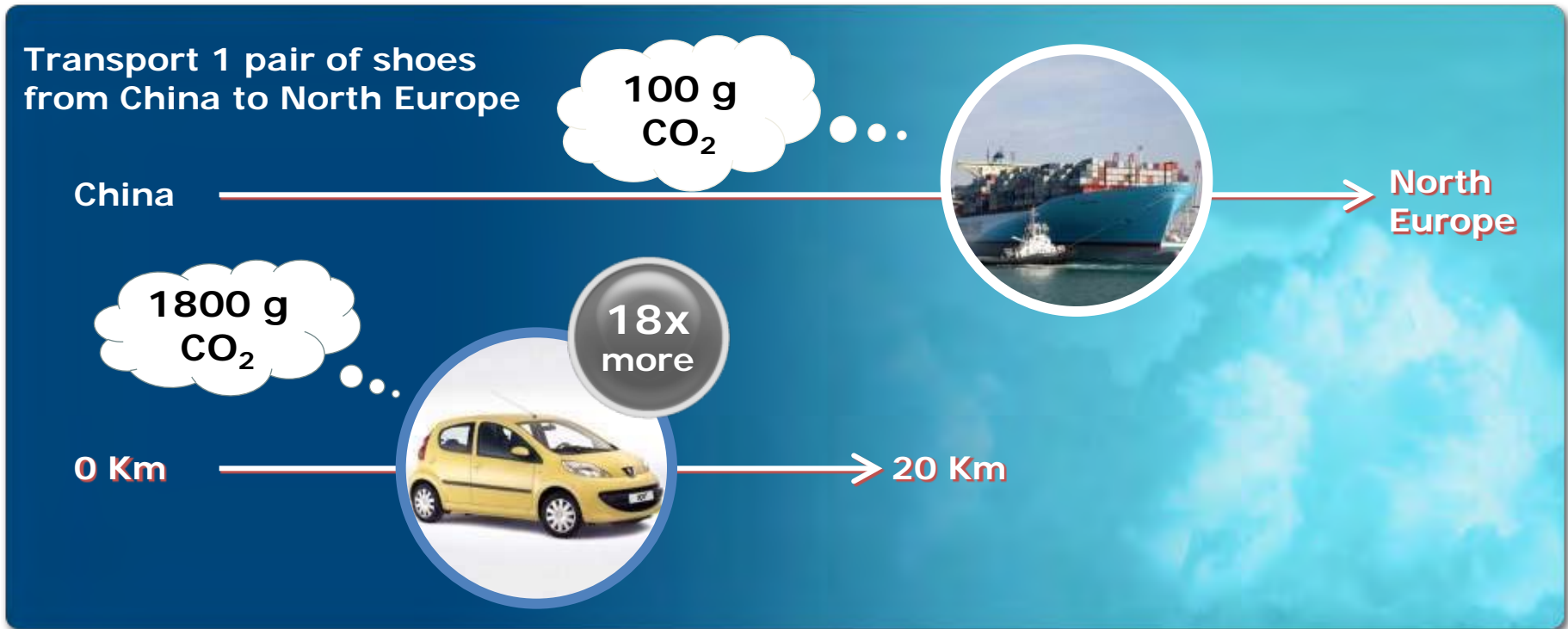
# A 14 week round trip requires 14 vessels.

*Sample Vessel Schedule: Georg Maersk on TP-6 in 2010*

Port Name	Arrival Date		Departure Date	
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

14 week  
round  
trip

# Ocean shipping is the most energy-efficient mode of transportation

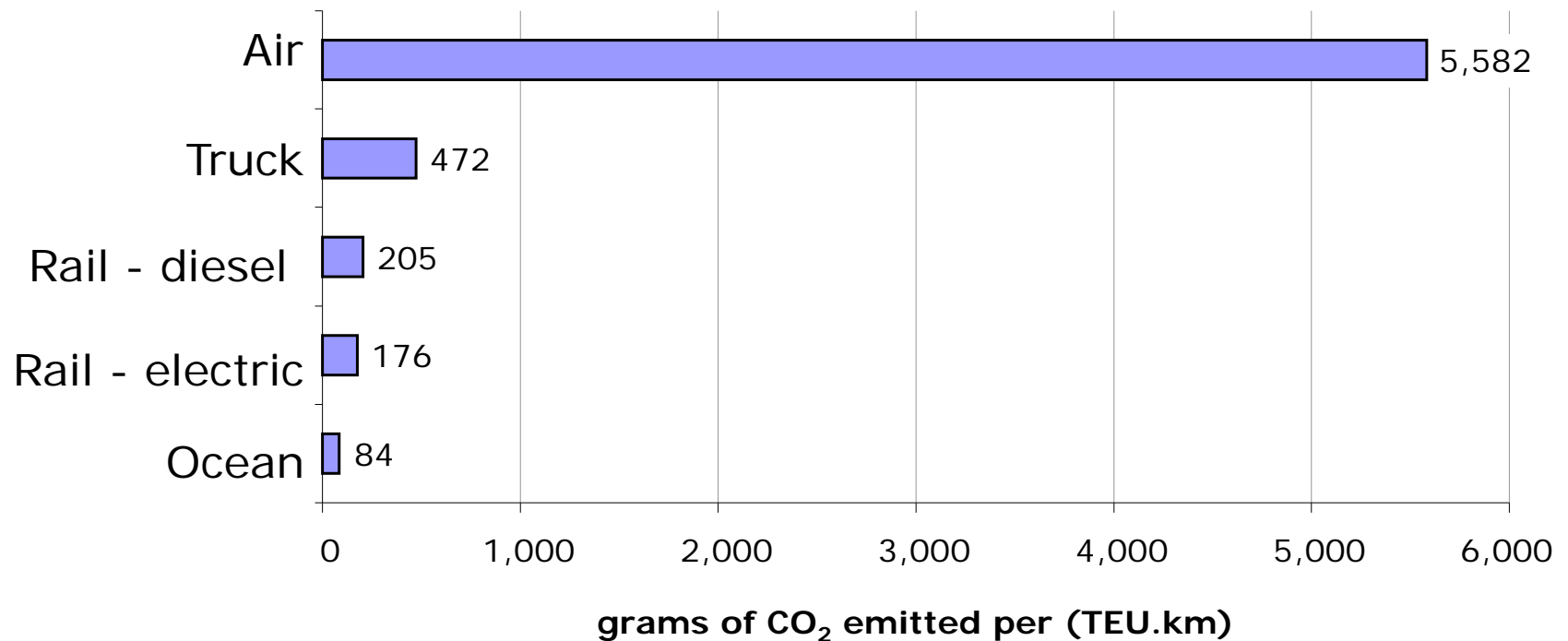


Shipping emits <4% of the world's CO<sub>2</sub> emissions while transporting 90% of the world's goods



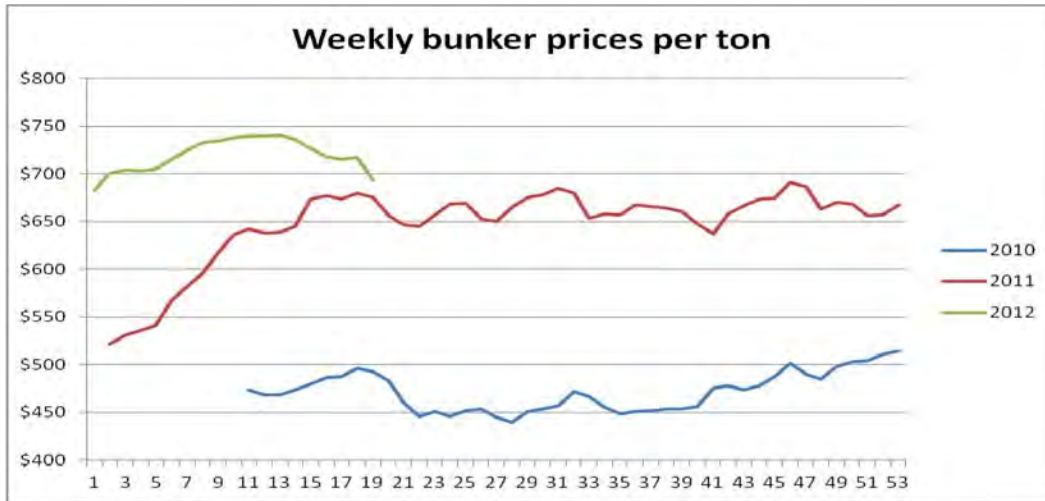
# Ocean shipping has the lowest environmental impact for long distance transportation.

## CO<sub>2</sub> Emissions by Mode of Transportation

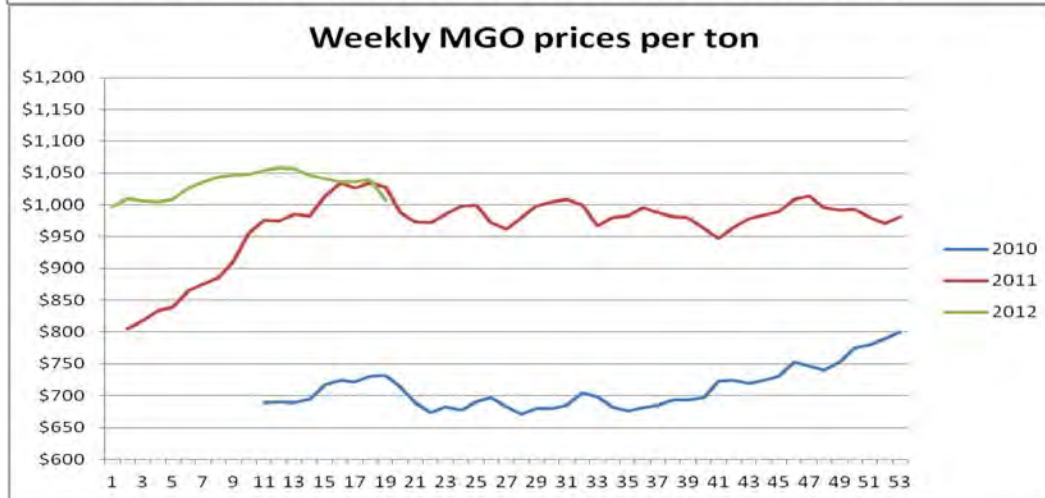


**90% of all goods transported globally are carried by ship.**

# Vessel fuel costs have soared since 2010.



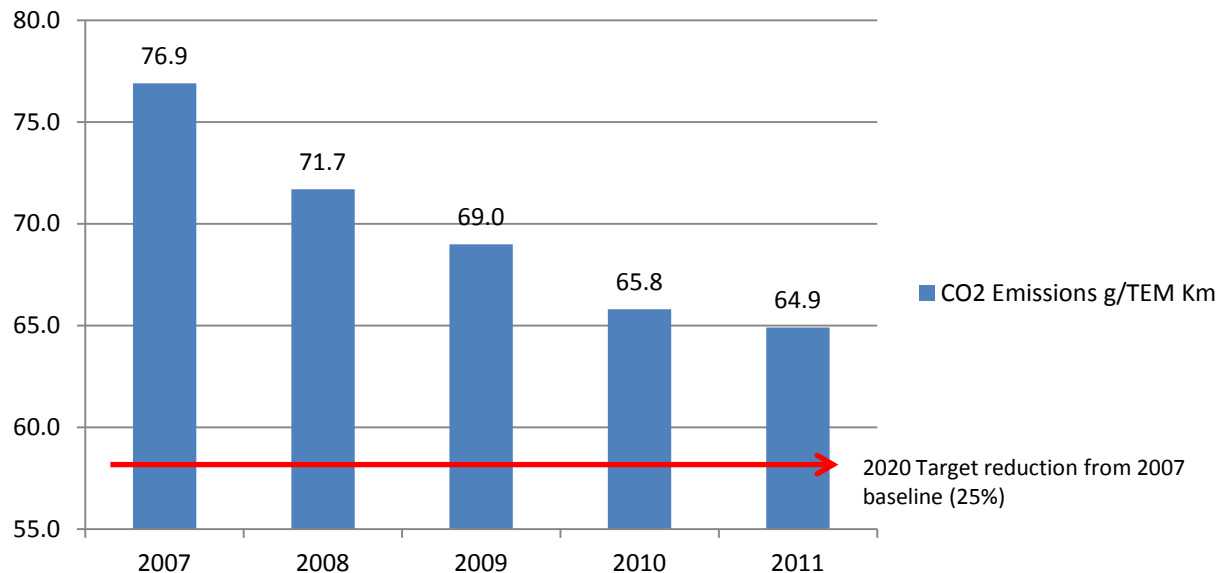
**Bunker fuel (\$/metric ton)**  
**2010**     \$440 - 520  
**2012**     \$680 - 740



**Marine Gas Oil (\$/metric ton)**  
**2010**     \$ 670 - 800  
**2012**     \$1000 - 1060

Vessels are becoming more fuel efficient.  
*This reduces fuel use and air emissions.*

Maersk Line CO2 Reductions



- 15.6% per TEU km since 2007
- Due to vessel size, technologies, operations
- Reduction target for 2020 is 25%

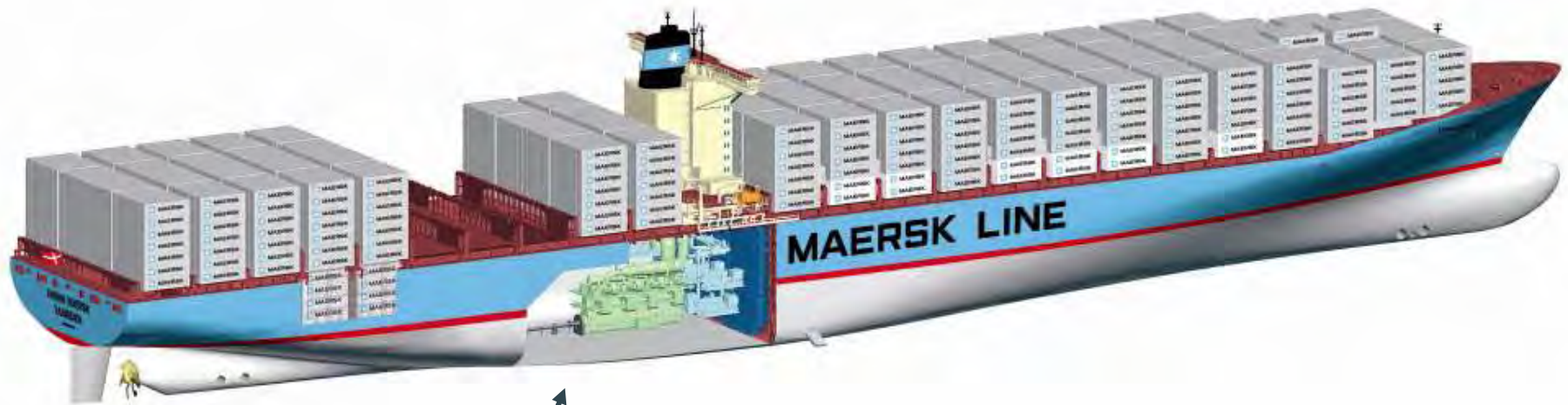
Verified by:

Lloyd's  
Register

250 YEARS  
OF SERVICE



# Innovation is essential for sustainability



- *Propeller, hull & trim optimization*
- *Waste heat recovery system*
- *Slow steaming and super-slow steaming*

## Other Initiatives

- *Alternative fuel tests*
- *New propulsion technologies*
- *ISO 14001 certified*
- *Crew awareness and engagement*
- *Maintenance of hull and propeller*
- *Voyage Efficiency System (VES)*
- *Trim optimization*
- *SOx scrubber studies*
- *Antifouling hull paint*
- *QUEST: Low energy chilled containers*
- *Modified bulbous bow*
- *Micro bubbles*
- *Ballast water optimization and treatment systems*

New vessels are increasingly energy efficient.  
*Vessels being delivered today are 28 to 50% better.*

### **“Triple E” – 18,000 TEU**

- Announced 2011
- Delivery in 2013 - 2014
- 50% more efficient than 2010 industry average for Asia-Europe.



### **WAFMAX class – 4500 TEU**

- 28% less CO2 per TEU
- 22 vessels delivered 2011-2012
- 12 more delivered by 2012



### **SAMMAX class – 7500 TEU**

- 50% less CO2 per TEU
- 16 vessels delivered 2011-2012



# Vessel environmental improvements take time and partnerships.

## New vessels

- Optimize vessels for intended services
- Potential energy efficiency improvements 20-50%
- Work with shipyards, equipment and fuel suppliers
- Long-term view plus short-term impact

## Personnel

- Vessel crews
- Shore side teams
- Structures, metrics, idea sharing

## Existing fleet

- Identify or develop technologies
- Work with Charter vessel owners
- Partner with technology, software and engine suppliers
- Identify the right mix for each vessel





# Six years of using cleaner vessel fuel in the US & Canada reduced toxic air emissions in ports.

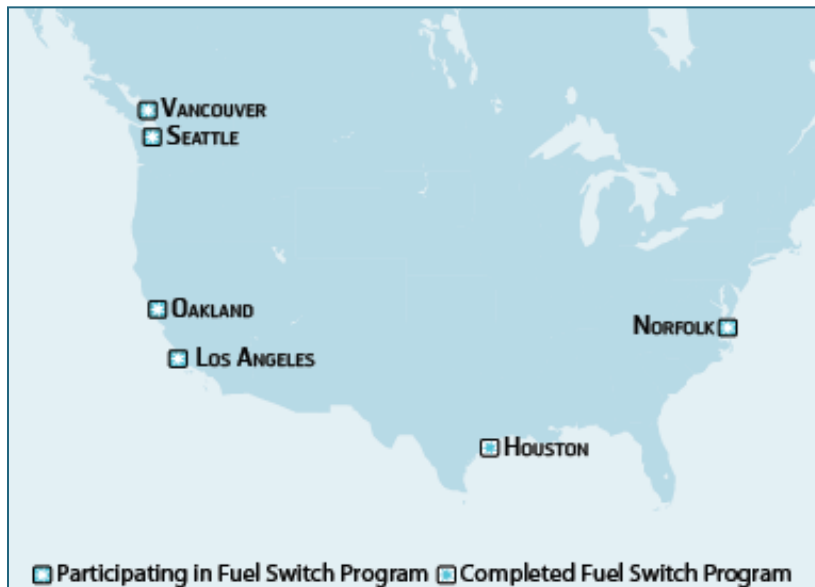
## US & Canada:

- 2476 port calls from 3/2006 to 4/2012.
- Reduced over 4700 MT of emissions:

SOx	95%
Particles (PM)	86%
NOx	6-10%



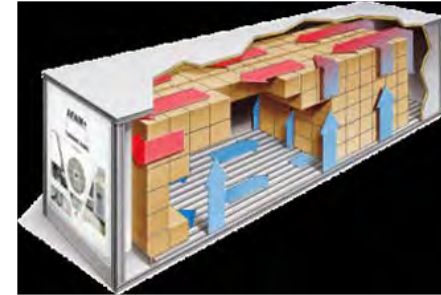
First port call with cleaner fuel: Maersk McKinney Moller and Sine Maersk in LA 3/31/2006.



- Now a global Maersk initiative
  - Hong Kong 9/2010
  - Singapore 7/2011
  - Gothenburg Sweden 1/2012

# Improvements go beyond the vessels

- Reefers – a new, innovative control system reduces energy consumption by 50% (some >63%) in all parts of the supply chain.
- Dry Containers - flooring is now recycled plastic, bamboo or FSC certified timber.
- Slow or “steady” steaming – voyage efficiency systems improve on-time delivery while minimizing fuel usage.
- Testing alternative fuels and propulsion.
- Using our vessels to assist ocean scientists.

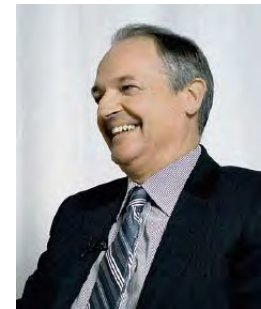
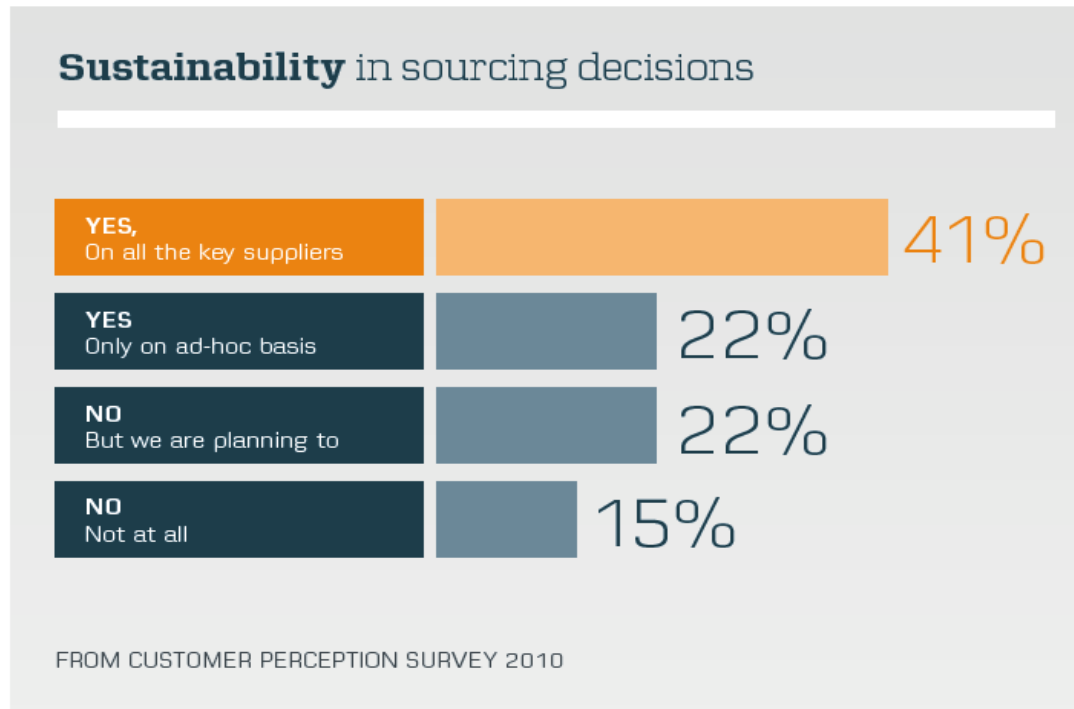


Study Period	On-time %	Ranking Among Top 20
3Q11	83	1
2Q11	76	1
1Q11	66	3
4Q10	70	1
3Q10	79	1
2Q10	77	1
1Q10	69	1
4Q09	63	1
3Q09	71	2
2Q09	79	1
1Q09	78	1
4Q08	77	1
3Q08	68	1
2Q08	76	1

# Our customers are demanding more sustainable supply chains.

The feedback of more than 300 of our customers:

41%: *"Yes we consider sustainability in our sourcing decisions"*



CEO letter to Maersk Line

*"To realise our vision, we must address our impact right across the value chain. We will need to work closely with our suppliers, consumers and many other stakeholders"*

- Paul Polman  
CEO, Unilever





# Industry Efforts to Measure and Reduce Environmental Impacts

[www.bsr.org](http://www.bsr.org)

Clean Cargo Working Group is a business-to-business forum with the goal “to promote more sustainable product transportation.”

## CCWG’s membership (2010)

Carriers		Shippers	
Hapag-Lloyd	MAERSK	WAL*MART®	NIKE
HANJIN SHIPPING		NORDSTROM	IKEA
HAMBURG SÜD	NYK LINE	Coca-Cola	STARBUCKS COFFEE
K LINE®	YANG MING GROUP	Electrolux	
HMM	CMA CGM	Johnson & Johnson	Shell
MOL	OOCL	AMERICAN EAGLE	PVH
APL	CSAV	POLO RALPH LAUREN	
	DAMCO		
BSR	NVOCCs	DHL	KUEHNE+NAGEL

- Standardized footprint calculation tools
- Annual environmental performance survey and benchmarking
- Working to harmonize environmental calculations globally
- Emissions factors published by trade lane.

# These factors allow us to compare routes for CO<sub>2</sub> emissions.

*Example: Central America to Atlanta GA*

Route	Data source	From	To	Distance (km)	Emission Factor	Emissions Factor Units	Kilograms of CO <sub>2</sub> per FFE
<b>Port -- Miami</b>							
Ocean - Industry average	CCWG 2009 Intra-Americas Industry Average	Santo Tomas	Miami	1533	102.28	g CO <sub>2</sub> /TEU/Km	314
Truck	SmartWay default factor	Miami	Atlanta	1041	1148	g CO <sub>2</sub> /km	1195
<b>Total</b>				<b>2575</b>			<b>1509</b>
<b>Port -- Savannah</b>							
Ocean - Maersk Line Intra-America average	2010 Maersk Line CCWG factor (verified)	Santo Tomas	Savannah	2228	100.3	g CO <sub>2</sub> /TEU/Km	447
Truck	SmartWay	Savannah	Atlanta	373	1148	g CO <sub>2</sub> /km	429
<b>Total</b>				<b>2601</b>			<b>876</b>
		<b>per FFE CO<sub>2</sub> Savings</b>					<b>633</b>
		<b>Carbon Footprint Reduction</b>					<b>42%</b>

Note 1. Clean Cargo Working Group report "Beyond the Factory Gates: How Brands Improve Supply Chain Sustainability Through Shipping and Logistics" page 6, 2009 data, [http://www.bsr.org/reports/CCWG\\_Report\\_Mar\\_2011\\_FINAL.pdf](http://www.bsr.org/reports/CCWG_Report_Mar_2011_FINAL.pdf)

# Changing the way we think about shipping:

- **It isn't only the biggest ships -- it's the right ships.** This means optimizing the ships for the service, and upgrading the whole portfolio -- new, existing and charter.
- **"Steady Steaming"** delivers more environmental benefits than just slow steaming.
- **Reliability / On-time delivery** benefits the customer and can also benefit the environment.
- Leading in **transparency** -- publishing every vessel's performance using global standard methods, and third-party verification.
- Sustainability is the right thing to do and also **makes good business sense.**

Thank you

