



Container Shipping and Supply Chains

Lee Kindberg
Marine Board
May 24, 2018

We are a diverse shipping company



TRANSPORT & LOGISTICS

SØREN SKOU, CEO, Transport & Logistics



*The Maersk Line brand includes Safmarine, Seago Line, SeaLand, Mercosul Line and MCC Transport

Significant investment in digitisation


Maersk Container Industry and Maersk Line to join forces in optimising container production planning, and developing new technology

APM Terminals is to focus on the implementation of the new terminals currently under construction and win new profitable third party business

Maersk Line is to grow its market share organically on a consistent basis

Svitzer is to pursue opportunities in collaboration with APM Terminals and Maersk Line

Damco is to collaborate more closely with Maersk Line in driving sales leads and volume to one another



SHIPPING
ENABLES TRADE
AND AFFECTS
THE LIVES OF
BILLIONS

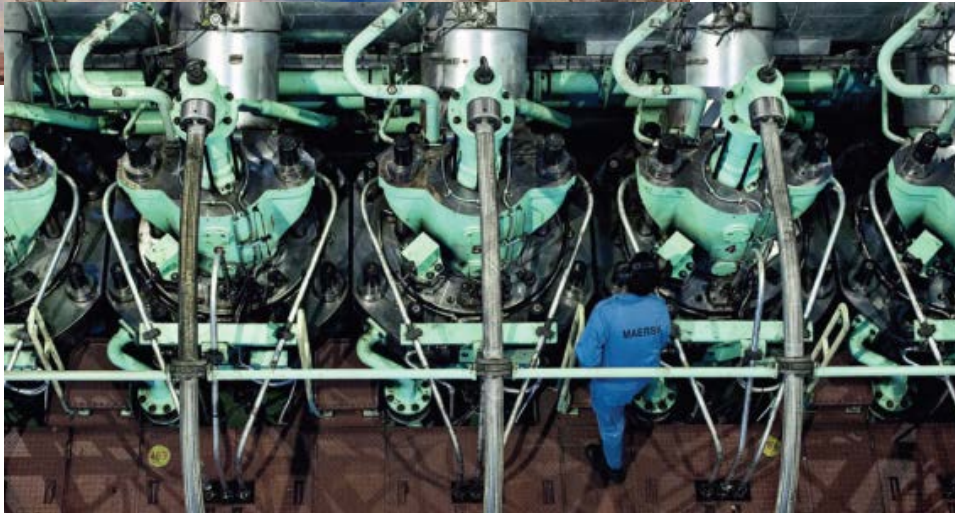
90%
of internationally
traded goods are
transported by sea

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', 45'

A 40-foot container is the size of a city bus. It can hold . . .



One million Legos



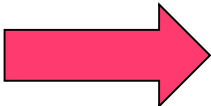
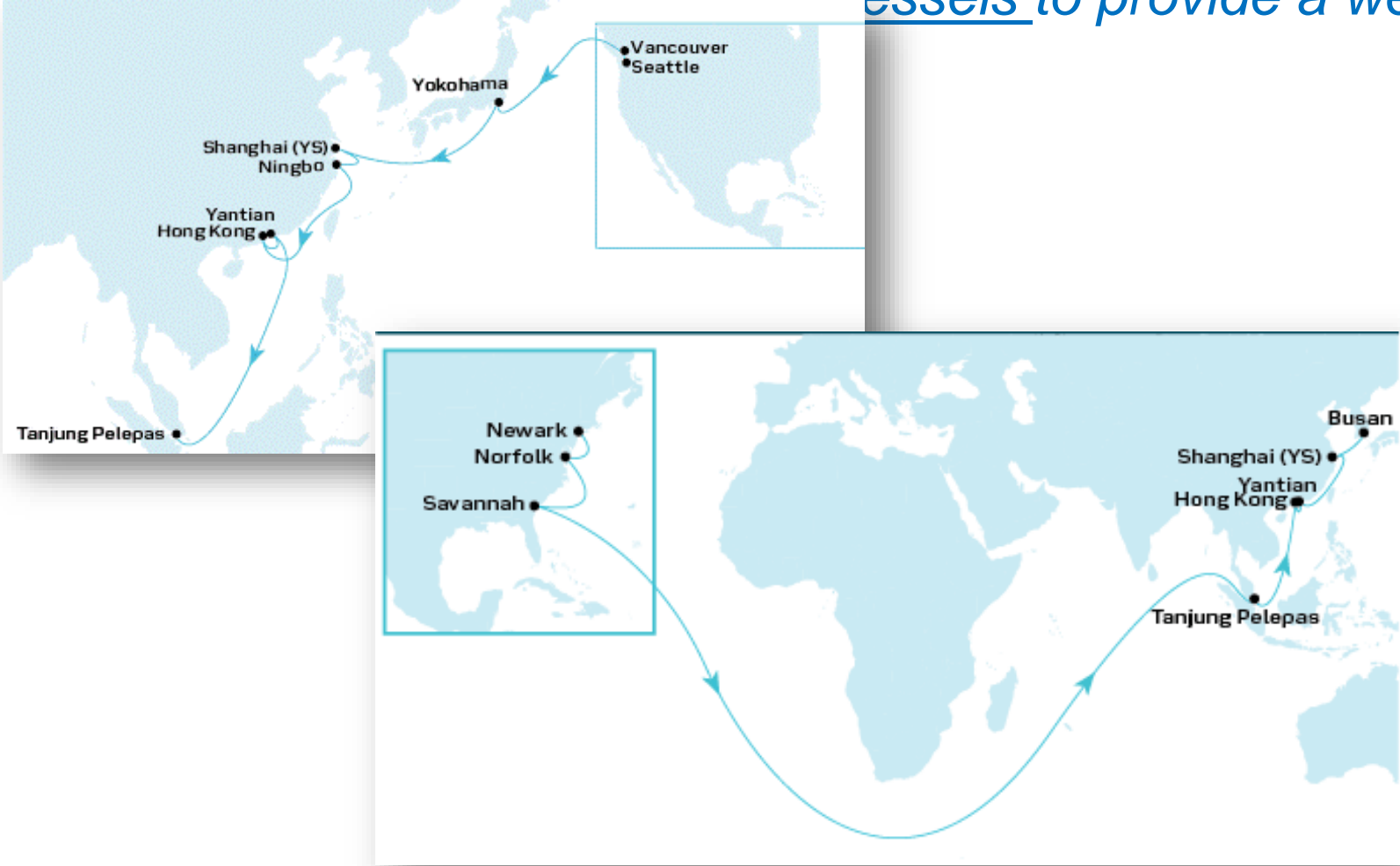
10,000 Nike Shoes



1,500 DVD Players

Liner shipping means strict routes and schedules.

A 16 week round trip requires 16 vessels to provide a weekly



Axel Maersk Arrival	⁸ City
01-05 -2014	Vancouver
01-08	Seattle
01-20	Yokohama
01-23	Shanghai
01-24	Ningbo
01-27	Hong Kong
01-28	Yantian
02-01	Tanjung Pelepas
02-12	Suez Canal
02-24	Newark
02-27	Norfolk
03-01	Savannah
03-18	Suez Canal
04-01	Tanjung Pelepas
04-07	Hong Kong
04-08	Yantian
04-11	Shanghai
04-14	Busan
04-24	Seattle
04-27	Vancouver



Ocean Alliance



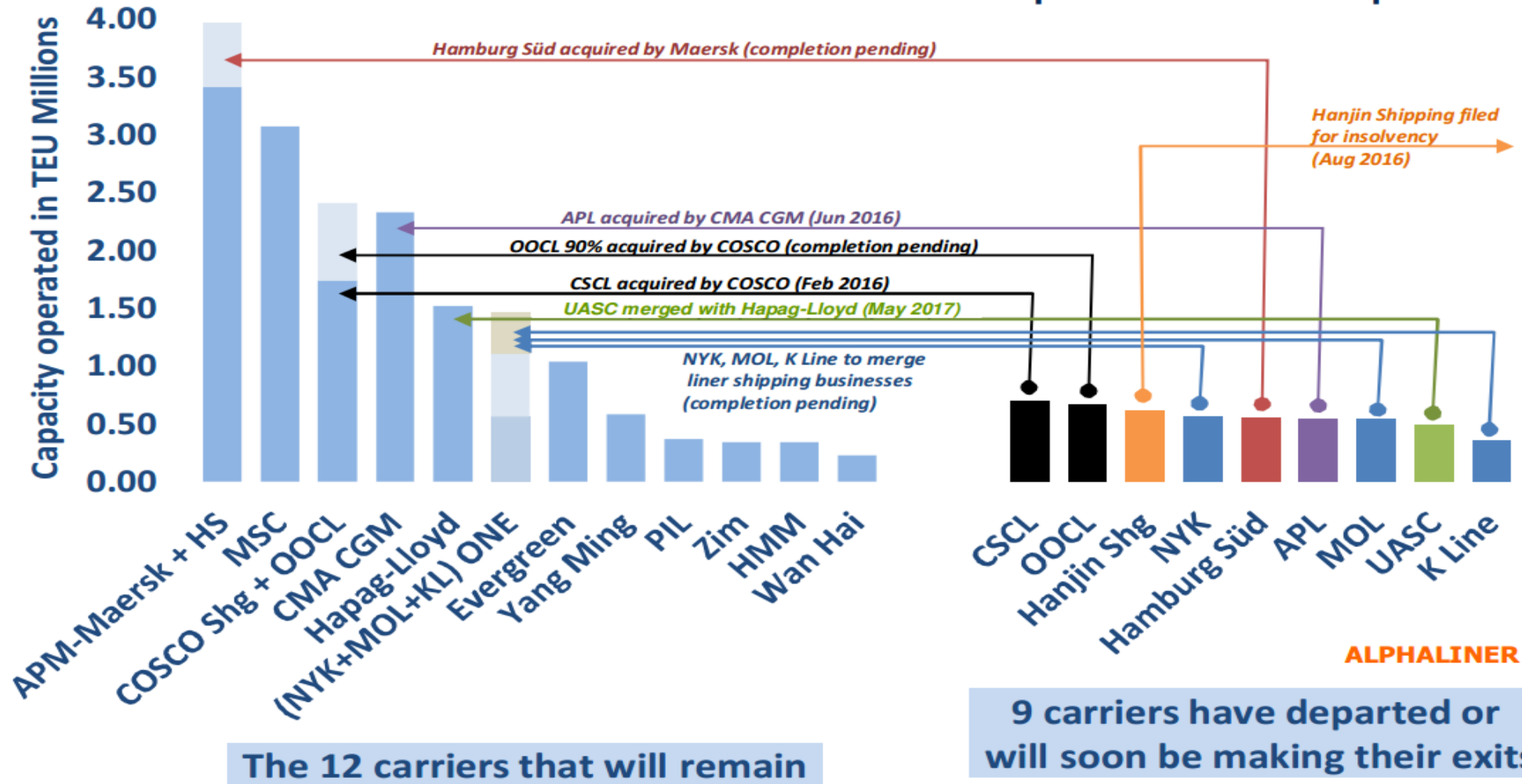
2M



THE Alliance

Chart of the week

How the Top 20 became the Top 12





Maersk EVORA
Fully-profiled at 9 high on
deck

How big is big?

- Draft depends on loading and trim
- “Air draft” = Height - actual draft

Example:

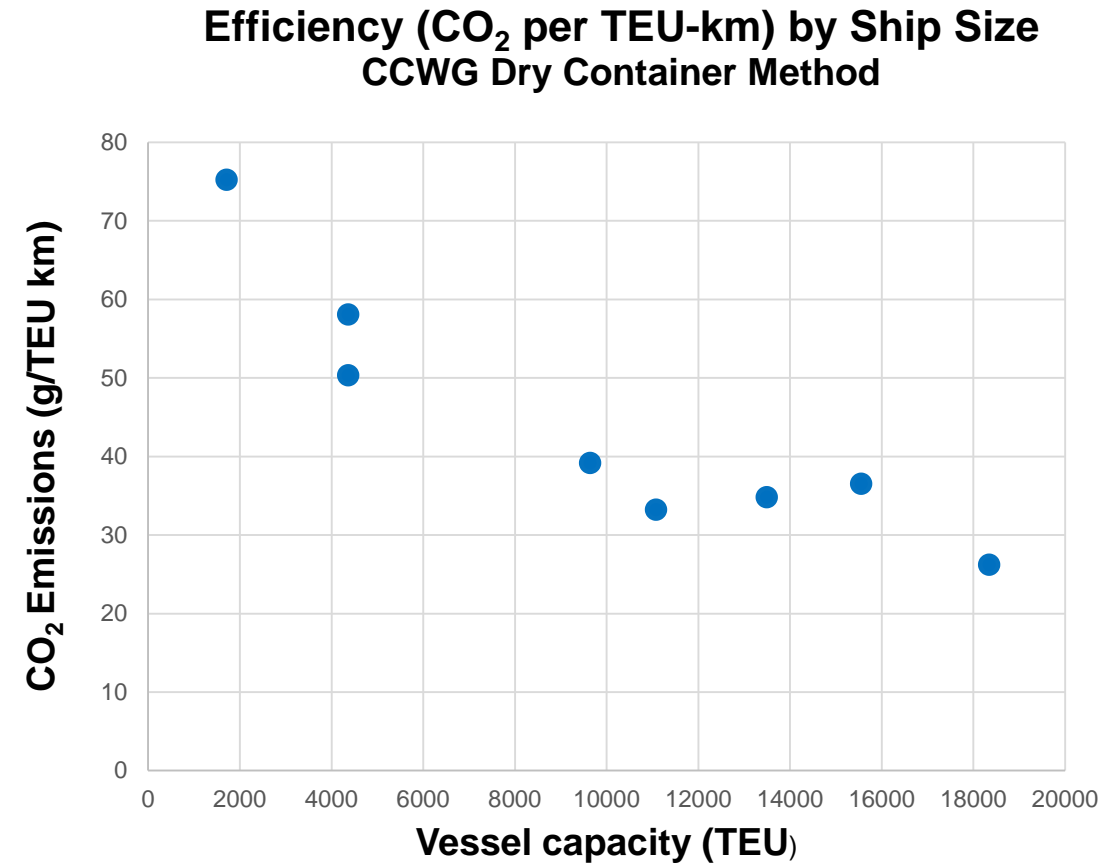
- Edinburgh class (13,000 TEU)
- Height from keel to mast: 66m
- Typical draft: 12.1m to 13.7m
- Air draft:
 - $66\text{m} - 12.1\text{ m} = 53.9\text{ m}$
 - $66\text{m} - 13.7\text{ m} = 52.3\text{ m}$



Vessel	TEU	LOA (meters)	Beam (meters)	Keel to top of mast (m)	Max Summer Draft (m)	Air draft @ Summer draft (m)
MAERSK WOLFSBURG	1,713	175	28	45.3	9.5	35.8
SL CHAMPION	4,360	292	32	55.2	13	42.2
SUSAN MAERSK	9,640	347	43	63.4	15	48.4
GEORG MAERSK	11,078	367	43	68	15.9	52.1
MAERSK EDMONTON	13,492	367	48	66	16	50
EMMA MAERSK	15,550	399	56	73	16	57
MAJESTIC MAERSK	18,340	399	59	73	16	57

Vessel size, age, equipment and speed are the major determinants of fuel consumption and emissions.

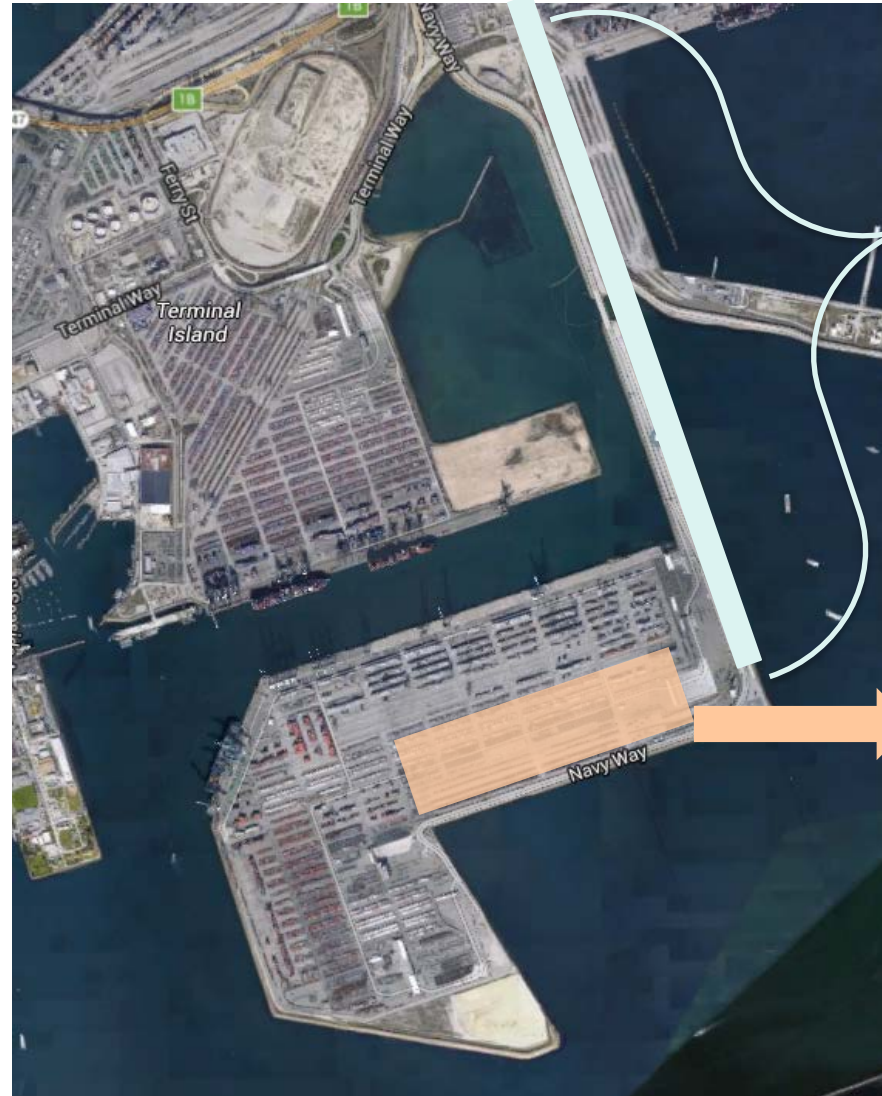
Vessel	TEU	CO ₂ Dry g/TEU km	Year built
Maersk Wolfsburg	1,713	75	2010
SL Racer	4,360	58	1995
SL Champion	4,360	50	1994
Susan Maersk	9,640	39	1997
Georg Maersk	11,078	33	2004
Maersk Edmonton	13,492	35	2011
Emma Maersk	15,550	37	2006
Majestic Maersk	18,340	26	2013



Methodology: Clean Cargo Working Group <https://www.bsr.org/en/collaboration/groups/clean-cargo-working-group>
Maersk Line data is verified by Lloyd's Register

Marine terminals are the nexus of all marine - land transfers, and must function efficiently while meeting increasing rules.

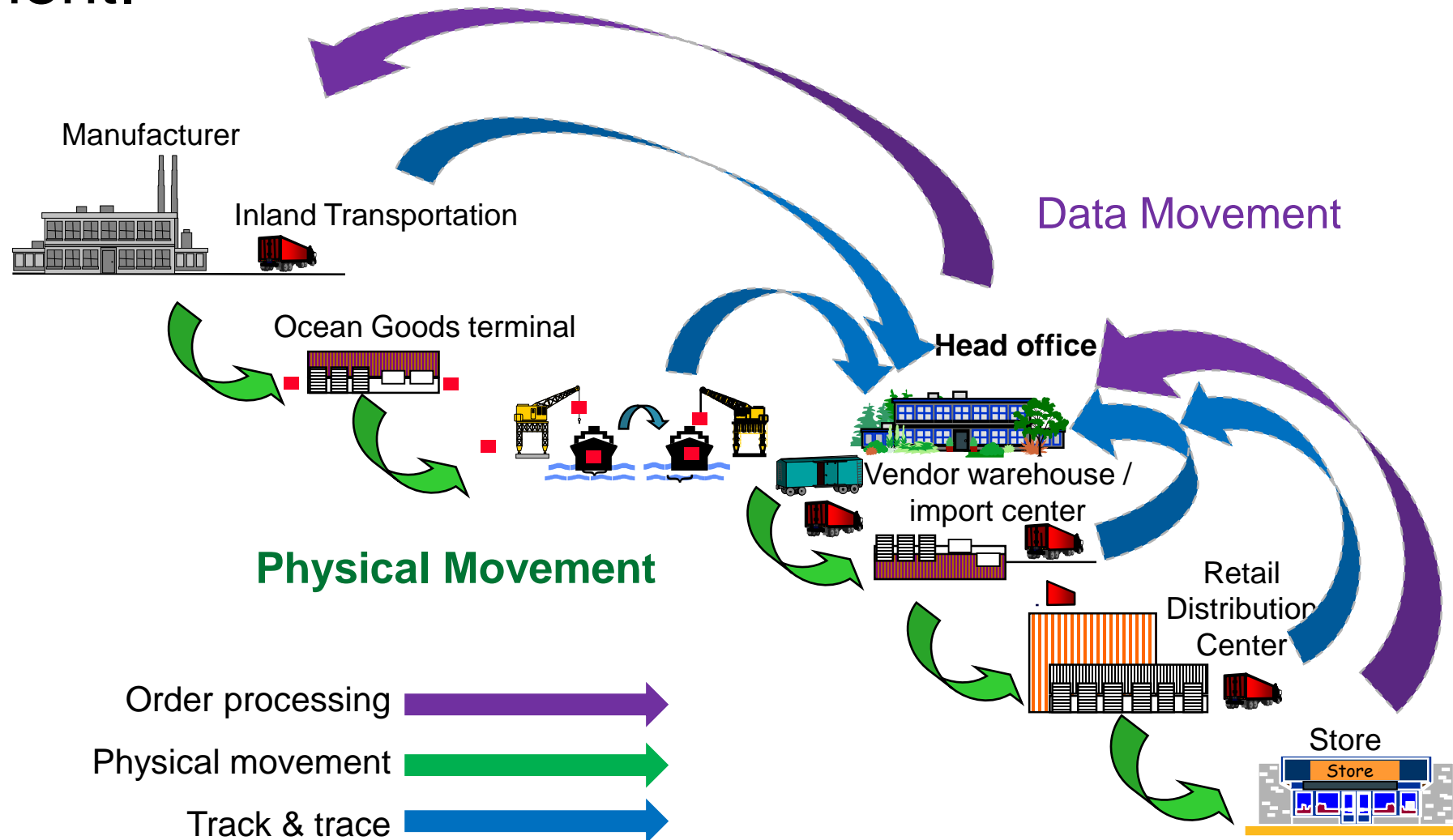
- Berth: 7,190 ft (2.2km) with 5 berths
- Cranes: 19 SPPM, with 4 cranes heightened for 10/11 high
- Land: 507 Acre
- 2200 reefer plugs



On-dock rail facility:

- 25 acres of dedicated storage tracks
- Total 6 tracks (5 storage + 1 runway)
 - 5 x 22 stack trains = 1,100 FEUs
 - 6,700 ft/track (total length 12 km)
- 41 acres of dedicated working tracks
- Total 12 tracks (3 tracks/bundle x 4)
 - 2,400 ft/track (total length 8.8 km)
 - Work 2 full-length trains at once

The international supply chain relies on data as well as equipment.



Graphic source: Tim Feemster, Foremost Quality Logistics

Who controls cargo routing?

It starts with the Beneficial Cargo Owner (BCO)

	Ocean	Truck	Rail	Freight Forwarder
BCO	Booking may be port to port or more extensive	Pick up with owned or contract hauler or book through the Line	Usually booked by Line or freight forwarder	May book any portion of the trip
Terminal	Contract	Screen for entry requirements; no contract	Loading services only – no contract	No relationship
Port	No contract, may provide environmental plans or incentives	No contract – may have entry requirements or incentive programs	Possible long term track usage agreements	No relationship

Lease or operating agreement

Hot topics for marine transportation

Rules for international shipping are set by the International Maritime Organization (IMO)

Air emissions and Greenhouse gases

➤ **SOx – Sulfur Oxides – Fuel Standards**

- Emission Control Areas (ECA): 0.1% Sulfur
- Global: 3.5% Sulfur to 2020, then moving to 0.5% Sulfur
- Enforcement

➤ **NOx – Nitrogen Oxides – Engine standards**

➤ **Greenhouse gases and energy efficiency:**

- IMO Metrics for vessels:
 - Energy Efficiency Design Index (EEDI)
 - Energy Efficiency Operations Index (EEOI)
 - Ship energy efficiency plans (SEEMP)
- **NEW: Industry CO₂ reduction goals**

Invasive species (Ballast Water & Biofouling)

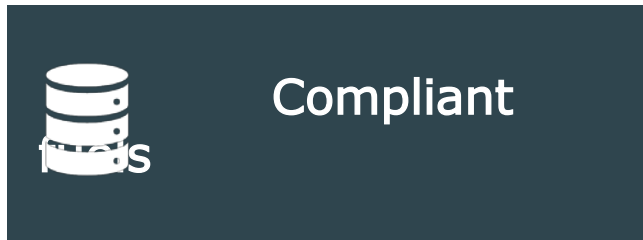
- IMO Ballast Water Convention entered into force Sept. 2017
- USCG's technology approval approach is different from the rest of world.
- Some states seek tighter standards for ballast water treatment.
- California and New Zealand have Hull Biofouling regulations.

Endangered Species (Whales, Orcas, other)

- Ship strikes
- Underwater sound

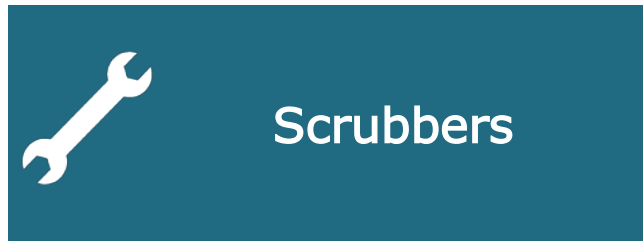
IMO 2020 GLOBAL SULPHUR CAP AND IMPLICATIONS

There are three main options for compliance...



....all still holding significant risks and uncertainties

- Stability
- Compatibility
- Flexibility



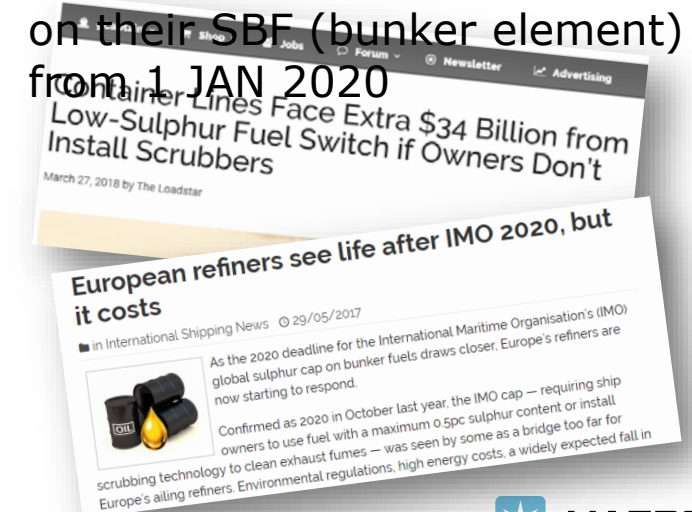
- Regulatory uncertainty: Open loop operation may be prohibited
- Down time risk. Compliant fuel back up



- No operational experience
- More complex fuel handling
- Safety issues
- Uncertain supply situation

Commercial implications

- Total cost increase for shipping industry is likely 30+ Billion USD
- Maersk will adjust way we calculate our SBF (bunker element) to reflect the cost increase
- Customers will face an increase on their SBF (bunker element) from 1 JAN 2020



Thank you

