Environmental Metrics for Shipping and Ports

EPA Port Stakeholders Summit

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Port and terminal performance plays a major role in vessel environmental impact.

- Why?
  - Product guarantee
  - Customer satisfaction
  - Asset optimisation
  - Reduction of **WASTE**
    - Waste in the supply chain has a direct negative impact on the environment
- Efficiency reduces wasted time and resources at dock
- Shore-side infrastructure is a critical part in efficient movement and environmental impact.

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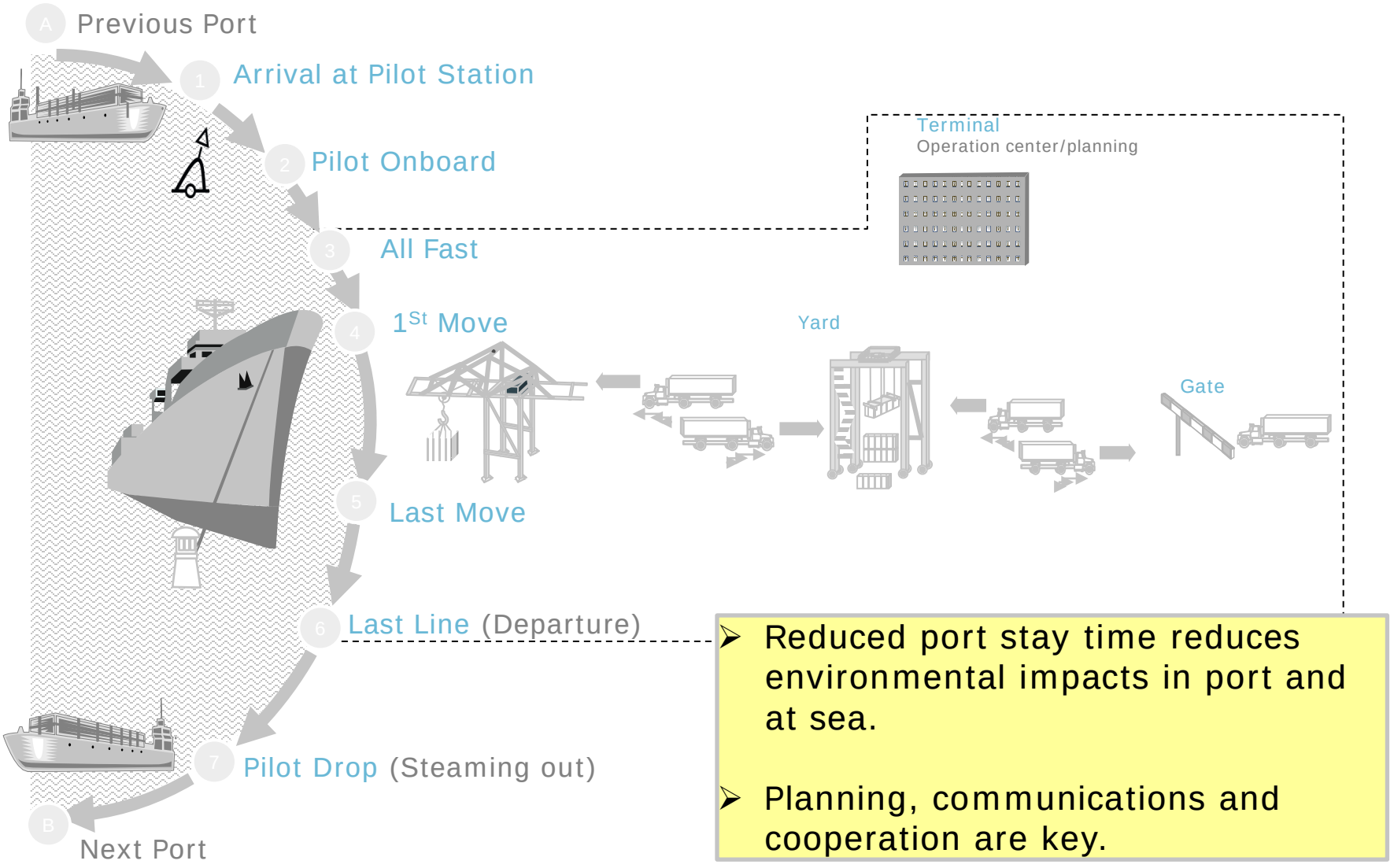
Vessel view of port operations



- Reduced port stay time reduces environmental impacts in port and at sea.
- Planning, communications and cooperation are key.

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Measurement and transparency are critical to environmental progress.

Standard methods exist to report environmental impacts of ocean shipping. The best-accepted is BSR's Clean Cargo Working Group.

- Annual Environmental Data Collection since 2005
- **2014 CCWG study includes >85% of containers shipped globally**
- Standardized CO_2 analysis
  - Vessels factors are based on fuel used, distance steamed and containers carried.
  - Third party verified
  - Publish trade lane averages.

http://www.bsr.org/en/our-work/working-groups/clean-cargo

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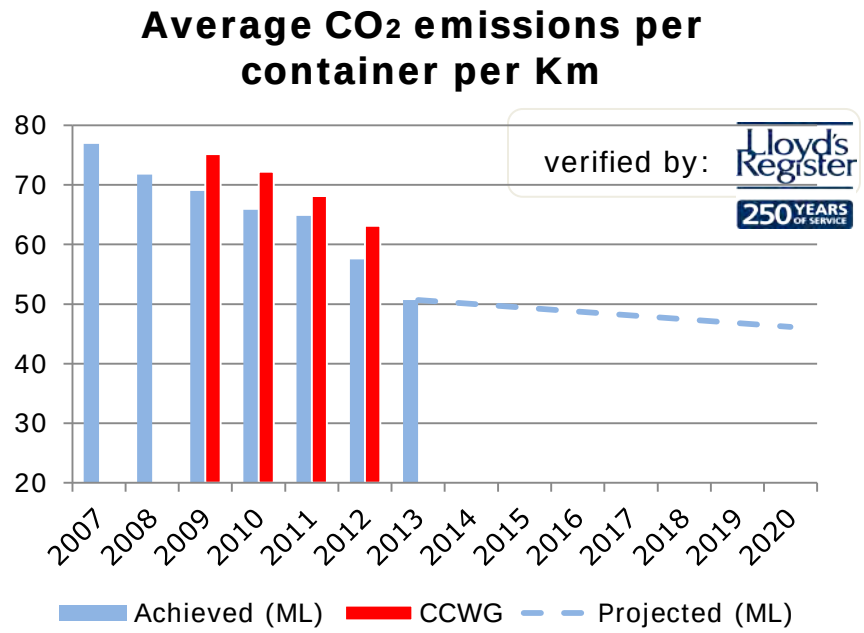
Vessels are increasingly fuel efficient.

This reduces fuel use, CO_2 and other air emissions.



Key Initiatives

- Triple E vessels
- Steady steaming
- Eco-Retrofitting vessels
- Network planning and execution
- Fleet additions and cascading

Focus on energy efficiency for sustained performance

- **Our air emissions dropped 12% per container in 2013 while volume grew 4%.**
- **CO2 reduction goal is 40% by 2020.**

34%

less CO_2 per container per km 2007 - 2013!

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It’s not just the biggest ships – it’s having the right ships for the service needs.

Triple E – 18,000 TEU
- 50% more efficient than the CCWG Asia-Europe trade lane average
- Delivery July 2013 to 2015

WAFMAX class – 4500 TEU
- 28% less CO2 per TEU
- 22 vessels

SAMMAX class – 7500 TEU
- 25 to 50% less CO2 per container
- 16 vessels

- **137 existing vessels were upgraded in 2013 (121 owned and 16 chartered)**

Majestic Maersk visited Copenhagen on her maiden voyage.

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Innovation is essential for sustainability on both new and existing vessels

- *Waste heat recovery system*
- *Propeller, hull & trim optimization*
- *Antifouling hull paint*

Other Initiatives

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

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Cleaner fuels have reduced toxic air emissions in port and in our Emissions Control Area.

<u>Voluntary fuel programs in the US & Canada since 2006</u>:

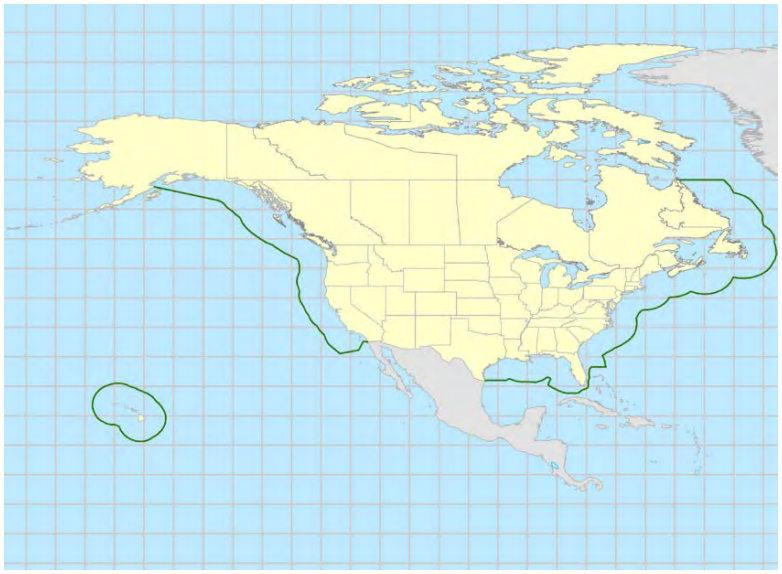
- Fuel is the 2015 ECA fuel <0.1%S
- Reduced emissions significantly:

SOx	90-95%
Particles (PM)	80-86%
NOx	6-10%

- North American Emissions Control Area in force since 2012.

- ***In 2015 the ECA requires 0.1%S***

- How do we measure and accelerate environmental progress in 2015 and beyond?



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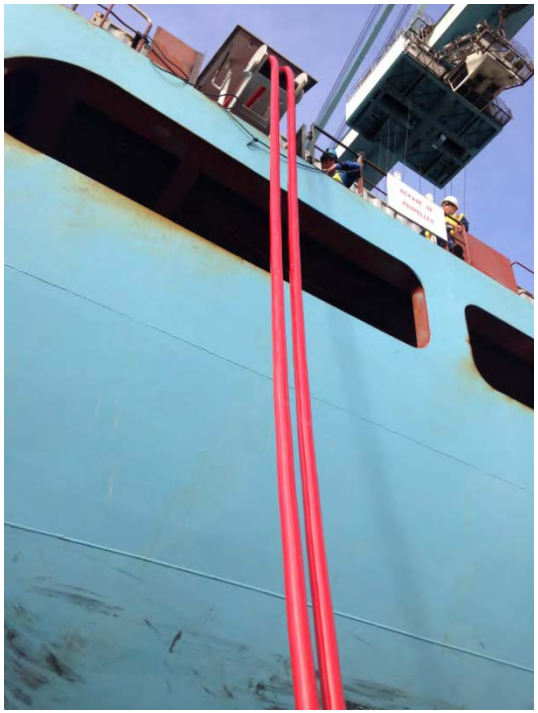
Is shore power the answer?

The jury is still out for container vessels…



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Surprising facts about Liner Shipping that impact program planning:

1. Schedule conformance is critical for both cost and air emissions – and those schedules must change over time.
2. International vessels spend only about 5% of their lifetimes in the waters of any one country or state.
3. Vessels operate with total crews of only 16 to 24.
4. Homeland Security and other rules require notice, planning and proper ID to visit or sail with a vessel.
5. The old growth projections of “10% forever” are obsolete.
6. The rest of the world uses metric units for environmental, supply chain and other calculations.

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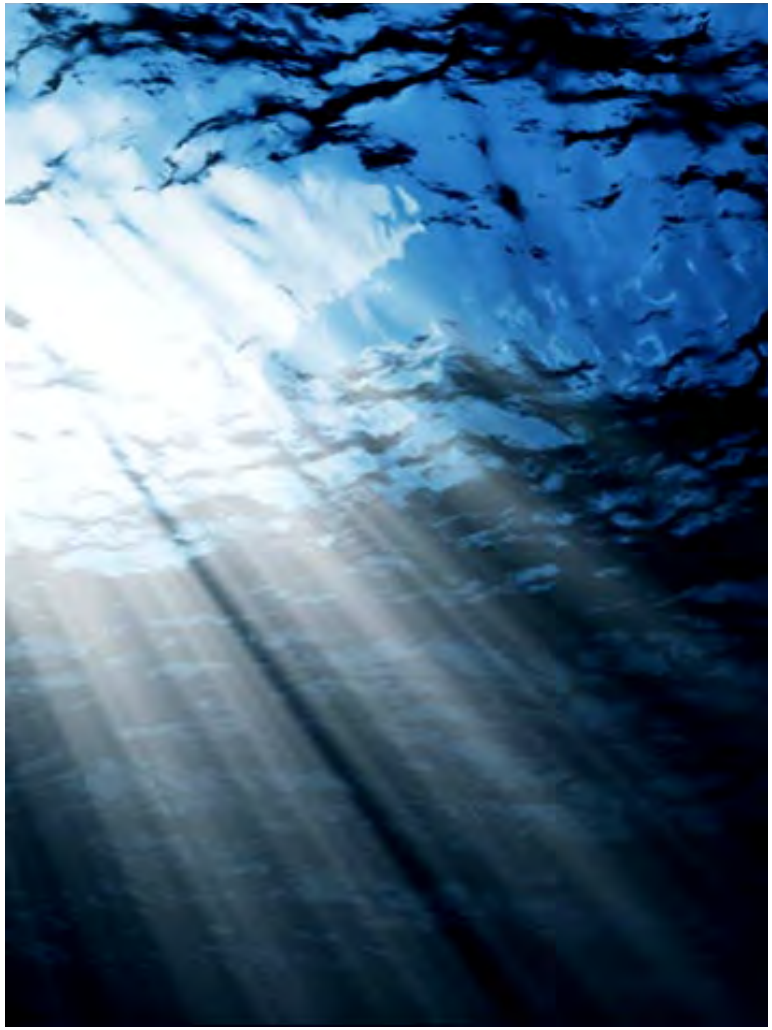
What challenges delay port environmental improvements today?

1. Communication is sporadic
2. Lacking a common framework, language and metrics
3. Many individual initiatives that create confusion
4. Need for stronger alignment between ports, terminals and lines on environmental programs and objectives.
5. Limited mechanism for input by other stakeholders.



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How can port stakeholders work together to accelerate progress?

- Industry wants to reduce our impact
  - Limited resources
  - Cannot pass costs to shippers
- Make it easy
- Help level the playing field:
  - Enforce the rules!
  - Incentives work
  - Coordinate voluntary and mandatory programs
- Consider each stakeholder's concerns and resources.

Specifics that help

- Build on international standards and upcoming rules
- Minimize administrative burdens
- Align metrics with priorities and goals
- Set goals in terms of environmental outcomes, with flexible approaches
- Promote innovation, efficiency and operational flexibility
- Avoid disincentives

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Thank you

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