Supply Chain Logistics and the Role of Ports

SEDC Ports Workshop Nov. 28, 2017
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Director, Environment & Sustainability
Maersk Line
90% of internationally traded goods are transported by sea.

SHIPPING ENABLES TRADE AND AFFECTS THE LIVES OF BILLIONS.
Ocean shipping is the most energy-efficient way to move cargo long distances…

*But is impacting the planet*

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

Ocean shipping generates ~2% of all man-made CO₂.

http://climate.nasa.gov/news/860 - Atmospheric NOx density
Port-related operations are significant sources of air emissions and greenhouse gases.

Many ports are in areas with existing air quality challenges and nearby populations.

The largest sources of port-related emissions are vessels and trucks.

Source: EPA CAAAC Ports Workgroup Recommendations
Agenda

1. How ocean shipping works
2. Shipping and environmental impacts
3. The EPA Ports Initiative
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 vessels have strict routes and schedules.

Routes require several weeks, so multiple vessels are scheduled on each route to provide regular service (weekly).
A 14 week round trip requires 14 vessels.

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

<table>
<thead>
<tr>
<th>Port Name</th>
<th>Arrival Date</th>
<th>Departure Date</th>
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<tbody>
<tr>
<td>Hong Kong</td>
<td>16 Apr 2010</td>
<td>19 Apr 2010</td>
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<td>Los Angeles</td>
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<td>29 May 2010</td>
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<tr>
<td>Tanjung Pelepas</td>
<td>01 Jun 2010</td>
<td>02 Jun 2010</td>
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<td>Jeddah</td>
<td>11 Jun 2010</td>
<td>12 Jun 2010</td>
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<td>Suez Canal</td>
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<tr>
<td>Barcelona</td>
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<td>08 Aug 2010</td>
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The conversation starts with transparency

Container shipping is the most energy efficient means to move high volumes of goods across long distances.

However, in absolute terms, the environmental impacts of the industry are significant.

Our fleet environmental impacts, 2016:

1. Fuel consumption: 9.4 million tonnes
   - CO₂ emissions: 30.5 million tonnes
2. SOx emissions: 489,000 tonnes
   - NOx emissions: 751,000 tonnes
3. Waste: 125,000 tonnes
4. Ballast water, risk of discharges or spills
5. Use of paint and chemicals
Vessels are significant sources of air emissions in ports. Improvements are clear, but the vessel share is growing as other modes have reduced emissions more quickly. (source: Port of Los Angeles 2016 emissions inventory)
Supply chain transportation environmental impacts can be calculated.

Factors include:
- Modes of transportation used
- Energy efficiency of each mode
- Distance traveled by each mode
- Cargo weight and volume
- Methods - How is the impact calculated? Is it verified?
The number of supply chain transportation reporting and metrics systems is increasing. Many of these are focused on CO2, and only a few on criteria pollutants.

**Mandatory**
- IMO – vessels
  - MARPOL VI – SOx, NOx
  - EEDI – new vessels
  - SEEMP
  - Operational metrics
  - Alignment?

- Europe – MRV
  - Measurement, Reporting & Verification

**Voluntary**
Standard methods are available to report the environmental impacts of ocean shipping. The best-accepted are from the Clean Cargo Working Group.

>85% of the global container capacity in CCWG membership

- Annual data collection and benchmarking since 2005
- Standardized CO₂ industry methodologies
- Verification protocol.
- Enables customers to make informed decisions and integration of sustainability into the supplier selection process.
Vessels are increasingly fuel efficient (so use current data) 
This reduces fuel use, CO$_2$ and other air emissions in our customers’ supply chains.

2016 results:
- **Maersk Line** - 42% less CO$_2$ per container per km vs. 2007
- **CCWG** – 34% vs. 2009

**How?**
- New vessels
- Eco-Retrofitting vessels
- Network design
- “Smart steaming”
- Big data

2020 Maersk Line goal: Reduce CO$_2$ by 60% vs. 2007
Decoupling volume transported and CO₂ emissions

The graph shows actual development in absolute reductions in CO₂ emissions at growing volumes transported by Maersk Line.

Growth in transported containers (TEUs)

2007

25%

2012

18%

2016

21%

Reduction in global CO₂ emissions (tonnes)
Overview of EPA’s Ports Initiative

EPA Contact: Sarah Froman
U.S. EPA - OTAQ
Vision for the Ports Initiative

People living and working near ports across the country will breathe cleaner air and live better lives as a result of bold steps taken through a collaboration of industry, government, and communities to improve environmental performance and increase economic prosperity.
## Ports Initiative Workgroup 2014-16

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<th>Port Community Advocates:</th>
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### Ports:
- Maryland, Charleston, Long Beach, New Orleans, Virginia

### Terminals:
- Ports America

### Shippers:
- Cargill, Walmart, HP

### Equipment:
- Caterpillar, Manufacturers of Emission Controls Association

### Marine:
- Maersk Line

### Rail:
- Burlington Northern Santa Fe

### Trucking:
- Evans Delivery

### Port Community Advocates:
- East Yard Communities for Environmental Justice, Southeast CARE Coalition, Steps Coalition

### Tribes:
- Fond du Lac Air Program

### NGOs:
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Full list of individual members available at [www.epa.gov/caaac](http://www.epa.gov/caaac)
Recommendations from Workgroup (September 2016)

**Overarching recommendation**: provide funding, technical resources, and expertise to enable and encourage environmental improvements.

**Focal Areas**
- Increasing and Targeting Funding
- Community-Port Engagement
- Guidance on Inventories and Metrics
- Guidance on Emission Reduction Strategies
- Coordinating Relevant Government Programs
- Information Clearinghouse and Communications

[www.epa.gov/caaac](http://www.epa.gov/caaac)
EPA Ports Initiative Elements
www.epa.gov/ports-initiative

Funding
Helping Ports Capitalize on Funding for Clean Technologies

Technical Resources
Providing Tools to Help Identify Smart Infrastructure Investments

Collaboration
Promoting Port-Community Collaboration for Effective Planning

Coordination
Increasing Efficiency in Federal Government and Port Operations

Communications
Creating a Knowledge Clearinghouse
Thank you