Mobilizing the implementation of concrete actions
The Home Depot’s Green Supply Chain – Real-world case study highlighting impacts and potential of emission reduction strategies

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Let’s first categorize strategies/actions in three broad categories

**Clean & Efficient Logistics**

Strategies to improve supply chain efficiency through reduction of vehicle activity.
Let’s first categorize strategies/actions in three broad categories

Clean & Efficient Modes

Strategies to leverage the use of the cleanest and most energy efficient modes.
Let’s first categorize strategies/actions in three broad categories

**Clean & Efficient Equipment**

Strategies to improve truck/rail/vessel efficiency through technologies or eco-driving.
The Home Depot’s Green Supply Chain
Objectives

- Identify and showcase effective technologies and strategies to enhance energy and environmental performance of global supply chains.
  1. Model existing strategies based on THD’s real-world operations. Benchmark emission and energy savings adopted by a leading SmartWay partner.
  2. Assess potential strategies for future implementation. Measure the expected benefits and identify priority areas for further improvement.
  3. Highlight key stakeholders and potential collaboration to facilitate the implementation of additional strategies.
The analysis evaluates these three types of strategies for each supply chain link based on real-world data.

1. **China in-land**
   Products shipped from supplier’s factories to Shenzhen/Yantian terminals.

2. **Marine**
   Containers with products shipped across Pacific Ocean to Los Angeles port.

3. **U.S. Drayage**
   Containers transported from Los Angeles port to transload facility or closest distribution center.

4. **U.S. in-land**
   Aggregated products at transload facility distributed to distribution centers.

5. **DC to Stores**
   Final delivery from distribution centers to stores.

Distances:
- China to Shenzhen: 64mi
- Shenzhen to Los Angeles: 7456mi
- Los Angeles to distribution centers: 35mi
- DC to Stores: 173mi
The analysis considers three scenarios to evaluate emission reduction strategies:

- **Conventional Scenario**: Basic supply chain without strategies considered in the green scenario, instead those strategies are replaced by industry average or basic operational practices.

- **Green Scenario**: Actual supply chain considering improvements already adopted (green strategies).

- **Green Plus Scenario**: Supply chain with additional improvements to those already implemented in the green scenario. To consider implementation timeframe, we divide this scenario into:
  - Short-term (2020)
  - Medium-term (2025)
  - Long-term (2030)
### Strategies evaluated

<table>
<thead>
<tr>
<th>Strategy Type</th>
<th>Strategy</th>
<th>Supply chain Link</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>China</td>
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<tr>
<td>Clean and efficient logistics</td>
<td>Consolidated Freight Station (CFS)</td>
<td>●</td>
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<tr>
<td></td>
<td>Cube Optimization</td>
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<td></td>
<td>Cargo aggregation (Transload)</td>
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<td>Multistop and routing</td>
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<td></td>
<td>Floor Loading</td>
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<td></td>
<td>Direct routing + Short Sea Shipping</td>
<td>●</td>
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<tr>
<td></td>
<td>Schedule optimization (port and ship)</td>
<td>●</td>
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<tr>
<td>Clean and efficient modes</td>
<td>Truck to Rail</td>
<td>●</td>
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<tr>
<td></td>
<td>Move to larger ships (Tripple E etc.)</td>
<td>●</td>
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<tr>
<td>Clean and efficient equipment</td>
<td>Shore power</td>
<td>●</td>
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<td></td>
<td>Slow steaming</td>
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<td></td>
<td>Vessel technology</td>
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<td></td>
<td>Vessel operations</td>
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<tr>
<td></td>
<td>Truck Technology</td>
<td>●</td>
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</tbody>
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- ● Strategy applied to Green scenario
- ● Strategy applied to Green plus scenario
Overview of supply chain emissions

180 million ton-km

Total CO2 (metric tons)

8.4 gCO₂/km

0 100 200 300 400 500 600 700 800
Total CO2 (metric tons)

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140
gr CO2/ton-km

180 million ton-km

Total ton-km (millions)

0 20 40 60 80 100 120 140 160 180
Total ton-km (millions)

China In-land  Marine  US Dray  US Inland  SDC to Store  RDC to Store
Current available technologies and strategies reduced CO$_2$ emissions by 25% with respect to the conventional supply chain. Adopting advanced strategies can further reduce CO$_2$ by 36%.
Vessels are increasingly fuel efficient

Maersk Line fleet average 2017 vs. 2007: **43% less CO₂ per container per km**

Clean Cargo Working Group industry average 2017 vs. 2009: **36% less CO₂ per container per km**

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

Source: Maerk (2018)
Technology plays an important role in the reduction of local air pollutants. For marine, although technology strategies in the Green scenario have reduced air pollutants by 22%, it has the opportunity to further reduce air pollution by at least 50% from current levels.
For land-based links, cleaner vehicles reduce air pollutants (NOx, PM and BC) by half or more with respect to conventional technologies. Moving towards soot-free HDVs and cleaner locomotives will virtually eliminate these emissions.
Key takeaways

- For supply chain efficiency, a combination of technology and operational strategies is necessary to leverage supply chain efficiency improvements.
- The marine sector accounts for the majority of local air pollutant emissions, and technology plays an important role in their reduction.
- For land-based links, moving towards soot-free trucks and cleaner locomotives will virtually eliminate emissions of local air pollutants.
Group dynamics
Each participant chooses one station
30 minute discussion
Each moderator (or assigned participant) will summarize the discussion of each station to the rest of the group
Please discuss strategies around these three themes, including the roles of green freight programs/initiatives, industry and government, expected benefits, barriers and feasibility, and opportunities for collaboration between industry and government.

Are green freight programs and initiatives doing a sufficiently good job in promoting these strategies? How can they be leveraged or adapted to mobilize the implementation of these strategies?

Are there particular strategies that you believe result in substantial benefits and where collaboration between industry and government can help overcome barriers?