The Carbon Footprint of Freight: 
Tools & Methods

Different Perspectives on Measuring the Carbon Footprint of Transportation

Ashton Shaw
Sr. Lean Coordinator - Sustainability
October 25th, 2012

Con-way's Operating Companies

Supply Chain Management

Founded: 1991
2010 revenue: $1.5 billion
Employees: 6,500
Geographic scope: 5 continents
Non-asset based

LTL Transportation

Founded: 1983
2010 revenue: $3 billion
Employees: > 16,000
Geographic scope: North America
Trucks: 8,600 Trailers: 25,600

Truckload Transportation

Founded: 1951
2010 revenue: $570 million
Employees: 4,000
Geographic scope: North America
Trucks: 2,900 Trailers: 8,200
Warehousing, Manufacturing Support and Distribution Services

- Site location analysis
- Facility sizing and design
- Dynamic slotting
- Inventory management
- Full service distribution
  - Pick and pack
  - Kitting
  - Value added services
- Vendor managed inventory
- RFID technology
- WMS with radio frequency
- Export consolidation
- Reverse logistics
- Reporting / Metrics

Transportation Management

- Planning, Operation, Execution
  - Transportation management IT platforms
  - Procurement
  - Rates
  - Shipment optimization
  - Tracking
  - Financials
  - Reporting / metrics
  - Contracts
  - Freight audit and pay
- Strategic Planning
  - Shipment aggregation and pooling
  - Total Landed Cost + Carbon
  - Modal optimization
  - Zone skipping
  - Continuous moves
  - Multi-stop truckload
  - Merge-in-transit
  - Cross docking / transloading
  - Sea-air vs. pure air or sea
Voice of Customer, Voice of Menlo

As a 3PL, we manage the nodes and flows in our customers' supply chain which also account for our own Scope 1 and 2 GHG inventory. Both our customer and internal leadership are seeking:

- Support / enable sustainability initiatives
- Strategic and tactical carbon management across the supply chain
  - Network modeling to minimize cost and carbon within business requirements
  - Routing logic to ID most carbon efficient mode / carrier (SmartWay)
- Current state, benchmarking and ongoing reporting/analytics of supply chain emissions
- Goal and abatement management (NPV)
- Risk mitigation
- PR / marketing opportunities
- Product level GHG accounting

Technology Analysis: Make vs. Buy

**PRO**

**Buy**
- ‘Sustainability’ expertise
- Brand awareness / new client exposure
- 3rd party credibility

**Make**
- Lean approach
- Supply chain expertise
- Access to customers and data
- Increased flexibility
- Leverage / integrate with existing tools

**CON**

**Buy**
- Limited partnership interest / $$$
- Technology focused on organizational scope 1 and 2 reporting
- No technology available connecting nodes and flows across value chain (scope 3)

**Make**
- Longer time to market
- No ‘Sustainability’ expertise
- Capital investment
CarbonNet Highlights

**INPUTS**

<table>
<thead>
<tr>
<th>VOICE OF THE CUSTOMER</th>
<th>CREATE NODE PROFILE CAPTURE EMISSIONS DATA</th>
<th>OUTPUTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LAWS, REGULATIONS, STANDARDS, PROTOCOLS, TAX INCENTIVES, GOVERNMENT DATABASES</strong></td>
<td><strong>CARBON VSM NODE / FLOW ANALYSIS &amp; COMPARISON REPORTING AND ANALYTICS</strong></td>
<td><strong>NETWORK OPTIMIZATION CARBON ABATEMENTS GOAL TRACKING</strong></td>
</tr>
</tbody>
</table>

- “Active management of suppliers emissions”
- “Zero waste in European operations by 2020”
- 20% reduction in kWh/Sq Ft by 2015
- 100% SmartWay carriers

**OUTPUTS**

Cloud Based

- CarbonStream Map
  - *Product CarbonStream*
  - *Menlo Managed*

Analytics

Abatement

**INPUTS**

**OUTPUTS**

**Final Assy.

x

Zip code 1687. 20**

**Scope 1 - Natural Gas kg**

323.33

**Scope 2 - Electric kg**

22.91

**Scope 3 - Diesel Fuel kg**

394.88

**Scope 3 - Propane Fuel kg**

0.06

**Scope 3 - Waste kg**

0.00

**Scope 3 - Water gallon**

2428.38

**Total CO2 Impact kg**

3906.44

**Scope 3 - LTL kg**

9766.10

**Scope 3 - TL kg**

13672.5

**Total CO2 Impact - Truck kg**

13672.5
*Product CarbonStream
*Menlo Managed