Smart Freight Leadership to drive the transformation of the logistics sector

Sophie Punte
Executive Director, Smart Freight Centre
Chair Sustainability Working Group, ALICE-ETP
Coordinator EC-project LEARN

IPIC 2018: 5th International Physical Internet Conference
Groningen, Netherlands, 21 June 2018
Logistics emissions on the rise but must come down

Smart Freight Centre (2017). Smart Freight Leadership, based on data from ITF Transport Outlook 2017 and SLoCaT 2016
Freight is a significant source of air pollution.

Smart Freight Centre, Smart Freight Leadership (2017)
Logistics higher on corporate and government agenda

BUSINESS VALUE
- Compliance
- Costs
- Customers

SOCIETAL VALUE
- Climate
- Health
- Socio-economic

SUSTAINABLE DEVELOPMENT GOALS
PARIS AGREEMENT
European Commission
The key to emission reduction lies with business procurement power and collaboration to drive sector transformation.
Smart Freight Leadership

Efficient and environmentally sustainable global freight and logistics sector

Competitive advantage

Calculate & report

Advocacy & public policy

Set targets & KPIs

Collaborate across supply chain

Business decisions & actions

SMART FREIGHT LEADERSHIP

Smart Freight Centre
1. Calculate and report
Global Logistics Emissions Council: industry-led and backed by experts

**GLEC Members**

<table>
<thead>
<tr>
<th>Companies</th>
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<tbody>
<tr>
<td>HP</td>
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<td>DB</td>
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<td>SCHENKER</td>
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<td>DHL</td>
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<td>GES</td>
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<td>GEODIS</td>
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<td>Hapag-Lloyd</td>
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<th>Programs</th>
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<tr>
<td>BSR</td>
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<td>Green Freight Asia</td>
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<td>NTM</td>
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<th>Associations</th>
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<td>CLECAT</td>
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<td>IATA</td>
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<td>UPU</td>
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<td>Universal Postal Union</td>
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**GLEC Consultees**

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<th>Companies</th>
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<td>BNSF</td>
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<td>H.M.</td>
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<td>Kotahi</td>
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<td>Heineken</td>
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<td>Dearman</td>
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<td>ADENE</td>
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<td>Arola</td>
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<td>EcoTransIT</td>
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<td>Ivanhoe</td>
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<td>Rightship</td>
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<td>More Value Logistics</td>
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<table>
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<th>Associations</th>
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<tr>
<td>ACEEE</td>
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<tr>
<td>CEFIC</td>
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<tr>
<td>Centre de Logistica y Sostenibilidad, Argentina</td>
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<tr>
<td>Clean Transport Action</td>
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<td>ECTA</td>
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<td>IAPH</td>
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<td>ICHCA</td>
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<th>Organizations</th>
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<tr>
<td>Energy Saving Trust</td>
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<tr>
<td>Fraunhofer IML</td>
</tr>
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<td>ICCT</td>
</tr>
<tr>
<td>Index</td>
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</table>

**GLEC Experts**

<table>
<thead>
<tr>
<th>Experts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buddy Polovich (US SmartWay), Colin Smith (EST), Jens Froese (Jacobs University), Kerstin Dobers (Fraunhofer IML), Marc Cottignies (ADEME)</td>
</tr>
</tbody>
</table>
1. Calculate and report

GLEC Framework: universal method for logistics emissions accounting

Watch our animation video and download the GLEC Framework
www.smartfreightcentre.org/glec/what-is-glec
1. Calculate and report
LEARN Project: implement GLEC Framework

Mobilize businesses through improved emissions calculation, assurance and reporting

- Logistics emissions calculation
- Data assurance & reporting
- Business logistics decisions

- Guidelines
- GLEC data declaration
- ISO standard
- Training for carriers
- Company case studies
- Research agenda
- Policy agenda
- ‘Network of Networks’
- Annual workshop
- Link with ICT

www.learnproject.net
1. Calculate and report
Example: Better data by STEF (European specialist in cool chain logistics)

- Transport GHG Calculator built on GLEC Framework principles

- Track impact of actions:
  - Training of STEF’s 3000 drivers
  - Vehicle renewal to Euro 5 and 6
  - Transport scheme to optimize vehicle use
  - Increased monitoring of filling rate and empty mileage
  - Integration of fuel in ISO 50001 certification French sites
  - Purchasing criteria: fuel use control equipment & fleet composition
1. Calculate and report

Example: Transparency in calculation methodology by Volkswagen

<table>
<thead>
<tr>
<th></th>
<th>GLEC</th>
<th>AIR</th>
<th>INLAND WATERWAYS</th>
<th>RAIL</th>
<th>ROAD</th>
<th>SEA</th>
<th>TRANSSHIPMENT CENTERS</th>
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<tbody>
<tr>
<td>P1: EMISSIONS ACCOUNTING</td>
<td>Annually</td>
<td></td>
<td>Monthly</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>P2: CHOICE OF EMISSION FACTOR</td>
<td>WtW</td>
<td>CO2e</td>
<td>WtW</td>
<td>CO2e</td>
<td></td>
<td></td>
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<tr>
<td>P3: UNIT OF ALLOCATION</td>
<td>ton-km</td>
<td></td>
<td>ton-km</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>P4: LOAD FACTOR &amp; EMPTY RUNNING</td>
<td>Empty running include</td>
<td>Load Factor / Empty running included in Factor</td>
<td>Load Factor Calculated for each Leg of a Vehicle Trip, Empty running Included</td>
<td>Load Factor / Empty running included in Factor</td>
<td>No Emissions Factors available</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P5: DATA ACCURACY</td>
<td>Primary Data</td>
<td></td>
<td>Not available</td>
<td></td>
<td></td>
<td>Intermediaries</td>
<td></td>
</tr>
<tr>
<td>R1: TRANSPORT SERVICE CATEGORY</td>
<td>Differentiated by transport services</td>
<td>Calculation is based on Vehicle Tours / Transport Legs</td>
<td>Statistics are aggregated after calculation for Transport Services / Transport Processes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R2: DISTANCE MEASUREMENT</td>
<td>Depends</td>
<td>GCD+95km</td>
<td>EcoTransIT</td>
<td>PTV Map&amp;Guide</td>
<td>Actual Route including Stop-Over Ports</td>
<td>SFD between Ports + 5%</td>
<td></td>
</tr>
</tbody>
</table>

Calculation is based on emissions factors (gCO2e/ton-km)  
Fuel Consumption is considered when calculating emissions factors, but not saved
1. Calculate and report

Example: Breakdown in logistics emissions reporting by LVMH

30% of corporate emissions from upstream and downstream transportation

<table>
<thead>
<tr>
<th>BREAKDOWN OF THE GREENHOUSE GAS EMISSIONS GENERATED BY UPSTREAM TRANSPORTATION IN 2017 (in CO₂ equivalent metric tons)</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wines &amp; Spirits</td>
<td>11,682</td>
</tr>
<tr>
<td>Fashion &amp; Leather Goods</td>
<td>8,171</td>
</tr>
<tr>
<td>Perfumes &amp; Cosmetics</td>
<td>37,635</td>
</tr>
<tr>
<td>Watches &amp; Jewelry</td>
<td>1,841</td>
</tr>
<tr>
<td>Selective Retailing</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>59,329</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BREAKDOWN OF THE GREENHOUSE GAS EMISSIONS GENERATED BY DOWNSTREAM TRANSPORTATION IN 2016 (in CO₂ equivalent metric tons)</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wines &amp; Spirits</td>
<td>88,213</td>
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<tr>
<td>Fashion &amp; Leather Goods</td>
<td>164,723</td>
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<tr>
<td>Perfumes &amp; Cosmetics</td>
<td>210,876</td>
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<td>Watches &amp; Jewelry</td>
<td>31,972</td>
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<tr>
<td>Selective Retailing</td>
<td>24,408</td>
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<tr>
<td>TOTAL</td>
<td>520,192</td>
</tr>
</tbody>
</table>

2. Set targets and KPIs

Corporations

Governments & industry bodies

- Paris Agreement: keep average global temperature ‘well below’ 2°C above pre-industrial times and ‘endeavor to limit’ it to 1.5°C
- EU White Paper: 60% reduction Europe freight emissions by 2050 compared to 1990
- IMO: 50% reduction maritime shipping emissions by 2050 compared to 2008
- IATA: 50% reduction airline emissions by 2050 compared to 2005
2. Set targets and KPIs

Examples of corporations

- DHL
- Procter & Gamble
- Heineken

Reduce truck transportation kilometers by 20% per unit of production

MISSION 2050: NULL EMISIONEN

Achieved more than 25% reduction since 2010

including logistics emissions!!!
2. Set targets and KPIs

Example: DB Schenker linking targets to actions

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Land</td>
<td>- Reduction spec. CO₂ emissions (-20%)</td>
<td>![Graph] 84</td>
</tr>
<tr>
<td></td>
<td>Fleet modernization</td>
<td>![Graph] 16%</td>
</tr>
<tr>
<td></td>
<td>Eco Driving</td>
<td>![Graph] 16%</td>
</tr>
<tr>
<td>2 Ocean</td>
<td>- Vessel size</td>
<td>![Graph] 40</td>
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<tr>
<td></td>
<td>- Fuel optimization, de-rating</td>
<td>![Graph] 60%</td>
</tr>
<tr>
<td></td>
<td>- Telematics &amp; aerodynamics (route optimization)</td>
<td>![Graph] 60%</td>
</tr>
<tr>
<td>3 Air</td>
<td>- Reduction spec. CO₂ emissions (-52%)</td>
<td>![Graph] 95</td>
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<tr>
<td></td>
<td>Fleet modernization</td>
<td>![Graph] 5%</td>
</tr>
<tr>
<td></td>
<td>ATM, pilot training, etc. (operational)</td>
<td>![Graph] 5%</td>
</tr>
<tr>
<td>4 Stationary</td>
<td>- Reduction energy consumption per sqm</td>
<td>![Graph] 89</td>
</tr>
<tr>
<td></td>
<td>- Heating energy per sqm</td>
<td>![Graph] 11%</td>
</tr>
</tbody>
</table>

1) Only aircraft based development since 2014 because of lack of consistent airline data

3. Business decisions & actions

**REDUCE FREIGHT TRANSPORT DEMAND**
- Supply chain restructuring
- Standardized modules/boxes
- 3D printing
- Dematerialization
- Consumer behavior

**OPTIMIZE FREIGHT TRANSPORT MODES**
- Modal shift
- Multi-modal optimization
- Synchronmodality

**INCREASE ASSET UTILIZATION**
- Load optimization
- Load consolidation and asset sharing
- Logistics centers and warehouse management

**IMPROVE FLEET ENERGY EFFICIENCY**
- Cleaner and efficient technologies
- Efficient vehicles and vessels
- Driving behavior
- Fleet operation
- Fleet maintenance

**REDUCE CARBON CONTENT OF ENERGY**
- Cleaner and lower-carbon fuels
- Electrification
- Fuel management

Smart Freight Centre; categories based on A. McKinnon 2018
3. Business decisions & actions:
Roadmap toward zero logistics emissions

<table>
<thead>
<tr>
<th>Action</th>
<th>2015</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
<th>2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce freight transport demand</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optimize freight transport modes</td>
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<tr>
<td>Increase asset utilization</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improve fleet energy efficiency</td>
<td></td>
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<td></td>
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<tr>
<td>Reduce carbon content of energy</td>
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</tbody>
</table>

- **Toward Zero Emissions Freight**
  - R&D
  - Products, services, policies
  - Market acceptance

- 2015: ??%
- 2020: 30%
- 2030: 30%
- 2040: 30%
- 2050: 50%
3. Business decisions & actions:
Example: Heineken’s actions across the spectrum

- Reduce freight transport demand
  - Warehouse locations
  - Packaging Optimization

- Optimize freight transport modes
  - Shift to inland waterways
  - Shift to near-shore shipping
  - Green corridor to port

- Increase asset utilization
  - Minimum order and order combinations

- Improve fleet energy efficiency
  - Upgrading of trucks

- Reduce carbon content of energy
  - Electrification of delivery vehicles
  - Biofuels in barge shipping
3. Business decisions & actions: Physical internet example: redesigning logistics supply chains

Input: All possible locations, connections + rates from RFQ portal

...throw this at the optimizer...

Output: Least cost routing

Reproduced with permission from Inform, www.inform-software.com
3. Business decisions & actions:
Physical internet example: modular design

Reproduced with permission from
https://hal-mines-paristech.archives-ouvertes.fr/hal-01487239/document
3. Business decisions & actions:
Physical internet example: 3D printing of (spare) parts

Conventional

$\text{C} + \text{€} + \text{CO}_2$

3-D printing

$\text{C} + \text{€} + \text{CO}_2$

Adapted from: Audi AG I/VK-4 Potenzial des 3D-Drucks in der Automobil-Industrie
https://www.digitaltrends.com/cars/daimler-3d-printed-truck-parts/
https://www.automobil-industrie.vogel.de/index.cfm?pid=7516&pk=563331&fk=1119034&typ=article#2
4. Collaborate across the supply chain
4. Collaborate across the supply chain
Programs & initiatives

Sustainability / climate initiatives
- CDP
- SCIENCE BASED TARGETS
- THE SUSTAINABILITY CONSORTIUM
- Davis Jones Sustainability Indexes
- GEMI
- GRI
- FTSE4Good
- AIM-PROGRESS
- SUSTAINABLE PURCHASING LEADERSHIP COUNCIL
- ecoVadis

Sustainability business networks
- BSR
- THE B TEAM
- THE CLIMATE GROUP
- Ceres
- THE PRINCE OF WALES COMMERCIAL REGIONS GROUP
- other
- wbcasd
- WE MEAN BUSINESS
- other

Green freight programs
- SMART WAYS
- GREEN FREIGHT ASIA
- CLEAN CARGO
- LEAD & GREEN
- FRET 21
- SRF
- International Transport Forum
- Low CV
- Global Maritime Forum
- Rightship
- Global Green Freight
- other

Other sustainable freight / transport initiatives
- SMART WAY
- GREEN FREIGHT ASIA
- CLEAN CARGO
- LEAD & GREEN
- FRET 21
- SRF
- International Transport Forum
- Low CV
- Global Maritime Forum
- Rightship
- Global Green Freight
- other

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4. Collaborate across the supply chain
Example: HP Inc. building bridges across the sector

Reporting/disclosure initiatives

Green Freight Programs

Sustainability initiatives
4. Collaborate across the supply chain
Example: Sustainable purchasing that includes logistics

- IKEA I-Way: Environmental Performance Survey
- Unilever Responsible Sourcing Policy
- H&M: tier 1 and 2 suppliers climate neutral by 2030
- Scania: All logistics suppliers must meet 3% annual CO\textsubscript{2} reductions
- BMW: Supplier Performance Reviews top-100 suppliers
- FCA: Contractual clauses: No trucks < Euro III standard + 50% of supplier fleet >Euro V compliant
5. Advocacy for a long term strategy & public policy

**Business strategy**
- Sector strategy / roadmap
- Corporate strategy / roadmap

**Proactive public policy input**
- Nationally Determined Contributions
- National policy and roadmaps
- City freight plans

Only 21 (13%) of 158 NDCs mention freight [www.slocat.net](http://www.slocat.net)
5. Advocacy for a long term strategy & public policy

Example: Long term transport decarbonization strategy Port of Rotterdam

5. Advocacy for a long term strategy & public policy

Example: Call for ambitious truck standards in the EU

FINANCIAL TIMES

Business asks Brussels to set exacting CO2 targets for trucks

Companies combine to push for innovation in low-emission vehicles

Transport has been described as ‘Europe’s biggest climate problem’ © Bloomberg

Rochelle Toplensky in Brussels APRIL 18, 2018

5. Advocacy for long term strategy & public policy

Example: Scania’s role in trucking standards in China

- Truck size, dimensions & weight
- Consideration of energy efficient technologies
Final thought: ride the wave of sector transformation

Further reading

- Transport and Environment – www.transportenvironment.org
- Centre for Sustainable Road Freight www.csrf.ac.uk
- LEARN www.learnproject.net
- ALICE – www.etp-logistics.eu
- Global Fuel Economy Initiative: Targeting Heavy Duty Vehicle Economy (link)
Join our journey to Smart Freight

Contact us:
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eszter.toth-weedon@smartfreightcentre.org
www.smartfreightcentre.org