STATE OF THE ART IN CARBON FOOTPRINTING OF LOGISTICS ACTIVITIES

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Reduction goal Paris: Freight transport

CO₂-emissions freight transport in EU

Freight volume growth 1990-2050: 250%

Reduction of absolute emissions: 60%

Per ton-kilometre transported: FACTOR 6!

2050: 60% reduction relative to 1990

2030: 20% reduction relative to 2008

Note: Reduction goals freight transport assumed equal to overall reduction goal for transport sector in EU Whitepaper (2011)
LOW-CARBON “BUILDING BLOCKS”

Both technical and organizational measures belong to the solution

- km-reduction through improved logistics / supply chains
- modal shift
- improved efficiency of conventional vehicles
- sustainable / biofuels for conventional vehicles
- electricity and hydrogen in urban & regional applications

do measures add up to target?

Evidence-based assessment of CO₂ reduction & effectiveness of solutions

Synchromodality

PI solutions
CARBON FOOTPRINTING IS A TOOL FOR EMISSION REDUCTIONS

- **Carbon footprint** is the total set of greenhouse gas emissions caused by an individual, event, organisation, or product, expressed as carbon dioxide equivalent.
CARBON FOOTPRINT OF COMPLEX LOGISTICS CHAINS

absolute GHG emissions

\[
E_i = \text{CO}_2 \text{ emissions allocated to shipment by carrier } i
\]

\[
E_{\text{shipper}} = \sum_{i=1}^{n} E_i
\]

relativie emissions per activity unit

\[
KPI_{\text{supply chain}} = \frac{\sum E_i}{U}
\]

\[
KPI_{\text{logistics chain}} = \frac{\sum E_i}{U \times GCD_{o-d}}
\]

- \(U\) [tonne] or [\(m^3\)]
- \(E_1\) [kgCO\(_2\)eq.]
- \(E_2\) [kgCO\(_2\)eq.]
- \(E_3\) [kgCO\(_2\)eq.]

origin

shipper

GCD\(_1\)

GCD\(_2\)

GCD\(_3\)

destination

client
SYNCHROMODAL TRANSPORT:

EVIDENCE FOR THE CO2 REDUCTION EFFECT

CO2 per ton shipped

\(\downarrow\) CO2 % saved

CO2 per ton shipped
STATE OF THE ART

- **Carbon footprinting is mostly driven by the users of transport; LSPs support this**
  - Specific goals for reduction of carbon footprint from logistics activities
  - Logistics network optimization
  - For carriers it is a way to stand out from competition

- **Reliance on default emission factors is the first step**
  - Good for quick evaluation of the options
  - Works well for ‘average operations’
  - Challenging for fine tuning of the logistics solutions and non-standard shipments

- **Necessary data are here, processing real world data is still a challenge**
  - Freight consolidation requires determining a shipment’s share
  - Carriers generally have data on fuel use, while shippers have shipment data

- **Substantial interest in application of methodologies**
  - What drives CO2 emissions?
  - How reliable are the computation results?
  - What is the fairest way of emission allocation?
Practice Examples
Next Steps

» Standardization
  » We strongly need a commonly accepted method on emission computation and accountancy
  » ISO standard is the most preferred outcome

» Rolling out tests, cases and implementations
  » Helping organizations with carbon accountancy
  » Getting more critical mass
  » Getting businesses used to
    » Carbon footprinting
    » Support decisions evidenced by CF
NEXT STEPS: ICT

Developments towards logistic data travelling along with shipments can also be used to collect data for carbon footprinting

Getting IT systems ready for automation

• Solution for emission data exchange
• Provide sufficient protection of sensitive performance data
• Allow for a right level of aggregation
• Internalization of the results: help taking decisions on low-carbon logistics solutions
OUTLOOK: AUTOMATED SOLUTIONS

effortless, automated data collection through connected ICT systems

- primary data
- calculation methods
- information
- analyses / elaboration
- applications / knowledge

outputs exchanged between ICT systems of stakeholders

- business ICT systems

calculations performed by business ICT systems using certified tools based on standardized protocols

origin – destination tone / m³ client

fuel consumption routes vkms

comprehensive set of primary data allows generating information for a wide range of applications

Partner Logistics Bergen op Zoom
43 km hemelsbreed
Cobelfret Rozenburg

Leeds
400 m.

Mepavex Bergen op Zoom
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