

---

# GREEN LOGISTICS – ACROSS ALL MODES

Fraunhofer-Institute for Material Flow and Logistics (IML)  
Section Logistics, Traffic, Environment  
Prof. Dr.-Ing. Uwe Clausen

## The 2nd German-Arab Logistics Forum

Hamburg, 28.04.2014

---



# Eco-efficiency within logistics sector



© pa/Sven Simon



(1) UNFCCC2013; (2) BME 2009;  
(3) CDP 2011; (4) Branchenkompass 2010

- Trend: while the total greenhouse gas (GHG) emissions decreased (-8,5 %), GHG emissions increased in the logistics sector in many countries (+12,5 %) (1990-2011)<sup>(1)</sup>
- The transport and logistics sector caused approx. 20 % of GHG emissions in 2011<sup>(1)</sup> as well as further environmental impact (noise, SO<sub>2</sub>, NO<sub>x</sub>, particulate matter etc.)
- Global Players are accepting social responsibility and
  - want to promote environmental protection measures<sup>(2)</sup>
  - are actively reducing CO<sub>2</sub> emissions today<sup>(3)</sup>
  - and simultaneously reducing costs as a result<sup>(3)</sup>
  - anticipate that CO<sub>2</sub> emissions will become more expensive or affixed with prices<sup>(2)</sup>
  - demand verification of CO<sub>2</sub> emissions from their logistics service providers<sup>(4)</sup>

# The Green Logistics Project

## Project Partners



Deutsche Post DHL



FIEGE  
The World of L



ARCADIS



Wuppertal Institut  
für Klima, Umwelt, Energie  
GmbH



## Transparency & Comparability

- Development of assessment methods for the whole logistics chain
- Derivation of key figures on energy and resource consumption
- Creation of certificate for green logistics service providers

## Green Levers, Products & Services

- Conception and realization of various levers with focus on
  - Piece goods, packages, parcels
  - Road, rail and air freight

Duration: June 2010 till March 2015, funded by the Federal Ministry of Education and Research

<http://www.green-logistics-network.de/de>

# The Green Logistics Project

## Stakeholder Group



## Integration of external view

- Review of results and decisions
- Increase of data base and variety of examples and applications
- Broadening acceptance of sector guidance and certificate for logistics service providers



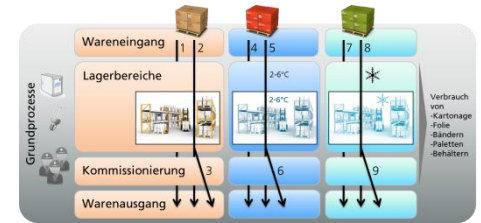
# Development of a method for the ecological assessment of the whole logistics chain



Definition of relevant processes & sub-processes of logistics services

## COMPLETENESS

GHG, SO<sub>2</sub>, NO<sub>x</sub>, CO, HC, energy noise, particulate matters, area



Transparent procedure with clear rules and criteria for definition of scope, assessment, and allocation



Corporate approach with allocation rules for environmental impact per logistics service (e.g. shipment)

## PRACTICABILITY

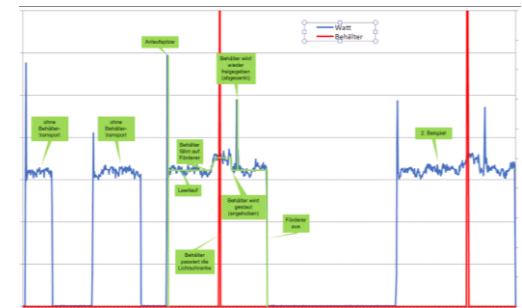
## COMPARABILITY

Reliable but pragmatic calculation of environmental impact

Recommendation for parameters and default values



Creation of comprehensive database for logistic processes



# Conception and realization of eco-efficient solutions

Electricity consumption measurements at logistics sites



Reduction of 1 Mio. kWh by investment within letter sorting (Dt. Post)

## RESOURCE EFFICIENCY

Equipment of ~14.500 swap bodies with real-time tracking system



Reduction of repositioning kilometers and stock of swap bodies



Emission tracking using on-board unit: with drivers' advice reduction of ~7% fuel consumption

## TRANSPARENCY



In-depth analysis and assessment of intermodal process chains



## ALTERNATIVE DRIVES AND DISTRIBUTION CONCEPTS

Gas drive and electric cycles within parcel delivery



Resource efficient air cargo hub (Lufthansa Cargo)

Energy savings by means of lighter load carrier in air cargo hubs (minus 10%)

# Maritime Logistics

## “Green Efforts” and its Objectives

### The Project

- The GREEN EFFORTS-Project started in January 2011 and runs until June 2014. Eight partners from industry and research are led by Jacobs University and Fraunhofer CML.

### Objectives

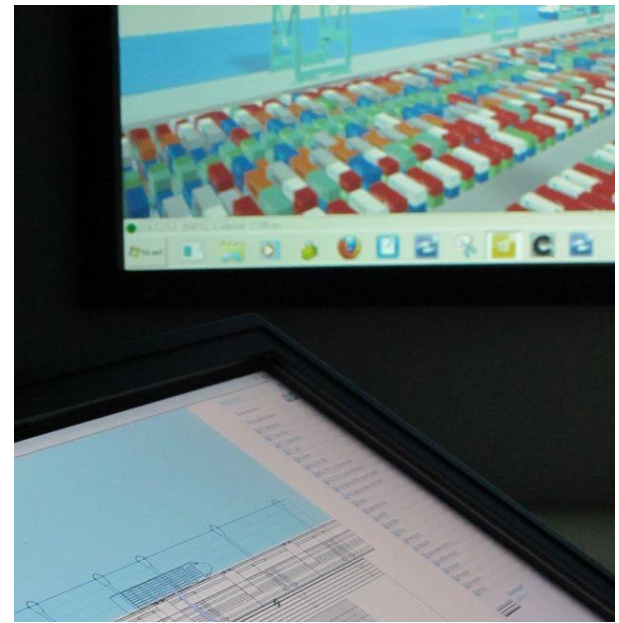
- Call attention to energy consumption and its effects on the environment and economy
- Investigate the current energy mix in ports and terminals
- Investigate the range of regenerative energy sources applicable on terminals



[www.green-efforts.eu](http://www.green-efforts.eu)

# Outcome

- Port and Terminal Knowledge Landscape (PTKL)
- Carbon footprint calculation methods for port and terminal domains
- Simulation model for terminal energy consumption and supply





# PTKL (developed by Fraunhofer CML)

- Port and Terminal Knowledge Landscape allows virtual journeys through RoRo-, Container- and Inlandwaterway-Terminals
- Underlying information charts give immediate access to crucial information such as energy consumption, emissions and alternatives in equipment or energy use
- The PTKL is point of origin when it comes to setting up an energy management system that aims to combine production and use of renewable energies like wind and solar power on terminals



# Thank You!



**Prof. Dr.-Ing. Uwe Clausen**

Director,

Fraunhofer-Institute for Material Flow and Logistics (IML), Dortmund  
& Institute of Transport Logistics, TU Dortmund

Chairman, Fraunhofer Transport Alliance, Germany

Phone: +49 231 97 43 400

Email: [Uwe.Clausen@iml.fraunhofer.de](mailto:Uwe.Clausen@iml.fraunhofer.de)

Homepage: <http://www.iml.fraunhofer.de>