







Green Logistics

Comparability of the Environmental Effects of Logistics Services

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Green Logistics – Partners & Project goals



Project: 2010-2015 (<u>www.green-logistics-network.com</u>)

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Background & Initiatives



The »Green Logistics« approach for sector guidance

- // Identification of relevant processes and sources of emissions from logistics services
- // Definition of relevant emission categories:
 - Transport (all modes): freight transport, provision of transport means & containers, ...
 - Logistics sites: intralogistics, material consumption, real estate, ...
 - System-wide sources: administration, commuting, business travel
- // Definition of relevant environmental effects:
 - CO_2e , energy, SO_2 , NOx, CO, HC
 - Noise, land consumption, particulate matters



Requirements



Central requirements for »Green Logistics« approach

- 1. Realization of comparable results for comparable logistics services
 - Step 1: Screening and definition of assessment scope
 - Step 2: Ecological assessment of logistics service
- 2. Meaningful results and applicability for large as well as for small companies
 - Assessment of Scope 1, 2 and 3 (i.e. own and subcontracted processes)
 - Use of real process data \rightarrow "close to reality"
 - Use of default values \rightarrow "simplifications if reasonable"
- 3. Definition of comprehensive set of relevant default values
 - Alignment with existing data bases & current initiatives
 - Development of new parameters e.g., at logistics sites (warehousing, transshipment), for auxiliary processes



Identification of assessment scopes for logistics services (»system definition«)



Recommendation of industrial partners

Relevance analysis by means of detailed studies, model calculation and literature study

Relevant:

- General significance
- Option for differentiation
- Potential for optimization
- Requirements of market and legislation

Not relevant:

- Today's availability of data within
 - Companies
 - Public databases

Relevant emission sources for the comparison of different logistics services (and companies)



// Road transport



// Rail transport



// Maritime transport



- // Inland waterway
 transport
- // Air transport



// Logistics nodes



// Administration



// Employee commuting



Business trips

- All means of transport and legs (company-owned & external vehicles)
- Direct emissions of vehicle propulsion and ancillary services and emissions of leakage (additives, refrigerants) for all loaded and empty trips made by each vehicle
- Indirect emissions of production/ provision of fuels, vehicles and infrastructure
- All warehouses and transshipment centers for the goods handling [storing, conveying, packaging, ...] (company-owned & external)
- Direct emissions of engines (e.g., yard logistics)
- Indirect emissions of the purchase/provision of fuels, energies and auxiliaries (e.g., packaging materials)
- Indirect emissions for the production of logistics facilities
- Energy consumption (e.g., electricity, heating)
- Direct emissions of regular travel between one's place of residence and place of work
- Direct emissions of company-specific business travels



Green Logistics Method



Certification⁽¹⁾

Green

LS = Logistics service; OU = Organizational unit; CL = Client; Geo = Geographical unit

MJ = Mega joule; $CO_2e = CO_2$ -equivalents; NO_x = Nitrogen oxides; SO₂ = sulfur dioxide; CO = carbon monoxide; HC = hydro carbons

Definition of calculation approach



- // The »Green Logistics Method« defines minimum standard, higher levels of detail are optional
- // Reasons for a more detailed approach (i.e. more company-specific) e.g.,
 - Detailed objectives of assessment results and reporting (e.g., for customers)
 - Requirements of stakeholders/shareholders
 - Access to activity data
 - Monitoring of improvement measurements/results



Screening phase (1st step), definition of assessment scope

LS 2

LS n

// Fictional example

Logistics service provider (LSP)

Chap 4								
Step I	Emission categories ⁽¹⁾		Relevance Share		Share (acc.)	?		
	al int	987 kg CO ₂ e		29,8 %	100,0 %	\checkmark		
	al ext	876 kg CO ₂ e		26,4 %	70,2 %	\checkmark		2 nd step
 a. General check of relevance b. Emission calculation by means of industry-average values 	🔹 int	765 kg CO ₂ e		23,1 %	43,8 %	\checkmark		
		654 kg CO ₂ e		19,7 %	20,8 %	\checkmark		
		23 kg CO ₂ e		0,7 %	1,1 %	×		less relevant
		12 kg CO ₂ e	V	0,4 %	0,4 %	×		
	LS	3.317 kg CO ₂ e		100 %				
average values	Threshold rule- less than 1 % - sum less than 5 % of total emissions							
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LS 1

Allocation model (simplified)



Declaration and certification (optional)



- // Standardized blank form for result declaration currently under development
 - Developed by TÜV Rheinland and industrial partners
 - Consensus needed between requirements of industries and certification process
- // General agreement
 - Testifying correct use of methodology
 - Embedded in existing environmental schemes (DGNB, ISO 14001, EMAS etc.)
 - Share of real activity data (to be valid as of 2020)
 - 80 % approach A/B for all scopes 1-3
 - Max. 20 % approach C
 - Declaration of values for continuous development of industry-averages (needed in approach C)



Development of comprehensive approach: Guidance and industry examples

- // Electricity measurements at logistics nodes
 - Container terminals (ship/rail/road)
 - Warehouses, parcel/letter distribution centers
- // Screening phase (Step 1)
 - Definition of assessment scopes for logistic networks
- // Calculation of emissions on basis of approach A, B & C and allocation of emissions on client/customer level
 - Country networks
 - Spotlights at warehouses
- // Development of parameters and key figures (examples)
 - Pre/on-haulage for combined transport
 - Intralogistics processes
 - LCA of building shells



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Conclusions

- // Green Logistics method further develops existing approaches of ecological assessment for logistic systems
 - All relevant processes are covered (transport, transshipment, storage)
 - Additional environmental effects are included (e.g., local air pollutants)
 - Complete yet pragmatic approach is outlined (2-step approach)
- // Still, alignment and consolidation of current activities is necessary and started in Green Logistics. This includes
 - Methodological approaches
 - Data sets for default values



- Further reading (English)
- Dobers et al. (2014): Comparability of the Environmental Effects of Logistics Services - Sector Guidance for Ecological Assessments, TRA 2014, Paris, 2014
- Dobers et al. (2013): Green Logistics: Comparability of the Environmental Effects of Logistics Services, Springer Verlag, Berlin, 2013











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