Global Partner for a Sustainable World

DEKRA

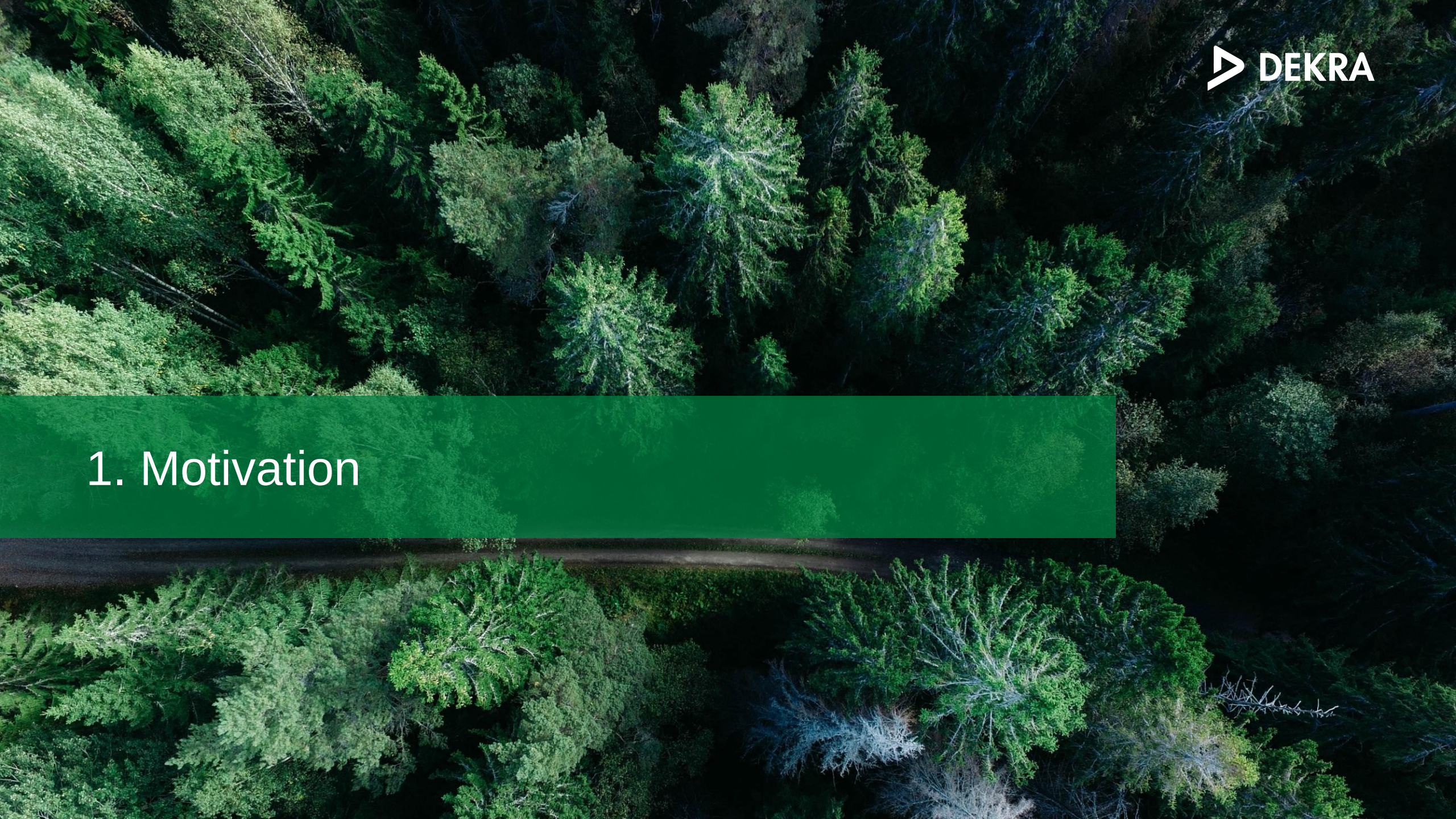
EU Green Week Webinar

How to achieve climate neutral logistics

AGENDA

Carbon neutral logistics: How can it be defined and how can it be accomplished?

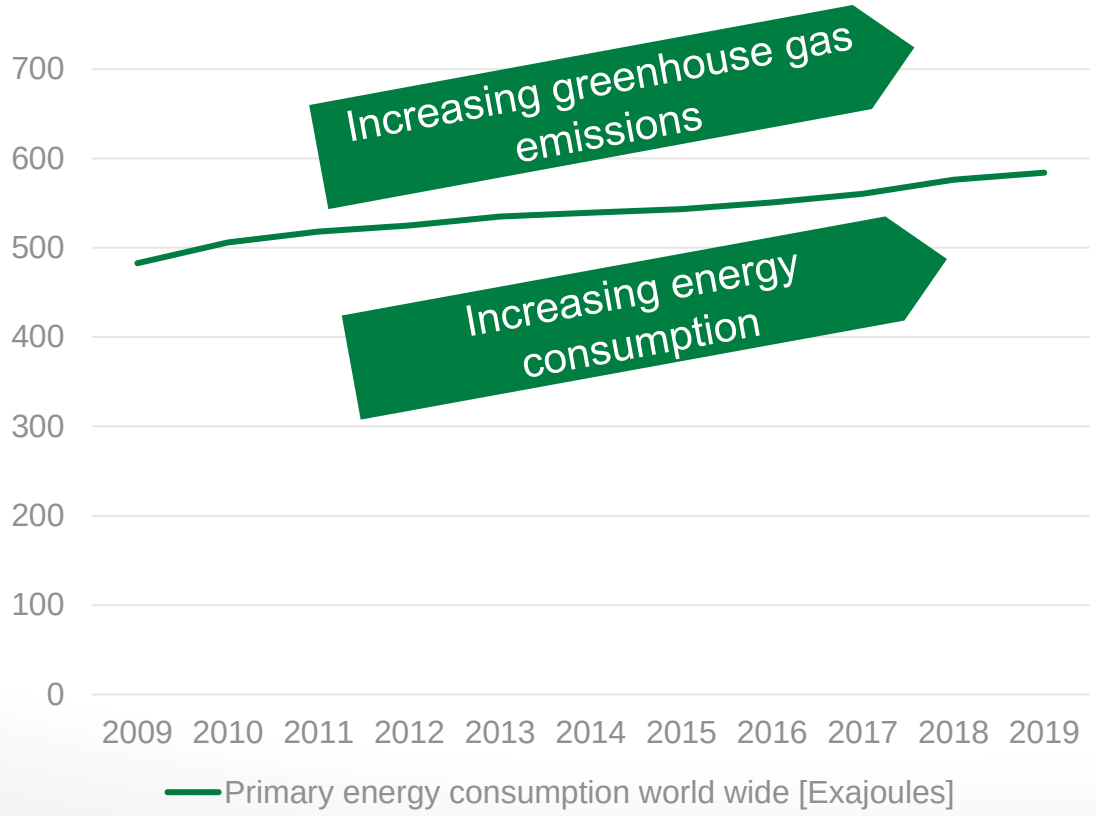
1. Motivation
2. General framework
3. Calculating a carbon footprint
   - 3.1 Corporate carbon footprint
   - 3.2 Carbon footprint of transportation services
4. Accomplishing climate neutrality



1. Motivation

1. MOTIVATON

International increase in primary energy consumption



Source: own illustration with data from BP-Report (Statistical Review of World Energy 2020)

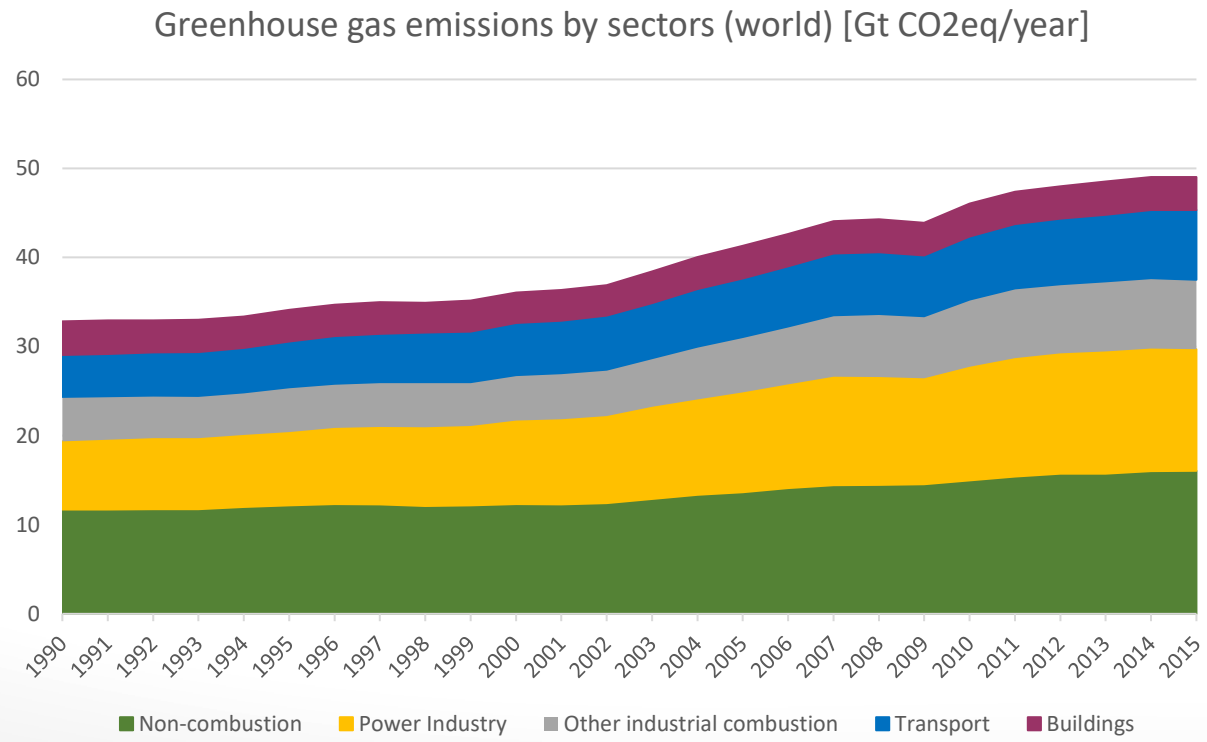
- Climate models of the United Nations expert panel (Intergovernmental Panel on Climate Change, IPCC)
- Definition of a CO2 residual budget for **1.5°C target**
- **Current interim status (June 2021):**
  - **Residual budget: approx. 276 gigatons**
  - **Residual time: < 7 years**

https://www.mcc-berlin.net/forschung/co2-budget.html

Source: Mercator Institut für globale Gemeinschaftsgüter und Klimawandel

1. MOTIVATON

- **international increase in transport emissions**



Transport

Source: own illustration with data from European Commission, Joint Research Centre (JRC)/Netherlands Environmental Assessment Agency (PBL). Emission Database for Global Atmospheric Research (EDGAR), available at https://edgar.jrc.ec.europa.eu/country_profile

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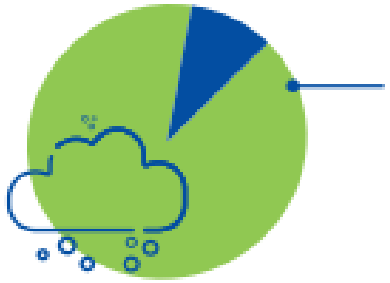
1. MOTIVATON

Their CO_2 emissions are currently not completely avoidable.

➡ **But: Reduction approach required!**

- Logistics industry as a driver of highly developed economies
- Freight transport as the basis for supplying industry, trade and the population
- Greenhouse gas emissions as a measure of “green” logistics activities
  - ➢ **Greenhouse gas balance as a basis for decision-making**
  - ➢ **Identify key emission drivers**
  - ➢ **Implement preventive measures**
  - ➢ **Securing competitive advantages**
- DIN EN 16258 standard
  - ➢ **Accuracy, transparency, uniformity**

Goal: Climate Neutrality in EU until 2050



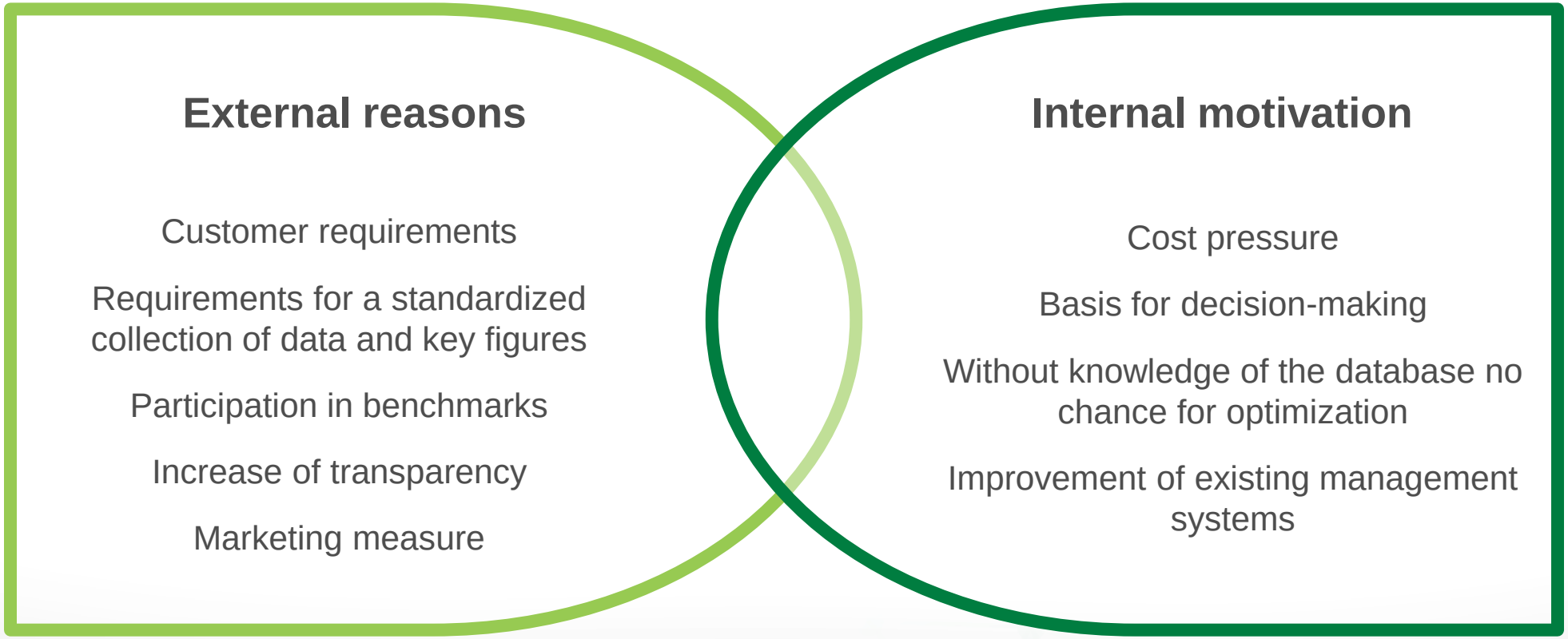
90% reduction greenhouse gas emissions in transport by 2050

Source: The European Green Deal – Sustainable Mobility. Available at: Sustainable_mobility_en.pdf.pdf

Interactive survey I

1. MOTIVATON

Why carbon accounting?



2. General Framework

2. GENERAL FRAMEWORK

Which carbon footprint?

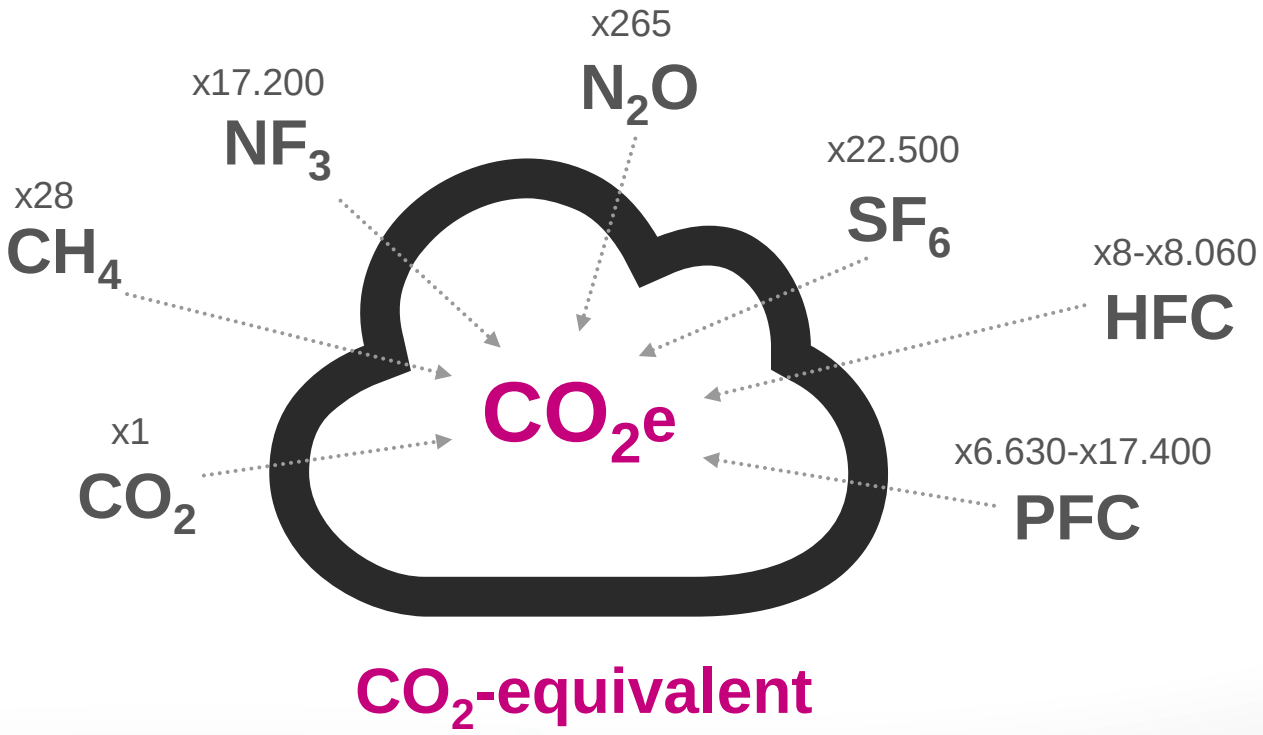
Product	Corporation	Project
PCF = Product Carbon Footprint	CCF = Corporate Carbon Footprint	
▪ Determination of the climate impact of a specific product ▪ Consideration of the entire life cycle from raw material to recycling or disposal	▪ Determination of the climate impact of a company ▪ Consideration, assessment and management of emissions within defined system boundaries	▪ Determining the climate impact of specific projects ▪ Consideration of: – Services (e.g. transportation), – Events, – Sub-project, etc.

Part of the webinar

2. GENERAL FRAMEWORK

Greenhouse gases

- Defined by United Nations expert panel (Intergovernmental Panel on Climate Change, IPCC)
- Different impacts in the atmosphere (global warming potential)
- Unit of measurement for comparison (CO2 equivalents)



*Source GWP: The Intergovernmental Panel on Climate Change (IPCC)

3. CALCULATING A CARBON FOOTPRINT

3.1 Coporate Carbon Footprint (CCF)

3. CALCULATING A CARBON FOOTPRINT

3.1 Corporate Carbon Footprint

Step 1

Target definition

- Define system boundary
- Define scopes (materiality analysis)
- Use of existing data (management systems ISO 14001, ...)

Step 2

Data collection

- Check plausibility of data basis
- Research emission factors
- Definition of uncertainty factor

Step 3

Carbon accounting

- Calculation of Greenhouse Gas Footprint
- Generate report of results
- Define Key Performance Indicators (KPI)

Step 4

Implement measures

- Identify reduction potentials
- Define measures
- Verify result
- Communication

3. CALCULATING A CARBON FOOTPRINT

3.1 Corporate Carbon Footprint

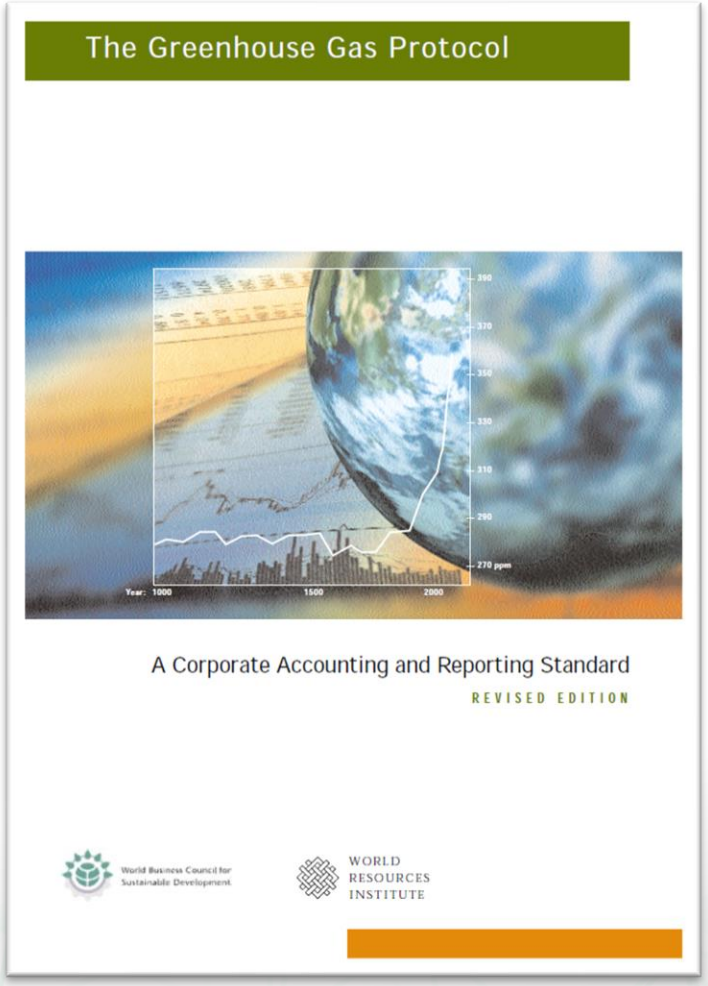
The Greenhouse Gas Protocol in general

- is a multi-stakeholder partnership, that brought together governments, NGOs and businesses.
- Stakeholders were convened by the World Resources Institute (WRI), a U.S.-based environmental NGO, and the World Business Council for sustainable development (WBCSD).
- The initiative established a greenhouse gas accounting and reporting standard for businesses, which is today broadly applied and internationally accepted.

Full Greenhouse gas Protocol document can be accessed via:

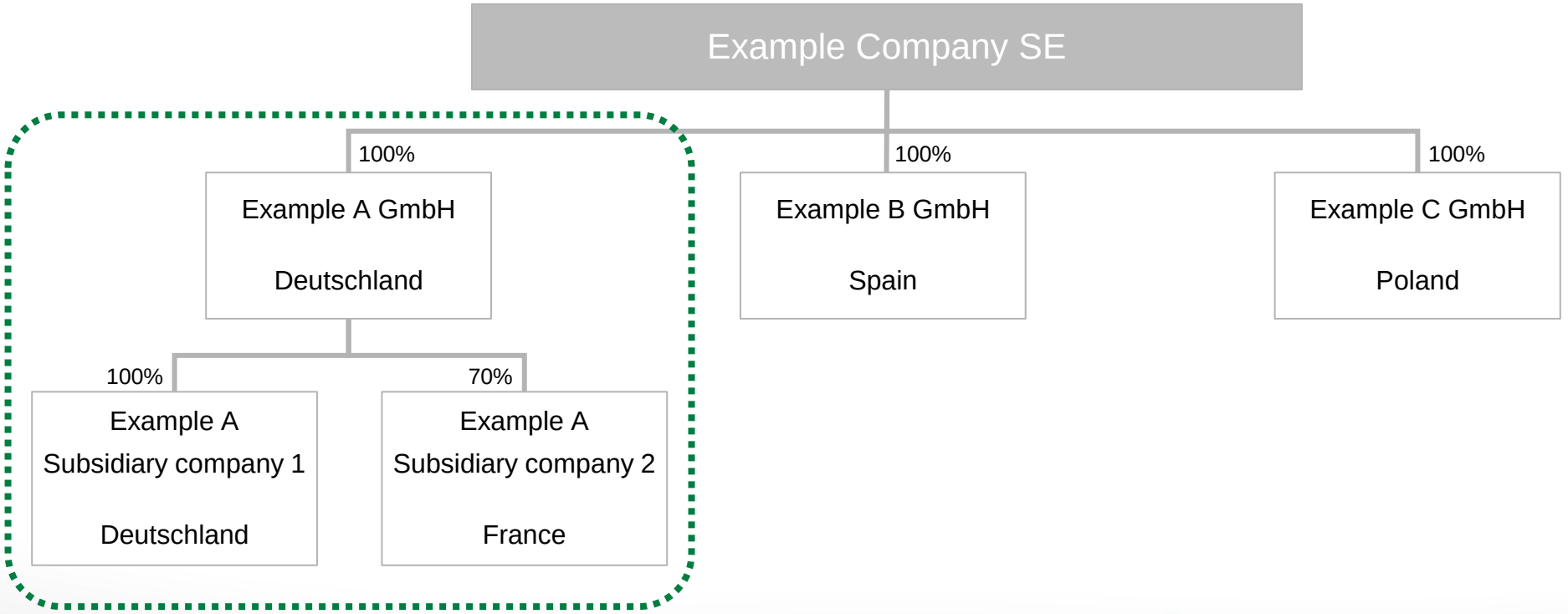
https://ghgprotocol.org/corporate-standard

→ It‘s available in different languages!



3. CALCULATING A CARBON FOOTPRINT

3.1 Corporate Carbon Footprint



Define system boundary

3. CALCULATING A CARBON FOOTPRINT

3.1 Corporate Carbon Footprint

Scopes according to the Greenhouse Gas Protocol

Scope 1 Emissions

include all **direct** greenhouse gas emissions resulting from a company's own business activities. These therefore include emissions from the consumption of primary energy sources as well as process emissions that occur during the production process.

Scope 2 Emissions

include the **indirect** greenhouse gas emissions resulting from the generation of energy procured by a company; e.g. emissions from the generation of electricity or district heating.

Scope 3 Emissions

include all other indirect greenhouse gas emissions that occur in the upstream and downstream supply chain; e.g. emissions from the manufacture and delivery of the products used by the company.

Examples

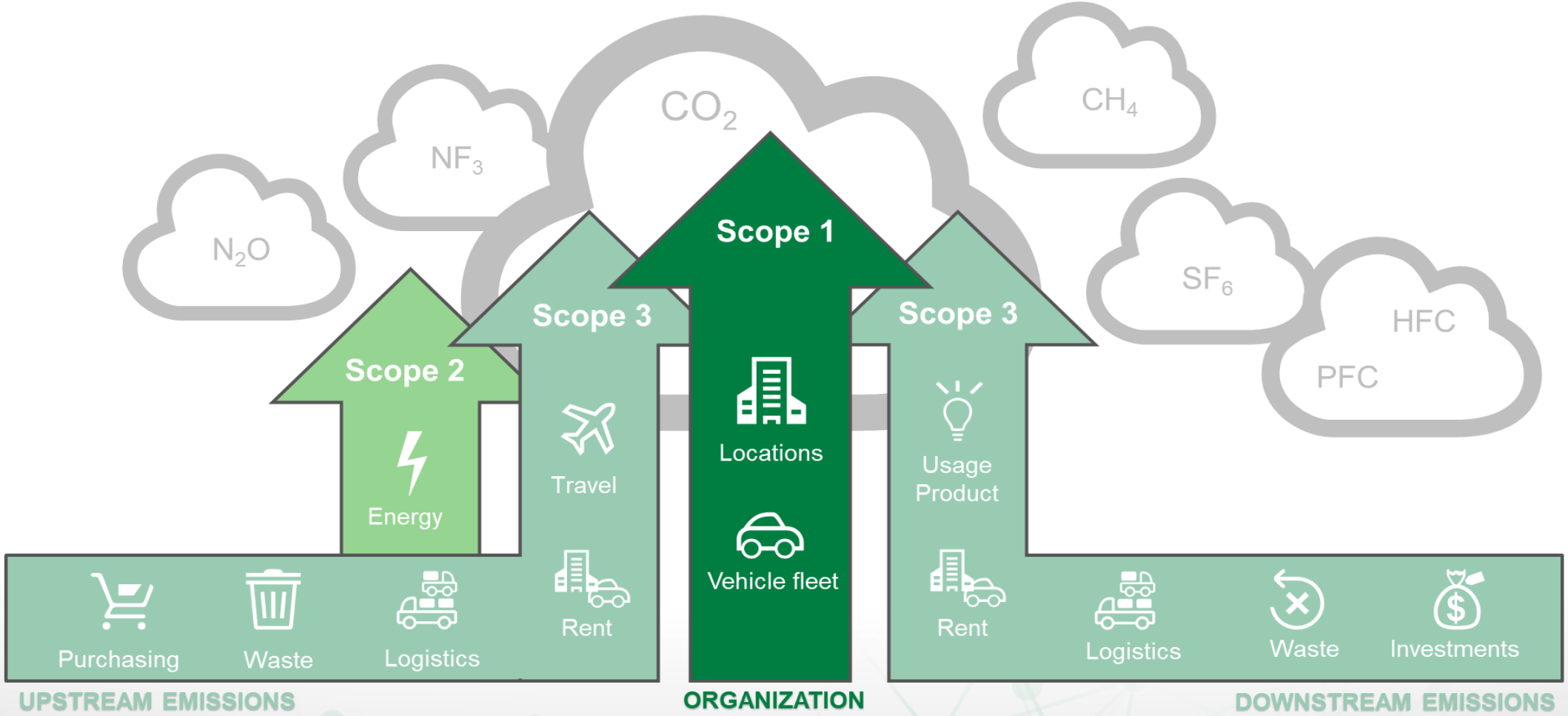
Location, Fleet

Electricity, District Heating

Procurement, Waste, Logistic, Travel

3. CALCULATING A CARBON FOOTPRINT

3.1 Corporate Carbon Footprint



Scopes according to the Greenhouse Gas Protocol
(figure shows examples)

3. CALCULATING A CARBON FOOTPRINT

3.1 Corporate Carbon Footprint

The accounting process

Actions in all scopes x **emission factor** [kg CO_2e / unit] = **Carbon footprint** [kg CO_2e]

Organizational Boundaries

3. CALCULATING A CARBON FOOTPRINT

3.1 Corporate Carbon Footprint

The accounting principles

- RELEVANCE
- COMPLETENESS
- CONSISTENCY
- TRANSPARENCY
- ACCURACY

3. CALCULATING A CARBON FOOTPRINT

3.2 Carbon footprint of transportation services

3. CALCULATING A CARBON FOOTPRINT

	Standards	System boundary	KPIs	Scopes	Allocation
3.1 Corporate Carbon Footprint					
	Greenhouse Gas Protocol (GHG-P)	Financial control / Operational control	Greenhouse gases (CO2e)	Scope 1, Scope 2, (Scope 3)	no
3.2 Carbon footprint of transportation services					
	DIN EN 16258	Entire transport chain (own vehicles / subcontractors)	Greenhouse gases (CO2e) / Energy consumption	TTW*, WTW**	physical variables

*Tank-to-Wheel Emissionen | ** Well-to-Wheel Emissionen

3. CALCULATING A CARBON FOOTPRINT

3.2 Carbon footprint of transportation services

Contents of DIN EN 16258

- Development of a standardized method for calculating and labeling the energy consumption and greenhouse gas emissions of transports

  → Stationary units (Locations) of the company are not considered in this standard

- Definition of requirements for declaration, system boundaries as well as allocation rules

- Recommendations of data sources

3. CALCULATING A CARBON FOOTPRINT

3.2 Carbon footprint of transportation services

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- All modes of transport
- Sum of all partial distances (legs)
- Total fuel consumption
- Empty trips included
- Greenhouse gas emissions and energy consumption

3. CALCULATING A CARBON FOOTPRINT

3.2 Carbon footprint of transportation services

Accounting steps of DIN EN 16258

1

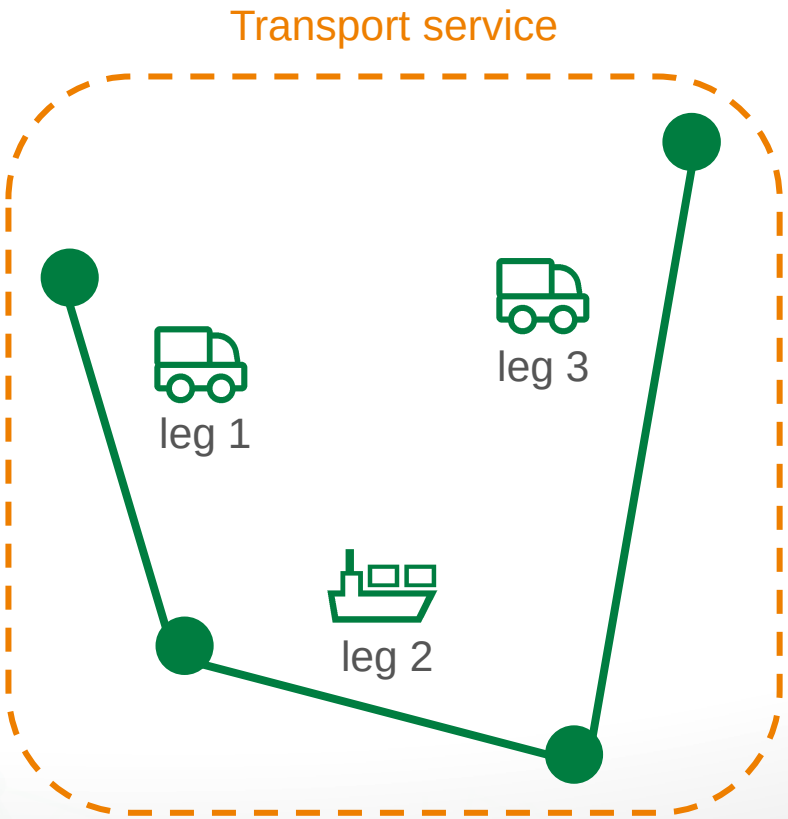
Definition of partial distances (legs)

→ Identification of the used modes of transport for the transportation service

→ Division into sections without change of the used modes of transport

2

3



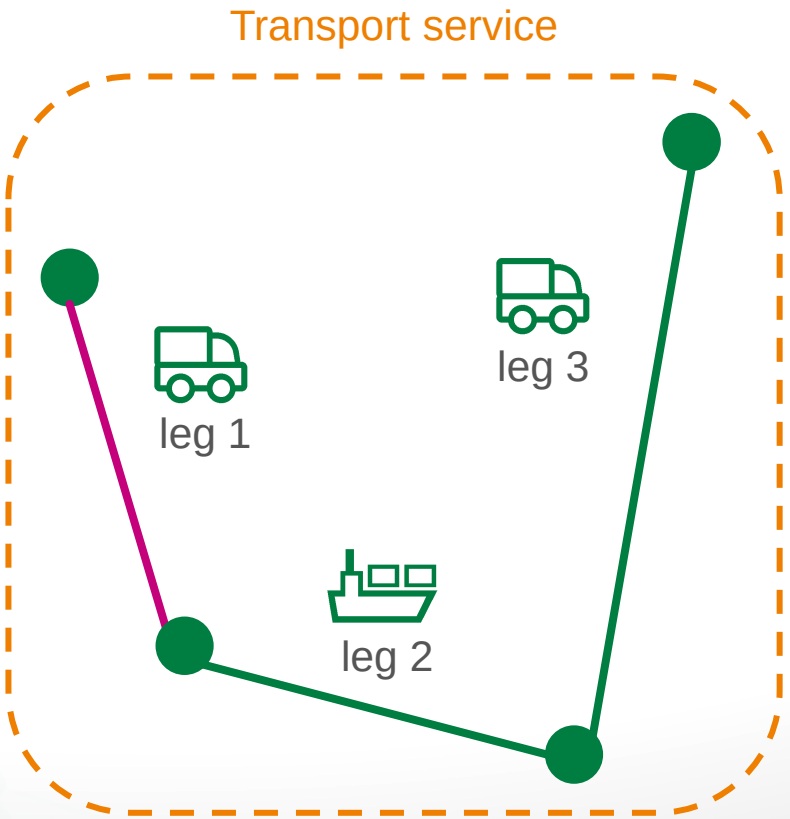
Source: own illustration according to DSLV and DIN EN 16258

3. CALCULATING A CARBON FOOTPRINT

3.2 Carbon footprint of transportation services

Accounting steps of DIN EN 16258

1. **Definition of partial distances (legs)**
   - → Identification of the used modes of transport for the transportation service
   - → Division into sections without change of the used modes of transport
2. **Calculation of energy consumption and greenhouse gas emissions per partial distances (legs)**
   - → Definition of a Vehicle Operation System (VOS) per leg
   - → Identification of the energy consumption
   - → Determination of key performance indicators
   - → Allocation to transport service
3.



Source: own illustration according to DSLV and DIN EN 16258

3. CALCULATING A CARBON FOOTPRINT

3.2 Carbon footprint of transportation services

Accounting steps of DIN EN 16258

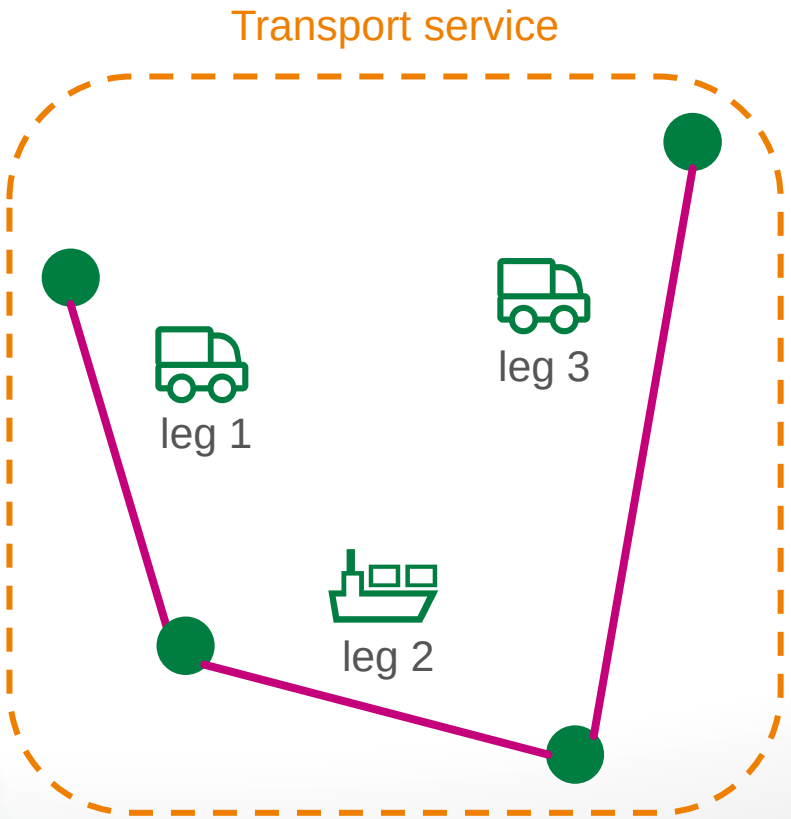
1 **Definition of partial distances (legs)**

- → Identification of the used modes of transport for the transportation service
- → Division into sections without change of the used modes of transport

2 **Calculation of energy consumption and greenhouse gas emissions per partial distances (legs)**

- → Definition of a Vehicle Operation System (VOS) per leg
- → Identification of the energy consumption
- → Determination of key performance indicators
- → Allocation to transport service

3 **Totalization of the entire partial distance results**



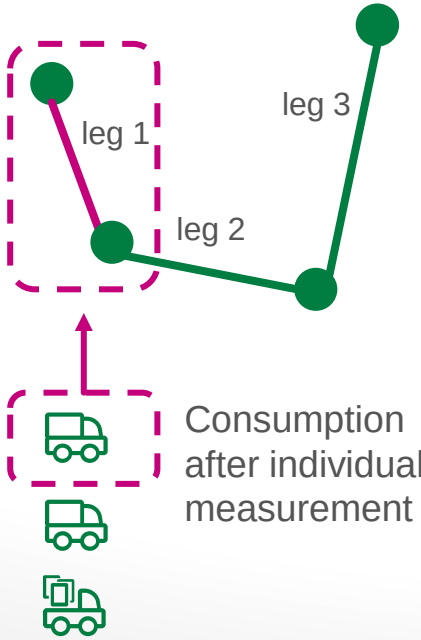
Source: own illustration according to DSLV and DIN EN 16258

3. CALCULATING A CARBON FOOTPRINT

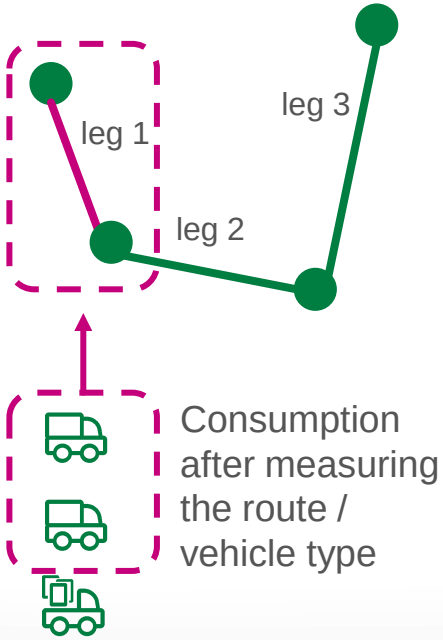
3.2 Carbon footprint of transportation services

Determination of the energy use of a defined Vehicle Operation System (VOS) per leg according to...

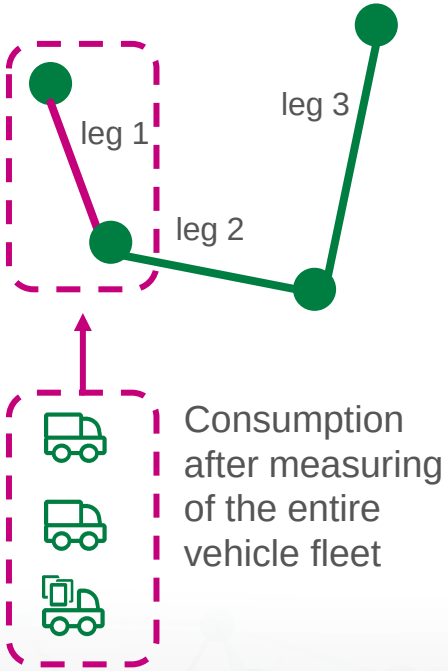
...single measured value.



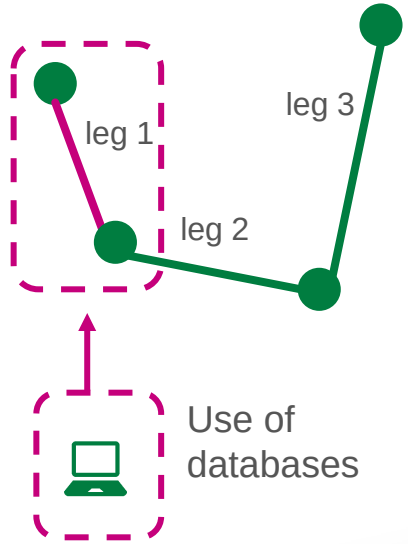
…specific value.



…Fleet value.



…Default value.



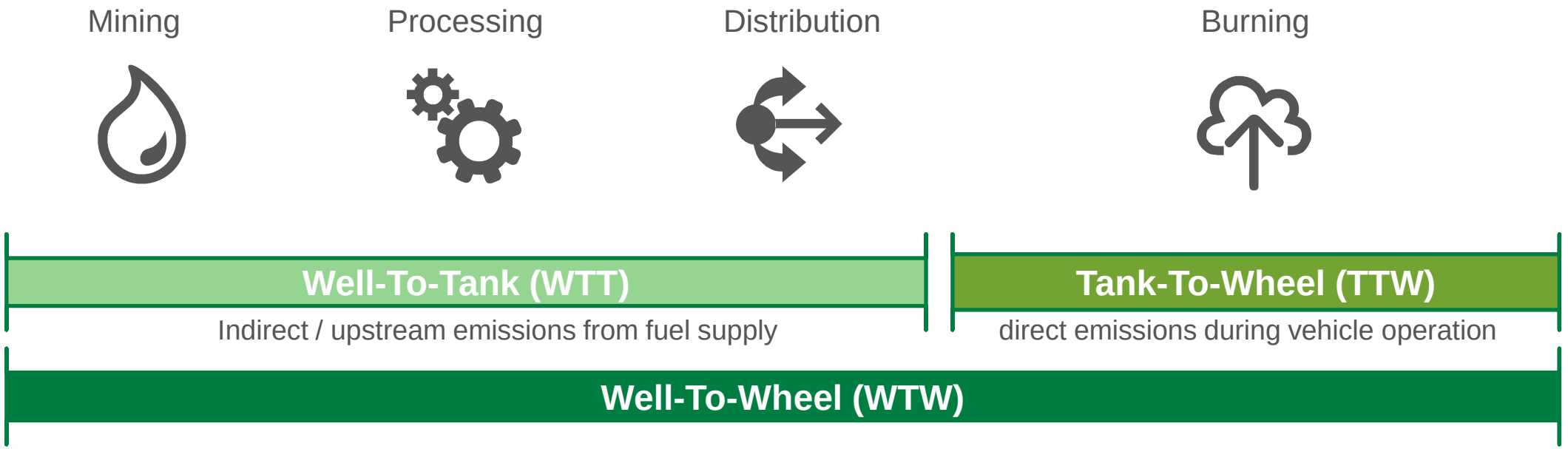
Decrease in data quality

Source: own illustration according to DSLV and DIN EN 16258

3. CALCULATING A CARBON FOOTPRINT

3.2 Carbon footprint of transportation services

Determination of Key Performance Indicators (KPI) according to DIN EN 16258



Four Key Performance Indicators (KPI) must be recorded for energy consumption and greenhouse gas emissions:

- **TTW-** and **WTW-Energy consumption** (MJ)
- **TTW-** and **WTW-Greenhouse gas emissions** (CO_2e)

3. CALCULATING A CARBON FOOTPRINT

3.2 Carbon footprint of transportation services

Determination of Key Performance Indicators (KPI) according to DIN EN 16258

90 liters of Diesel

Conversion factors DIN EN 16258

TTW-Energy Counsumption: **3.231 MJ**
WTW-Energy Counsumption : **3.843 MJ**

TTW-Greenhouse Gas Emissions: **240 kg CO_2e**
WTW-Greenhouse Gas Emissions : **292 kg CO_2e**

Table A.1 — Transport fuels: density, energy factor and GHG emission factor

	Density (d)	Energy factor				GHG emission factor					
		Tank-to-wheels (e_t)		Well-to-wheels (e_w)		Tank-to-wheels (g_t)			Well-to-wheels (g_w)		
Fuel type description	kg/l	MJ/kg	MJ/l	MJ/kg	MJ/l	gCO_2e/MJ	$kgCO_2e$/kg	$kgCO_2e$/l	gCO_2e/MJ	$kgCO_2e$/kg	$kgCO_2e$/l
Ethanol	0,794	26,8	21,3	65,7	52,1	0	0	0	58,1	1,56	1,24
Gasoline/Ethanol blend 95/5	0,747	42,4	31,7	51,4	38,4	72,6	3,08	2,30	88,4	3,74	2,80
Diesel	0,832	43,1	35,9	51,3	42,7	74,5	3,21	2,67	90,4	3,90	3,24

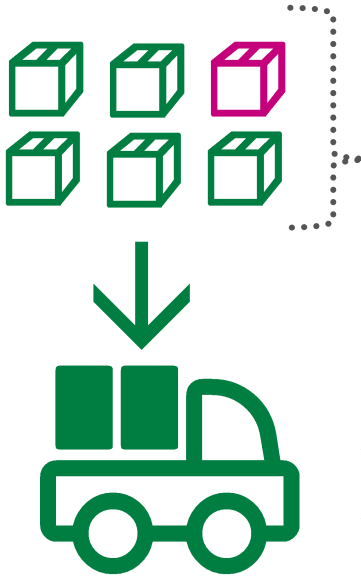
Source: DIN EN 16258

3. CALCULATING A CARBON FOOTPRINT

3.2 Carbon footprint of transportation services

Allocation - splitting of energy consumption and greenhouse gas emissions to individual goods.

- Allocation method must be constant
- Special rules for round trips exist
- Allowed units:
  - → Ton kilometers (Tkm) as primary unit
  - → Other units only with special reason (pallets, volume, loading meters, etc.)



Specific pallet weight: 3t

Cargo weight (total): 10t

Allocation pallet: 1 pal. (spec.) / 6 pal. (total) = 16%

Allocation mass: 3 t (spec.) / 10 t (total) = 30%

3. CALCULATING A CARBON FOOTPRINT

3.2 Carbon footprint of transportation services

Overview DIN EN 16258

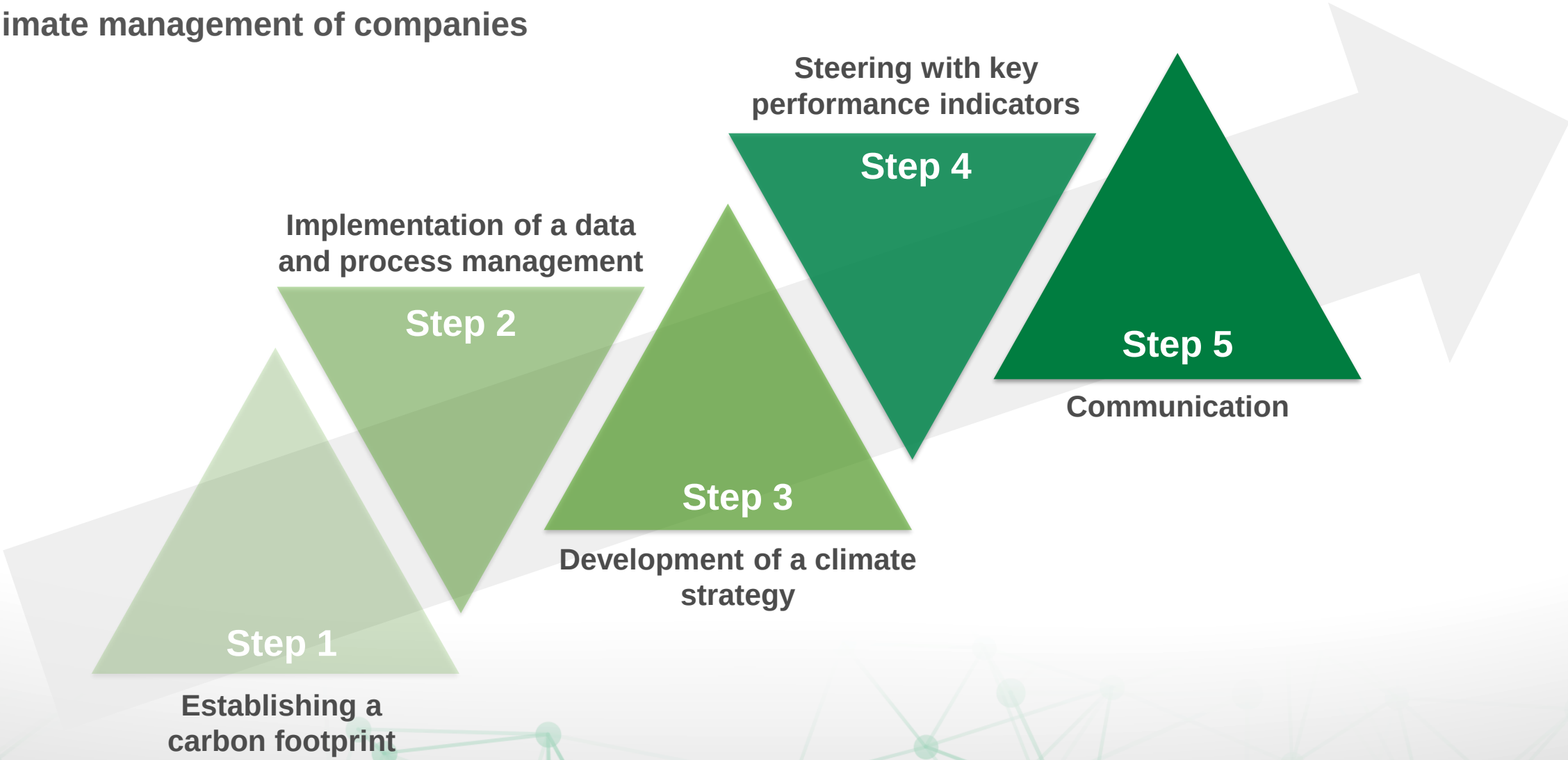
- **Process standard for greenhouse gas accounting of transportation services**
  - → Definition of requirement for system boundary
  - → Recording of all modes of transport used
- **Calculation of energy consumption (MJ) and greenhouse gas emissions (CO2e)**
  - → Specification of energy and greenhouse gas factors for the calculation of the carbon footprint given
  - → Definition of allocation parameters for the splitting of the carbon footprint given
- **Advantage in competition with other companies**
  - → Customer of transport service can classify service to own climate targets
  - → Own reduction measures and own climate targets can be achieved

Interactive survey II

4. Accomplishing Carbon Neutrality

4. CLIMATE NEUTRALITY

Climate management of companies



4. CLIMATE NEUTRALITY

Process steps

→ **DIN EN 16258** as part of your overall carbon footprint!
(Logistics services)

Data collection

1

- Start meeting for the definition of required documentation
- Description of the data that will be used for the collection, documentation and processing of

Assessment CO_2e Balance

2

- Verification of GHG emissions for Scope 1-3 according to Greenhouse Gas Protocol
- Examination of the procedures for the definition of the **inventory boundary** and emission sources
- Review of data basis, calculation factors and existing uncertainties
- Certificate according to Greenhouse Gas Protocol

Confirmation climate neutrality

3

- Analysis of the **reduction measures** implemented (methodology as well as type, quantity and time period of the greenhouse gas emissions saved)
- Analysis of the implemented **compensation measures** (type, quantity and time period as well as retirement of allowances)
- *Validation according to PAS 2060 (additionally possible)*

Time for questions

Your personal contact

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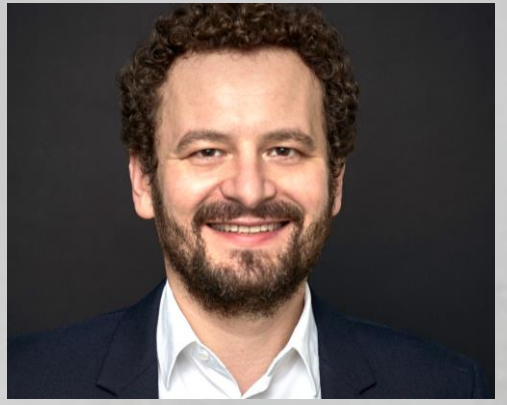

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