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Product Carbon Footprint | How-to Guide

For further information see also: One Pager, ISO 14067 and GHG Protocol

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Schaeffler AG

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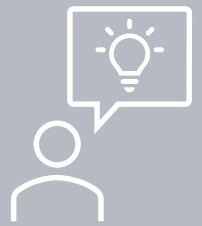
What is a Product Carbon Footprint?

Product Carbon Footprint (PCF) =
The sum of the total GHG emissions generated over the different stages of a product‘s life cycle.

1 **Definition and Goals**

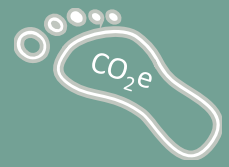
2 **Application and Benefits**



3 **Calculation Process**

4 **Exemplary Tools**

5 **Outcome**



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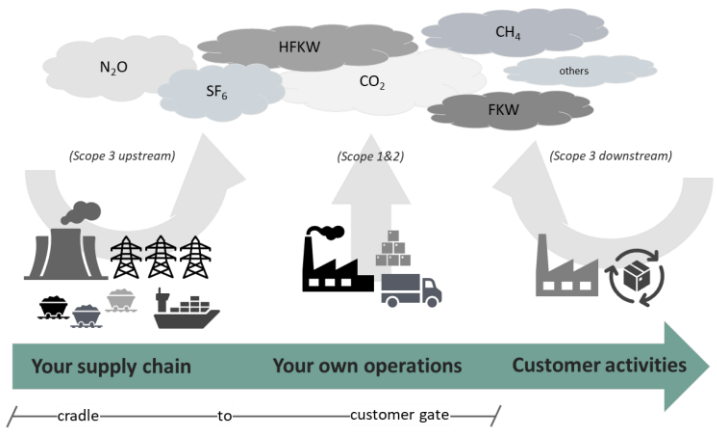
What are the characteristics of a Product Carbon Footprint?

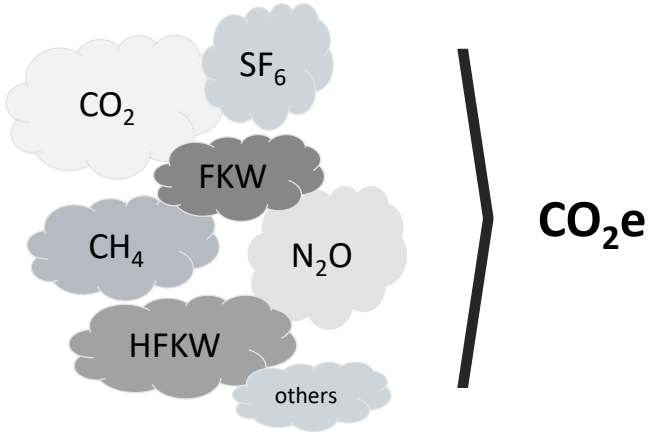
Product-specific

- Systematical analysis of the climate impact of a projected product over the defined life cycle stages
- Setting of system boundaries in accordance with the requested target



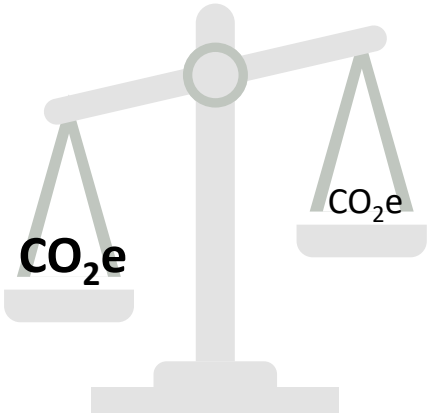
Climate-related

- Calculating product-related Greenhouse Gas emissions (GHG) in [kg CO2 equivalents]
- Matching of all product-specific activity and consumption data with assigned emission factors



Reduction-oriented

- Quantitative bottom-up approach to evaluate the climate impact of a product
- Analysis hotspots within your value chain
- Evaluation climate related data
- Mitigation climate impact of products



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Integrate PCF into your environmental management measures

Application

- **Reporting:** Use PCF data in sustainability reporting
- **Benchmarking:** Compare product performance with peers and database values
- **Monitoring:** Track product performance in terms of climate
- **Optimizing:** Identify and mitigate main contributors to climate impact
- **Value proposition:** Demonstrate your sustainability efforts

For more detailed information see GHG Protocol (e.g., chapter 11)

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Identify and optimize resource handling and production processes

Benefits

- Create **transparency** and increased **system understanding**
- Fact based **decision-making** for production and sourcing process
- Raise **awareness** of GHG emissions along value chain
- Develop product and climate **strategies**
- Reliable **communication and marketing**

For more detailed information see GHG Protocol (e.g., chapter 11)

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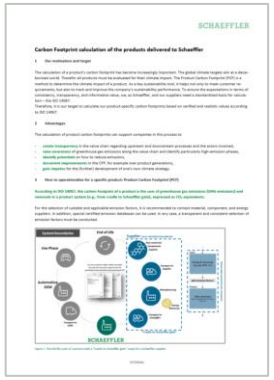
What are relevant prerequisites for PCF calculation?

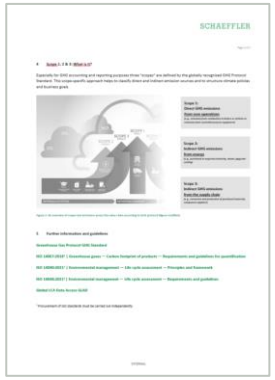
Completeness

Evaluate every single component and all relevant production steps

Framework

Data collection shall be in accordance with ISO 14067





See One Pager “Carbon Footprint Calculation“

Support

For help regarding calculation methodology see GHG protocol website and SBTI Guidelines.

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Take standardized steps to calculate PCF according ISO 14067

1. Goal & Scope definition

Define product under scrutiny, objectives of evaluation, system boundaries and audience (internal/external)

→ **Define system boundaries**

2. Data collection

Investigate and create a list of all relevant inputs and outputs associated with the product

→ **Analyze relevant activity data (e.g., kWh, m^3)**

3. Impact Assessment

Use specific emission factors to match with your activity data for the PCF calculation

→ **Calculate the Product Carbon Footprint**

4. Evaluation & Interpretation

Identify opportunities of reducing negative environmental impacts in the product‘s life cycle

→ **Validate and report results**

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Carry out data collection to calculate the PCF

Every single component and production step needs to be evaluated.

1 **Raw Materials**
(e.g., steel, plastics, grease)

2 **Energy Carriers**
(e.g., electricity, natural gas)

3 **Transport**
(e.g., truck, cargo ship, packaging)

4 **Operating Resources**
(e.g., lubricants, oils, emulsion)

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Calculate the PCF by matching activity data with emission factors

	Activity data* from own data collection		Emission factors* from literature and databases
Raw Materials	Steel: 4 kg Plastic: 1 kg	〉	2 kg CO_2e / kg Steel 5 kg CO_2e / kg plastic
Operating Resources	Turning oil: 0,5 kg Grinding oil: 0,1 kg	〉	1 kg CO_2e / kg turning oil 2 kg CO_2e / kg grinding oil
Energy Carriers	Electricity: 10 kWh Natural gas: 8 kWh	〉	0,8 kg CO_2e / kWh 0,2 kg CO_2e / kWh
Transport	Truck transport: 120 kgkm Cargo ship transport: 2500 kgkm	〉	0,2 kg CO_2e / tkm 0,1 kg CO_2e/ tkm

Activity data × Emission factors = Product Carbon Footprint

* Fictious figures!

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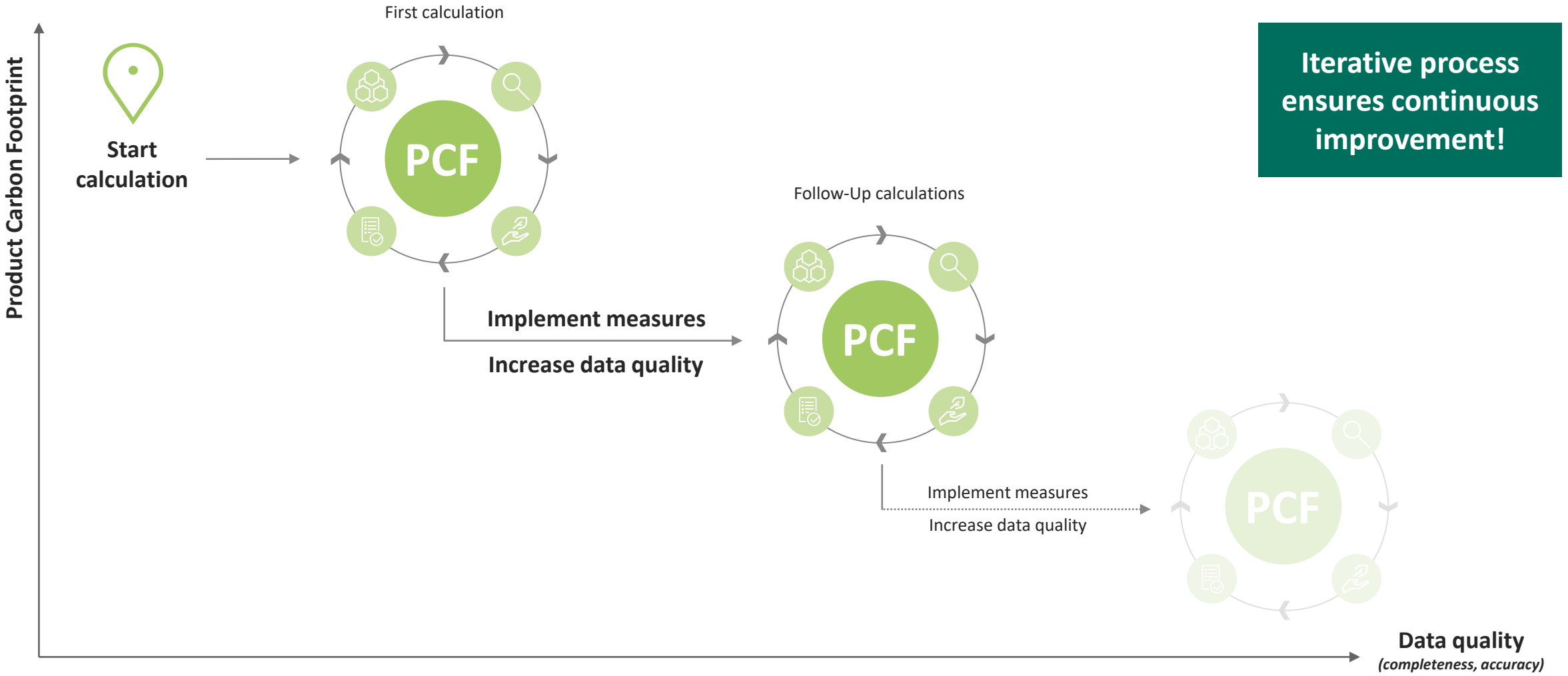
Repeat PCF calculations to track progress in your roadmap



Iterative process ensures continuous improvement!

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Examples for support to start PCF calculation

Software

paid software w. consulting/ guidance, easy to get started, low entry barriers

Carbmee

carbmee

CoZero

COZERO

Sphera (GABI database)

sphera

Other commercial software solutions available

Software

for free

OpenLCA

OPENLCA

CCaLC

CaLC

GHG Emissions tool

Other commercial trainings available

Trainings

Edx course

edX

EcoChain

BSRIA

BSRIA

Databases

GEMIS

GEMIS

PROBAS

Umwelt Bundesamt

DEFRA

Other paid databases available

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Thank you!