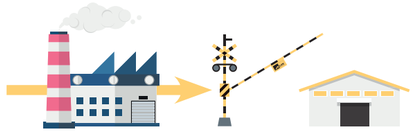
CARBON FOOTPRINT BOUNDARIES



In the **cradle-to-gate approach**, processes are analysed from the extraction of raw materials through the production of operating and auxiliary materials to the manufacture of the end or intermediate product (i.e. ending at the factory gate before onward transport to the customer). This approach offers maximum comparability between different companies or products without being overly time-consuming/expensive.
In the **cradle-to-cradle** approach, the complete

life cycle of a product is mapped. In doing so, it always needs to be weighed up whether the considerable additional effort involved in this approach is justified by the additional knowledge gained. Often, the necessary data is not available and must be substituted with assumptions, which in turn relativise the accuracy of the result.

DIFFERENT TYPES OF CARBON FOOTPRINT

The **corporate carbon footprint** (CCF) is an environmental balance sheet of all relevant greenhouse gas emissions of a company within a certain period of time (usually 1 year). In the context of sustainability management, the CCF can be used to map the potential for emission savings. The progress towards defined reduction targets can also be monitored in the time series.

The **product carbon footprint** (PCF) represents all relevant greenhouse gas emissions caused by a specific product in the various phases of its life cycle.

GREENHOUSE GASES INCLUDED IN THE CARBON FOOTPRINT

Carbon dioxide (CO_2) itself is the most important element in the calculation of the carbon footprint. In addition, five other greenhouse gases are also taken into account in accordance with the Kyoto Protocol: methane (CH4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6). The specific greenhouse gas potential of each of these gases is significantly higher than that of CO_2. In order to make these gases comparable, they are converted into CO_2 equivalents (CO_2e). However, because of the amount of CO_2 compared to the other gases, CO_2 clearly accounts for the predominant total share of greenhouse gases.

WHAT IS A CARBON FOOTPRINT? HOW DOES IT WORK?

With the increasing focus on the importance of climate change in general and the impact of the actions of industry on climate change, various new legal frameworks and terminology have recently emerged. In particular, the assessment of CO_2 emissions plays an important role here. The following explanations aim to address some crucial and frequently asked questions in order to provide assistance in people's everyday work and to shed some light on what is, for many, a new and extremely complex topic.

WHAT DOES THE CARBON FOOTPRINT MEASURE – AND FOR WHAT PURPOSE?

The carbon footprint is the result of an emissions calculation. This calculation maps the greenhouse gas emissions of a plant, a company or a product and makes it possible to compare emissions from different sources.

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As a steel manufacturer and Bavaria's largest recycling company, our enterprise has been future-oriented and committed to resource conservation since 1972. Recycling scrap metal using the electric arc furnace process produces up to 80 % less CO_2 than the classic blast furnace process. Our vision is to be 100% climate-neutral by 2040. We are ensuring low carbon (low-carb) emission production both today and in the future. Find out more at
www.locas-bayern.com

LSW CARBON FOOTPRINT

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WHAT ARE SCOPE 1, 2 AND 3 EMISSIONS?

The Greenhouse Gas Protocol (GHG Protocol) classifies emissions into the following three areas (known as scopes):

- **SCOPE 1** emissions are direct emissions of greenhouse gases within the company (e.g. gas burners in reheating furnaces).
- **SCOPE 2** emissions are indirect emissions of greenhouse gases by energy suppliers (e.g. through power generation in coal-fired power plants).
- **SCOPE 3** emissions are indirect emissions of greenhouse gases through upstream and downstream activities (e.g. transport of scrap or production of alloying and aggregate materials).

SCOPE 1 and **SCOPE 2** emissions are clearly defined and easily comparable between individual product manufacturers.. By contrast, in the case of Scope 3 emissions, the carbon footprint boundary must be weighed up in each individual case taking into account the effort involved and the resulting additional gain in knowledge.
It is therefore difficult to compare **SCOPE 3** emissions between different companies.

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ROLE OF THE THREE SCOPES IN THE LSW EMISSIONS CALCULATION

LSW SCOPE 1:
- Process emissions from the production of crude steel (alloying agents, carbon carriers, graphite electrodes, dolomitic lime etc.) and the further processing of crude steel billet in the rolling mills, in finishing and in heat treatment.
- Emissions from stationary combustion of fossil fuels such as natural gas, fuel oil and propane
- Emissions from mobile combustion of fuel for the operation of company cars and vehicles of the internal machinery fleet (e.g. forklift trucks, sweepers etc.)
- Fugitive emissions from escaped refrigerants from air conditioning units

LSW SCOPE 2:
- Emissions from the generation of purchased energy (electricity)

LSW SCOPE 3:

ELEMENT A: Upstream emissions
- Fuel and energy-related activities not included in **SCOPE 1** or **SCOPE 2** (natural gas, fuel oil, propane, diesel/petrol, electricity)
- Emissions resulting from production of refrigerants
- Emissions resulting from extraction/production of raw materials, consumables and supplies, in particular alloying and aggregate materials
- Transport routes of steel scrap
- Commuting routes of employees
- Disposal of waste generated in the plant

ELEMENT B: Downstream emissions: Transport routes of end products to customers (to be calculated individually for all our customers)

PCF DIFFERENTIATION FOR DIFFERENT LSW PRODUCT CATEGORIES

The PCF of reinforcing steel (RS) and high-quality steel (HQS) as well as different processing depths were differentiated:

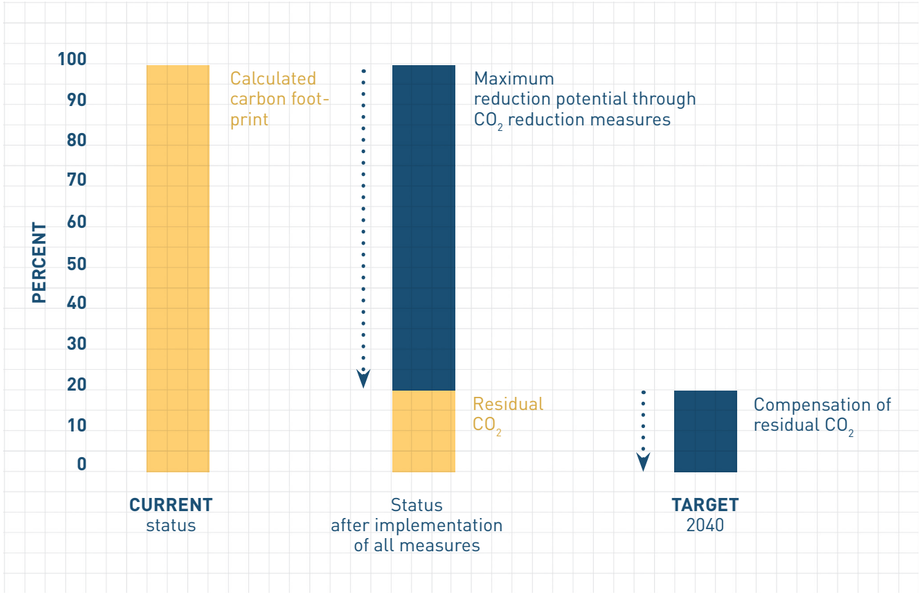
- RS raw billet
- RS finished product
- HQS raw billet
- HQS rolled, non-straightened, unannealed
- HQS rolled, straightened, unannealed
- HQS rolled, straightened, standard time annealed
- HQS rolled, straightened, GKZ/AC annealed

Further differentiation, e.g. different diameters of the bar steels, has very little influence on the overall result. For this reason, no further differentiation was made here.

IMPLEMENTATION OF A CO_2 REDUCTION STRATEGY

A low carbon footprint should be achieved primarily through avoidance and mitigation. Only when all in-house CO_2 reduction measures have been exhausted should carbon compensation measures be considered. The principle is:

1. Avoidance BEFORE reduction.
2. Reduction BEFORE compensation.
3. Compensation only where avoidance and reduction do not make sense.



You can find more detailed information about the carbon footprint and CO_2 compensation options at: **www.locas-bayern.com.**