

Validation Statement

VS-3651112



Industrie Service

Mehr Wert.
Mehr Vertrauen.

The systematic approach for the calculation and reporting of Product Carbon Footprints, documented in the report on the CFP/LCA-study from 29 December 2023 prepared by

thyssenkrupp Hohenlimburg GmbH
Oeger Straße 120
58119 Hagen, Germany,

was validated in accordance with ISO 14064-03:2019 regarding the compliance with the requirements of ISO 14067:2019, in particular Annex C (normative).

We hereby confirm that the responsible organization has developed appropriate procedures to calculate and report the

Product Carbon Footprint („cradle-to-gate“) of hot-rolled steel strips

in accordance with ISO 14067:2019.

The life cycle inventory was calculated beginning with the extraction and processing of raw materials to steel slabs, transportation of steel slabs, production of hot rolled steel products, ready for dispatch (= “cradle-to-gate”, without shipping to client and further life cycle steps).

Level of assurance:	= reasonable
Level of materiality:	<ul style="list-style-type: none">▪ Upstream emissions: 10% (raw material extraction and production of steel slabs, transport to own factory gate)▪ Emissions from processes under control: 3% (hot-rolling, cutting, pickling, annealing, intercompany transportation)

This validation statement is only valid for the scope of assessment and in combination with the objectives, explanations and criteria for evaluation specified in the following validation report. This validation statement refers to the validation of the systematic approach for the calculation and reporting of PCFs regarding compliance with the ISO 14067 but does not represent the verification of a single specific PCF.

TÜV SÜD Industrie Service GmbH
Verification Body for Greenhouse Gases
Accredited according to ISO 17029 in combination with ISO 14065
Westendstrasse 199, 80686 Munich, Germany

Munich, 26 February 2024

Explanations to the Validation Statement

Brief description of the Validation process

thyssenkrupp Hohenlimburg GmbH (contracting entity) has voluntarily entrusted TÜV SÜD Industrie Service GmbH (“verification body”) to carry out an independent (third party) validation of the systematic approach for the calculation and reporting of Product Carbon Footprints (PCFs) of hot-rolled steel strips regarding compliance with the ISO 14067, in particular Annex C (normative).

This review is based on the intended area of application, the goals and criteria as agreed upon with the commissioning on 15 June 2022.

The staff deployed by the verification body carried out an audit on 21 and 22 February 2023 with representatives of the contracting company, including document reviews and a site-visit at the Hohenlimburg rolling mill. In the course of further online audits, open points were solved, and missing information supplemented.

Roles and responsibilities

The determination and reporting of GHG emissions are the sole responsibility of our client. Our role and responsibility as an accredited verification body was to independently verify the adequacy of the GHG emissions reported by our client, as well as the underlying systems and processes for data collection, analysis and control, in accordance with the requirements of ISO 14064-3.

Standards for quantification and reporting of Product Carbon Footprints

ISO 14067 (2019) (“Greenhouse gases – Carbon footprint of products – Requirements and guidelines for quantification”), especially Annex C (normative, “The CFP systematic approach”)

System boundaries of Product Carbon Footprints

This validation covers the product system for the production of hot-rolled steel strips (“cradle-to-gate”).

thyssenkrupp Hohenlimburg GmbH purchases steel slabs from various steel manufacturers, which are either, if necessary, first temporarily stored at the Huckingen storage location and adjusted (cut to size), or transported directly to the Oege/Hohenlimburg rolling mill.

There the slabs are heated in a walking beam furnace and then rolled into hot strip (coils) to the appropriate dimensions. Optional processing steps such as controlled coil cooling (coil showers), pickling, annealing or slitting can be carried out. Cross-cutting as well as transport and storage in consignment warehouses are possible through an external service provider. These processes are still within the system boundaries under consideration. The “cradle-to-gate” boundaries end when the finished hot strip is packaged.

The following diagram visualizes the process flow/product system:

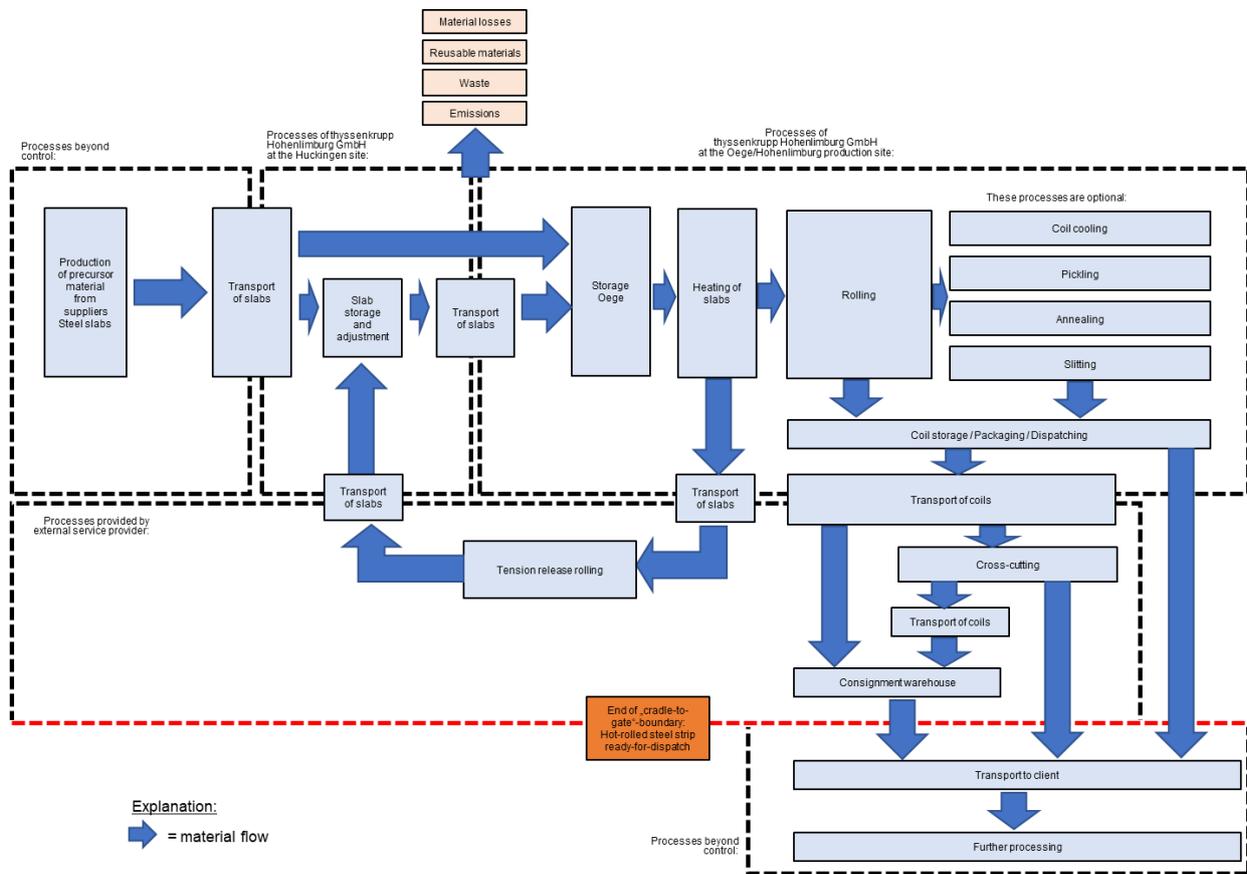


Figure 1: Product system for hot-rolled steel strips by thyssenkrupp Hohenlimburg GmbH

GHG emissions that do not result from productive facilities or direct production processes are not considered in the product system.

These cut-offs and the production system itself are described in detail in the report on the CFP/LCA study by thyssenkrupp Hohenlimburg GmbH.

PCF quantification and reporting system assessment

thyssenkrupp Hohenlimburg GmbH uses the life cycle modeling software “GaBi” from the company Sphera to reproduce all GHG-relevant processes and calculate the individual product carbon footprint per hot-rolled steel strip depending on the processing steps carried out. In this software modeling, the parameters for each individual process step (e.g. energy consumption per slab for a specific processing stage) are determined individually based on real data collection. The software modeling and those process parameters were developed at the time of the audit using real data from the 2021 calendar year. The model makes it possible to incorporate changes in energy use and changing emissions from the primary material into the calculation of the product carbon footprints. An update of the software modeling is only necessary if there are significant changes to the plant configuration or the production steps.

As part of the audit, the software modeling was checked for correct functionality, i.e. whether the system results in the correct product carbon footprints based on the given inputs and process parameters (to exclude errors in the modeling). By comparing the

product carbon footprints of all hot strips produced in calendar year 2021, calculated using the modeling, with the manually monitored total energy consumption and production figures verified in the EU ETS, a consistent accounting of GHG emissions could be confirmed. The individual process steps and parameters included in the modeling were also examined during the audit. A detailed description of software modeling and the systematic approach as such is contained in the report on the CFP/LCA study by thyssenkrupp Hohenlimburg GmbH.

Relevant accounted emissions

The greenhouse gas inventory contains the specified greenhouse gases as CO₂ equivalents. Other greenhouse gases were taken into account; individual greenhouse gases were not accounted separately. The data basis for the greenhouse gas equivalents determined via the GaBi life cycle modeling is provided by the GaBi databases with the accounting procedure "CML 2001 – August 2016 Incl. LandUseCange (LUC)," as well as other sources cited in the CFP/LCA study report.

Targeted actions / Particularities in reporting

The emissions from the production of precursor products (slabs) are responsible for a high proportion of the total emissions accounted. These values are self-disclosures from the suppliers, which are usually available for specific grades. These values were checked for plausibility; independent verification of these values was not part of the validation process.

Intended users of this Validation Statement

- thyssenkrupp Hohenlimburg GmbH itself for developing Carbon Management strategies
- clients of thyssenkrupp Hohenlimburg GmbH

Note: This validation statement represents a validation of the Product Carbon Footprint (PCF) calculation method developed by the client with regard to methodology as defined by the ISO 14067:2019, but not a verification of a single specific PCF. This declaration is therefore not a confirmation of a PCF for a product specifically produced in 2021 or later. If necessary, individual client products can be verified separately.

Standard for the Validation

ISO 14064-3:2019 ("Specification with guidance for verification and validation of GHG statements")

Objectives of the Validation

The assessment was performed with due regard to our impartiality in a risk-based approach. Rational procedures were applied to reach reliable and reproducible conclusions. Within the scope of our audit, a sufficient amount of suitable evidence needed to be collected and explained in the audit by representatives of thyssenkrupp Hohenlimburg GmbH and persons appointed for this purpose. This was to enable sufficient traceability of the information presented with the systematic approach for calculating and reporting Product Carbon Footprints.

Criteria

The data review was conducted according to the following criteria:
Relevance, completeness, accuracy, transparency of information and consistency.
The assessment of alternatives according to the quantification model used was carried out according to the principle of conservatism.

Agreed level of assurance

reasonable

Comment:

At a reasonable - but not absolute - level of assurance, we verify that the GHG statement is substantially correct. This includes a review of the processes, data and evidence on their correctness and accuracy with an appropriately adequate sample size.

Materiality threshold

Level of materiality:

- Upstream emissions: 10% (Raw materials extraction and processing to steel slabs, transportation to own factory gate)
- Processes controlled by thyssenkrupp Hohenlimburg GmbH: 3% (Hot-rolling, cutting, pickling, annealing, intercompany transportation)

Comment:

The materiality threshold is a benchmark for our assessment of data gaps, misstatements and non-conformities remaining at the end of our review.

Gaps, omissions, inaccuracies identified during the review that result in quantities greater than the established thresholds constitute a "material deviation", i.e. non-conformities, that must be addressed before a verification/validation statement can be issued.

Methods of Validation

- Strategic analysis and risk assessment of the CFP/LCA study report
- Interviews with responsible personnel at thyssenkrupp Hohenlimburg GmbH
- Site visit to the Hohenlimburg rolling mill
- Review of evidences for material inputs and energy consumption
- Review of the data and information systems and the methodology for the collection, aggregation, analysis and verification of the information used to determine GHG emissions (= PCF software modeling "GaBi")
- Sample recalculation of the PCF software modeling
- Independent review (quality assurance by an auditor not involved in the validation process)

Conclusion

With our review of the systematic approach to calculating and reporting of Product Carbon Footprints of hot-rolled steel strip from thyssenkrupp Hohenlimburg GmbH (documented in the report on the CFP/LCA study in the final version dated 29 December 2023), we conclude that, in all material respects, the greenhouse gas emissions are presented fairly and factually in accordance with the specifications of the ISO 14067: 2019.

thyssenkrupp Hohenlimburg GmbH has developed suitable accounting procedures to determine GHG emissions using the CFP/LCA study presented.

Based on the results of our validation, we confirm the suitability of the systematic approach to calculating and reporting Product Carbon Footprints and the achievement of the agreed level of assurance and compliance with the agreed materiality thresholds.

The validation statement is valid under the following conditions:

- Until a significant change in the calculation method
- Until a significant change to the production processes

Our validation statement can only be interpreted as a whole together with the report on the CFP/LCA study by thyssenkrupp Hohenlimburg GmbH (in the final version dated 29 December 2023).

This statement is issued in accordance with the agreement reached with the client and within the framework of our validation and verification programme. The results documented here are based on our internal documentation dated 26 February 2024, for this validation with project no. 3651112.