

VOLVO CONSTRUCTION EQUIPMENT

PCF METHODOLOGY REPORT PRINCIPLES

Volvo CE carbon footprint principles

As part of its efforts to address climate change and act towards a net-zero greenhouse gas emission value chain, Volvo CE is disclosing the carbon footprint for all our main products.

As there are no *Product Category Rules (PCR)* established for the construction equipment industry, the *Environmental Product Declaration (EPD)* standard is not applicable. This means product carbon footprint reports disclosed by different manufacturers (OEMs) in the construction equipment industry are not directly comparable due to variations in for example methodology, system boundaries, and input data.

Based on global standards

The principles to calculate the Volvo CE carbon footprints are primarily based on the **ISO 14067:2018** standard covering the quantification and reporting of a product's carbon footprint (PCF). The **systematic approach** described in the standard are used to develop Volvo CE's carbon footprint principles, in order to facilitate the development of PCFs for more products within the same organization. The PCF calculations are further integrated within the environmental management system, following the ISO 14001 standard.

Exceptions

While still fulfilling the ISO standard requirements, the following cut-offs have been applied:

- Solvent from surface coating at Volvo CE factories and at suppliers.
- Packaging materials used for inbound logistics.
- Packaging materials that are not circulated are included in the waste statistics.
- Waste and wastewater treatment
- Unplanned machine breakdown needing repair and service are excluded.
- First set of tires are included, any additional tires used throughout the lifespan is cut-off.
- Inbound logistics of raw materials to suppliers are considered negligible and hence excluded.
- Transportation to waste handling facilities is considered negligible and hence excluded.

Definitions

Product carbon footprint (PCF): A measure of a product's climate change impact.

CML2001: An environmental impact category that was developed by CML in 2001. The current version was updated in January 2016.

CO₂ equivalent (CO₂eq.): A unit used for emission of greenhouse gases by considering their Global Warming Potential (GWP) in relation to carbon dioxide.

Cradle-to-Grave: A system boundary that includes all activities occurring during the life cycle, starting from raw material acquisition (cradle) to waste handling of the used product (grave).

Cut-off rules: Activities that are not expected to have a material influence of the overall results (less than 1%) can be excluded from the scope.

EPD (Environmental Product Declaration): A global standard that quantifies environmental information on the life cycle of a product to enable comparison between product fulfilling the same function.

Functional-/Declared unit: Functional unit= The unit that describe the environmental impact per delivered function. Declared unit= The unit that describe the environmental impact per quantity of product when the function is not definable

GWP (Global Warming Potential): An environmental impact indicator used to measure the climate impact by considering the degree to which the substance emitted from the system investigated contribute to an increased radiative forcing.

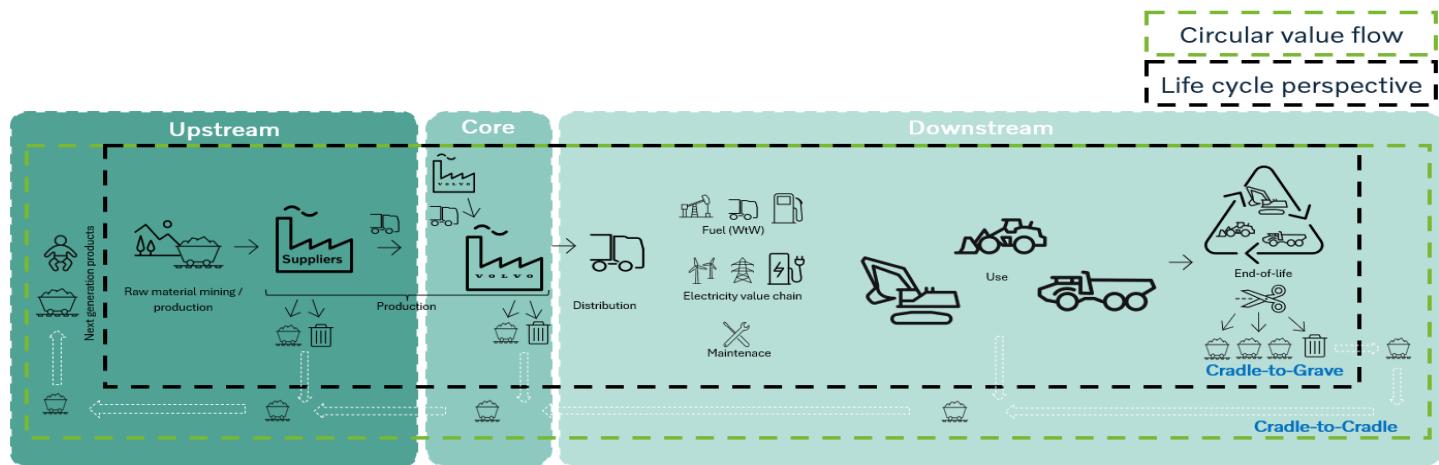
LCA (life cycle assessment): A standardized method for quantifying a product's environmental impact across its entire life cycle.

OEM: Original Equipment Manufacturer.

PCR (Product Category Rule): A set of product specific rules to ensure that functionally similar products are assessed in the same way when conducting the LCA.

SBTi (Science Based Target initiative): A method for companies to set scientifically based targets in line with the Paris agreement (staying at a global temperature increase of 1,5 degrees Celsius).

Product Value Chain



Scope	Activity	Applied by Volvo CE
Upstream	Raw materials	Covers emissions from the extraction and pre-processing of all included raw materials.
	Supplier manufacturing	Covers the emissions from manufacturing production of raw materials into components, for at least 80% of the components. The rest is extrapolated.
	Inbound logistics	Covers the emissions from transportation from suppliers to Volvo CE manufacturing facilities, as well as internal transport between Volvo CE's facilities.
Core	Core manufacturing	Emissions from the core manufacturing of both components and the complete machines, that occurs at Volvo CE's production facilities.
Downstream	Outbound logistics	Emission from the distribution of products from Volvo CE's production facilities to dealers.
	Usage	Emissions from fuel/electricity consumption and maintenance, based on technical data and service programme.
	End-of-life treatment	Emissions from recycling, incineration and landfilling of the included materials, when the machines reach its end of life.

Principles based on the ISO 14067:2018

Items	Applied by Volvo CE
Functional-/ Declared unit	Declared unit: kg CO ₂ -eq per operating hour, per the SBTi definition
System boundaries	Cradle-to-grave
Impact assessment method	CML2001 – Jan 2016 The time horizon used is GWP100 excl. biogenic carbon. It only includes fossil carbon dioxide and thereby excludes the uptake and emissions of biogenic carbon dioxide.
Cut-off rules	In this study the cut-off rule implies that no credit is given to the materials that are recovered and sent to additional product life cycles. Processes with can be assumed to contribute less than 1% to the environmental impact does not have to be included in the study.
Allocation	The basis for all allocation made is either mass (kg), production time (hours), or production volume (number of units).

For more information

Please contact your Volvo CE representative, who will put you in contact with the Volvo CE LCA team.