# Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

# XCarb® recycled and renewably produced Hot Rolled Coils

from

## ArcelorMittal Europe – Flat Products

| | |
|---|---|
| Programme: | The International EPD® System, www.environdec.com |
| Programme operator: | EPD International AB |
| EPD registration number: | S-P-11080 |
| Publication date: | 2023-12-15 |
| Revision date: | 2024-02-19 (Version 1.1) |
| Valid until: | 2028-12-14 |

*An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com*

# General information

## Programme information

| | |
|---|---|
| **Programme:** | The International EPD® System |
| **Address:** | EPD International AB<br>Box 210 60<br>SE-100 31 Stockholm<br>Sweden |
| **Website:** | www.environdec.com |
| **E-mail:** | info@environdec.com |

| **Accountabilities for PCR, LCA and independent, third-party verification** |
|---|
| **Product Category Rules (PCR)** |
| CEN standard EN 15804 serves as the Core Product Category Rules (PCR) |
| Product Category Rules (PCR): *PCR 2019:14 Construction products, version 1.3.1 Published on 2023.06.20. Based on CEN standard EN 15804. ISO standard ISO 21930 and CEN standard EN 15804 serves as the core PCR. The product group classification for the assessed products is UN CPC 412.* |
| PCR review was conducted by: The Technical Committee of the International EPD® System. See *https://www.environdec.com/about-us/the-international-epd-system-about-the-system* for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact. |
| **Life Cycle Assessment (LCA)** |
| LCA accountability: *Leonardo Guimarães Ribeiro, ArcelorMittal Europe – leonardo.guimaraesribeiro@arcelormittal.com* |
| **Third-party verification** |
| Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:<br>☒ EPD verification by individual verifier<br><br>Third-party verifier: Dr Matthew Fishwick, Fishwick Environmental Ltd<br><br>  <br><br>Approved by: The International EPD® System |
| Procedure for follow-up of data during EPD validity involves third party verifier:<br>☒ Yes ☐ No |

The Environmental Product Declaration (EPD) owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off

rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison.

For further information about comparability, see EN 15804 and ISO 14025.

## Company information

Owner of the EPD: ArcelorMittal Europe – Flat Products.

Contact: ArcelorMittal Europe – Flat Products: flateurope@arcelormittal.com.

Description of the organisation: ArcelorMittal Europe – Flat Products is the largest producer of flat steel in Europe and produces hot rolled coils, cold rolled coils, coated products, tinplate, plate and hot-dip galvanised products, and enamelled and electrical steels. Flat Products has 11 integrated and mini-mill sites, and primary facilities in five countries. It sells to a wide range of industries including packaging, general industry (civil engineering, construction, domestic appliances, oil & gas, renewable energies, yellow & green goods) and automotive. ArcelorMittal Europe's target is to reduce Scope 1 and 2 greenhouse gas emissions by 35% by 2030, with a further ambition to be net zero by 2050. Its strategy is consistent with limiting global warming to 1.5°C above pre-industrial levels, and it is committed to having our targets officially validated by the Science Based Targets Initiative (SBTi).

Product-related or management system-related certifications: ArcelorMittal Sestao is covered by CE-marking including Declaration of Performances, ISO 9001, ISO 14001, and ISO 45001 certificates.

Name and location of production site(s): ArcelorMittal Sestao, Chavarri 6, 48910 Sestao, Spain.

## Product information

Product name: XCarb® recycled and renewably produced Hot Rolled Coils.

Product identification: Hot Rolled Coils included into this EPD are covered by one of the following names: XCarb® RRP Hot Rolled Coils; XCarb® recycled and renewably produced Hot Rolled Coils. These products have the XCarb® recycled and renewably produced steel brand name and the associated certificates to prove the traceability.

Product description:
This EPD refers to XCarb® recycled and renewably produced Hot Rolled Coils used for any commercial and structural applications, including Amstrong® high strength steel range.

The mean thickness value is at 5 mm but the declaration refers to hot rolled steel coils between 985 and 1550 mm wide and 1 to 12.74 mm thick.

For the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) Regulation (EU) No. 305/2011 (CPR) applies. The product has a declaration of performance taking into consideration EN 10025-1 - Hot rolled products of structural steels - Part 1: General technical delivery conditions. For the application and use, the respective national provisions apply.

Following European standards concerning Hot Rolled Coils can be used by manufacturers for various pieces or components:

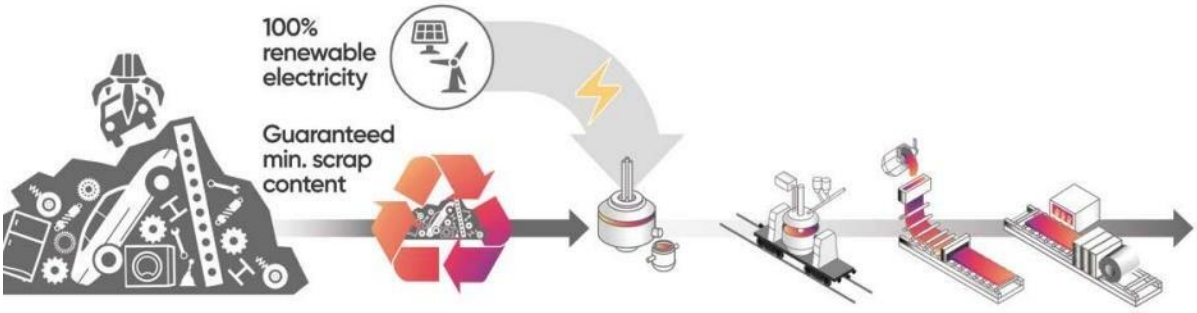
- EN 10025-2 – Hot rolled products of structural steels.
- EN 10149-2 – Hot rolled flat products made of high yield strength steels for cold-forming.
- General technical delivery conditions can be considered as specified in EN 1993-1-3 – Eurocode 3 Design of steel structures – Part 1-3: General rules – Supplementary rules for cold-formed members and sheeting.
- Drawing steels according to EN 10111.
- Special grades according to EN ISO 683.

The products not covered by EN 10025, are not under CPR and do not require CE marking to be placed on the market.

Characteristics are also specified in the American standard ASTM G101-04:2015 (American Society for Testing and Materials) for hot-rolled material.

Manufacturing process:
XCarb® recycled and renewably produced Hot Rolled Coils are produced at ArcelorMittal Sestao in Spain; their production is based on Electric Arc Furnace and Compact Strip Production processes with 100% renewable electricity supply with Guarantee of Origins.

Products are continuously rolled at high temperatures going through a series of stands of rotating cylinders. Steel alloy composition and process parameters are set to guarantee the required grade. The coils are then delivered to processors and manufacturers for shaping into finished products.




Applications:
XCarb® recycled and renewably produced Hot Rolled Coils can be used in various applications, such as:

- Construction: structural or non-structural welded sections, façade & cladding, roofing, sunscreens & shades;
- Road equipment: safety barriers, protection equipment, sound insulation wall panels;
- Art sculpture & Other industrial applications such as containers, filters, etc.

They are delivered as wide coils that can be processed in slit coils or cut-to-length sheets. They can be further processed by all conventional manufacturing operations used for hot rolled steel: mechanical and thermal cutting, bending, drawing, roll-forming, stamping, welding, etc.

UN CPC code: 412 Products of iron or steel.

Geographical scope: Europe

## LCA information

Functional unit / declared unit:
1 metric tonne XCarb® recycled and renewably produced Hot Rolled Coils.

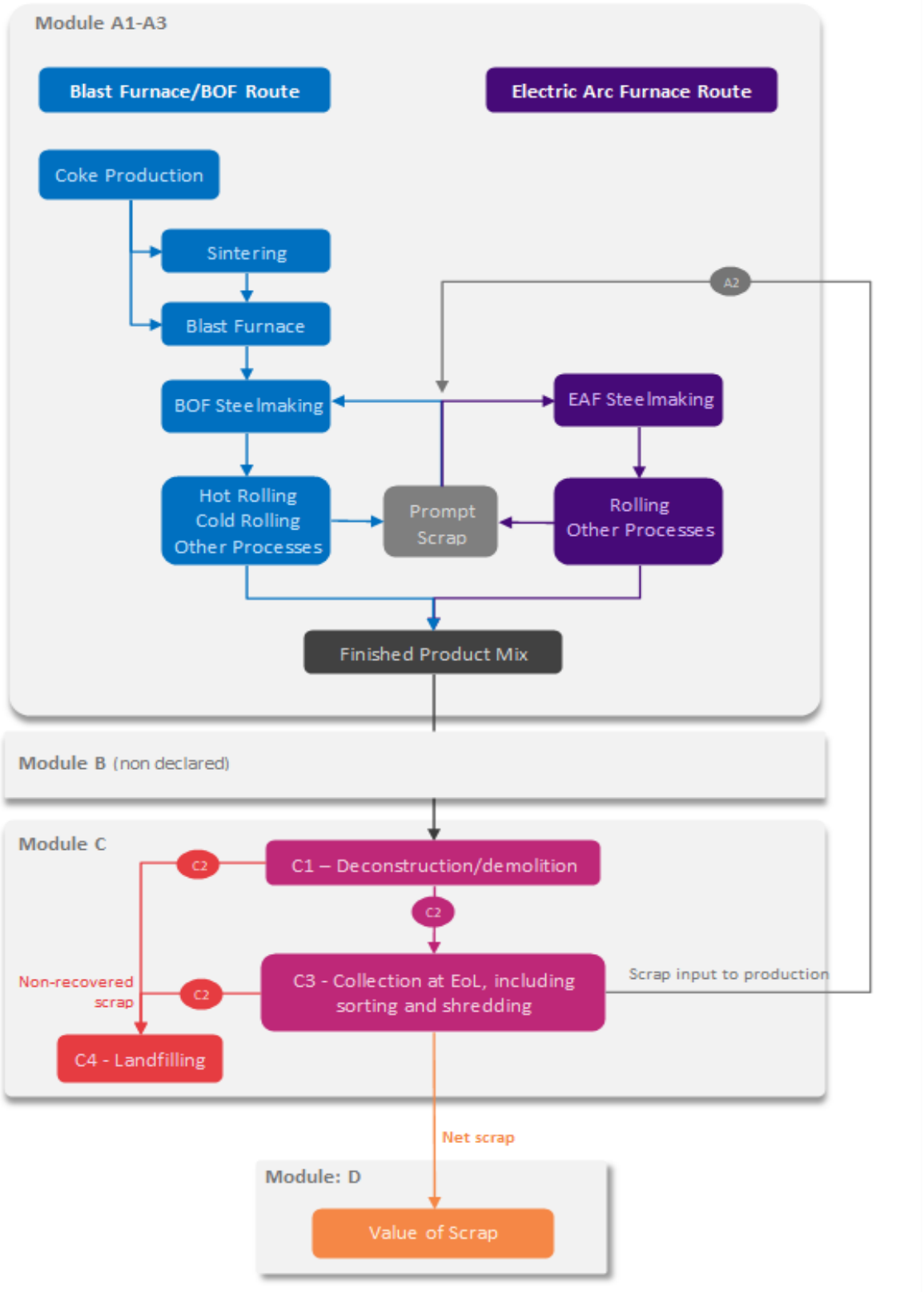
Reference service life:
A reference service life for XCarb® recycled and renewably produced Hot Rolled Coils is not declared. Hot rolled coils are used in construction with many different application purposes. The lifetime therefore will be limited by the application and corresponding service. At the end of life, they will be recovered and recycled into a new steel product.

Time representativeness:
The collection of the foreground data refers to the year 2021.

Database(s) and LCA software used:
The background data has been taken from the latest available Sphera LCA FE (GaBi) database, Managed LCA Content 2023.2 and the LCA model was created using LCA Sphera for Experts software, version 10.7.1.28

Description of system boundaries:
The system boundaries are: Cradle to gate with options, modules C1–C4, and module D.

System diagram:



- *Module A1 to A3:*

The product stage includes provision of all materials, products, and energy, as well as waste processing up to the end-of waste state or disposal of final residues during the product stage. Impacts on raw material transportation, including external scrap, and intermediate products are included.

These modules consider the production of hot rolled coils at the site ArcelorMittal Sestao, in Spain. XCarb® recycled and renewably produced Hot Rolled Coils are packed only with strapping. Transit packaging may include pallets or cradle.

For the modelling, the electricity supply was based on a renewable electricity grid mix from the 2023.2 Managed LCA Content (Sphera) database. The emission factor for the GWP-GHG indicator is 25,88 g $CO_2$eq./kWh.

- *Module C1 to C4:*

Within this EPD, the modules C1-C4 are included. These modules consider the dismantling of the considered product (C1), the transportation of the dismantled components to their End of Life (EoL) destination (C2), the waste processing for recovery or recycling (C3) as well as the disposal (C4), if given.

At EoL, steel material leaves the product system in C3 for recycling in Module D. The environmental impacts from grinding, sorting and transportation of steel scrap are included. Based on common practices, the considered EoL scenario for the steel material is 98% recycling and 2% losses.

| Category | Subcategory | Unit | Quantity |
|---|---|---|---|
| Collection process | Collected separately | kg | 1000 |
| Recovery | Collected with mixed construction waste | kg | 0 |
| | Reuse | kg | 0 |
| | Recycling | kg | 980 |
| | Landfill | kg | 20 |
| | Incineration | kg | 0 |
| | Incineration with energy recovery | kg | 0 |
| | Energy conversion efficiency rate | kg | 0 |
| Disposal | Material for final disposal | kg | 0 |
| Transport | Deconstruction site to scrap processing plant | km | 100 |
| | Scrap processing plant to site for end of waste | km | 200 |

- *Module D:*

Module D includes declared benefits and loads resulting from the net flow of secondary fuels or materials exiting the product system. This excludes flows that have been allocated as co-products.

Metals are assumed to reach the end of waste state after they have gone through a sorting and shredding process. The treatment as well as net benefits and loads of reuse or recycling potentials (for the net scrap amount only) are grouped to module D.

Potential environmental benefits are given for the net steel scrap that is produced at the end of a final product's life, calculated as follows:
Net scrap = Amount of steel recycled at end-of-life – Scrap input from previous product life cycles.

In the manufacturing of XCarb® recycled and renewably produced Hot Rolled Coils, 959 kg of external scrap was used. At the end-of-life, 980 kg of scrap are recovered for recycling and 0 kg for reuse. This means that the system has a net output of 21 kg of scrap (980 + 0 - 959), which is shown in module D as an environmental credit or burden depending on the impact category.

Cut-off criteria: The environmental impact of the product studied has been assessed by considering all significant processes, materials, and emissions. Excluded flows are assumed to have a negligible impact, contributing less than 5% to the cumulative impact assessment categories.

The production of capital equipment, facilities, and infrastructure required for manufacture has not been considered.

The current study has evaluated both transit and product packaging wherever possible. For raw materials, no packaging was able to be considered. Nevertheless, it is reasonable to assume that most of the raw materials, and more specifically those where quantities are most relevant, such as scrap, beach iron, DRI and lime, are transported in bulk.

As part of the iterative LCA process, the outcomes obtained on the packaging LCA modelling have led to a decision to exclude results of packaging in the current LCA results. This is due to the low impact contribution which was nevertheless reducing the results of most currently observed indicator in EPDs, the GWP-total.

Data quality and sources: Data quality is compliant with ISO 14025:2006. All primary data were collected for 2021. All background data come from the Sphera LCA FE (GaBi) 2023.2 databases and are representative for the years 2018-2023.

Allocation: No allocation was applied for co-products generated in the processes under ArcelorMittal ownership. This includes materials such as slag, dust and sludge. Scrap inputs in module A1-A3, including pre-consumer scrap, are treated as ‘burden free’. Externally sourced pre-consumer scrap was treated as post-consumer scrap meaning that the only burdens considered are a transport burden, taken into account in A2, and a burden on the end-of-life scenarios (waste processing, transport and destination). For such scraps, economic allocation was deemed not feasible. For all background data used in the model, the standardallocation assumptions of the used datasets were maintained.

More information: https://industry.arcelormittal.com/catalogue

## Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results)

| | Product stage | | | Construction process stage | | Use stage | | | | | | | End of life stage | | | | Resource recovery stage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Raw material supply | Transport | Manufacturing | Transport | Construction installation | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport | Waste processing | Disposal | Reuse-Recovery-Recycling-potential |
| **Module** | **A1** | **A2** | **A3** | **A4** | **A5** | **B1** | **B2** | **B3** | **B4** | **B5** | **B6** | **B7** | **C1** | **C2** | **C3** | **C4** | **D** |
| Modules declared | X | X | X | NR | NR | NR | NR | NR | NR | NR | NR | NR | X | X | X | X | X |
| Geography | EU | EU | EU | - | - | - | - | - | - | - | - | - | GLO | GLO | GLO | GLO | GLO |
| Specific data used | >95% | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Variation – products | Not relevant | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Variation – sites | Not relevant | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

NR- Not reported. MNR- Module not declared.

# Content information

XCarb® recycled and renewably produced Hot Rolled Coils

| Product content | Weight[1], kg | Post-consumer material, weight[2] | Biogenic material, weight |
|---|---|---|---|
| Steel | 1,000 | 26,8% | 0% and 0 kg C / kg |
| **Chemical composition** | | | |
| Iron | 989,3 | | |
| Manganese | 6,3 | | |
| Silicon | 0,7 | | |
| Carbon | 0,9 | | |
| Other | 2,8 | | |

[1.] these numbers are the average values of product compositions.

[2.] Post-consumer material according to this PCR excludes pre-consumer scrap. According to ISO 14021:2016, the average recycled content, which includes external pre- and post-consumer recycled scrap, is approximately 87%. The figures provided represent our best estimate at the time of publication.

| Packaging Materials | Weight, kg | Weight (as % of product weight) | Weight biogenic carbon, kg C/kg |
|---|---|---|---|
| Steel | 0,796 | 0,0796% | 0 resp, 0 |
| Plastic | 0,075 | 0,0075% | 0 resp, 0 |
| Timber | 1,5 | 0,1500% | 0,59 |

The products do not contain any of the substances of very high concern (SVHC) regulated by the Regulation (EC) No 1907/2006 (REACH) or the Regulation (EC) No 1272/2008 of European parliament.

# Results of the environmental performance indicators

The environmental performance of the functional unit of 1 metric tonne of XCarb® recycled and renewably produced Hot Rolled Coils are reported below using the parameters and units as specified in PCR 2019:14.
The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

## Mandatory impact category indicators according to EN 15804+A2:2019

**Results per 1 metric tonne of XCarb® recycled and renewably produced Hot Rolled Coils**

| Indicator | Unit | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|
| GWP-fossil | kg $CO_2$ eq. | 6,00E+02 | 4,16E+01 | 2,60E+01 | 1,34E+00 | 2,96E-01 | -3,72E+01 |
| GWP-biogenic | kg $CO_2$ eq. | 1,94E-01 | 2,22E-02 | 1,04E-02 | 9,82E-03 | 0,00E+00 | 2,19E-01 |
| GWP-luluc | kg $CO_2$ eq. | 2,70E-01 | 3,73E-01 | 2,45E-01 | 1,04E-03 | 9,33E-04 | -4,95E-03 |
| GWP-total | kg $CO_2$ eq. | 6,00E+02 | 4,20E+01 | 2,63E+01 | 1,36E+00 | 2,97E-01 | -3,70E+01 |
| ODP | kg CFC 11 eq. | 8,41E-08 | 1,54E-11 | 3,45E-12 | 2,20E-11 | 7,64E-13 | 5,00E-11 |
| AP | mol $H^+$ eq. | 1,85E+00 | 2,95E-01 | 1,92E-01 | 3,30E-03 | 2,13E-03 | -9,10E-02 |
| EP-freshwater | kg P eq. | 4,04E-04 | 1,50E-04 | 9,69E-05 | 4,80E-06 | 6,05E-07 | -8,67E-06 |
| EP-marine | kg N eq. | 4,15E-01 | 1,45E-01 | 9,51E-02 | 9,70E-04 | 5,51E-04 | -1,46E-02 |
| EP-terrestrial | mol N eq. | 4,54E+00 | 1,61E+00 | 1,05E+00 | 1,04E-02 | 6,06E-03 | -1,31E-01 |
| POCP | kg NMVOC eq. | 1,26E+00 | 2,79E-01 | 1,82E-01 | 2,63E-03 | 1,66E-03 | -5,94E-02 |
| ADP-minerals& metals* | kg Sb eq. | 7,39E-04 | 2,77E-06 | 1,76E-06 | 1,95E-07 | 1,39E-08 | -2,11E-04 |
| ADP-fossil* | MJ | 6,46E+03 | 5,81E+02 | 3,61E+02 | 2,71E+01 | 4,00E+00 | -3,70E+02 |
| WDP* | $m^3$ | 1,76E+02 | 6,23E-01 | 3,20E-01 | 2,66E-01 | 3,30E-02 | -2,51E+00 |
| Acronyms | GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment. EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption | | | | | | |

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*
*We discourage the use of the results of modules A1-A3 without considering the results of module C.*

## Resource use indicators according to EN 15804+A2:2019

| Results per 1 metric tonne of XCarb® recycled and renewably produced Hot Rolled Coils | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Indicator** | **Unit** | **A1-A3** | **C1** | **C2** | **C3** | **C4** | **D** |
| PERE | MJ | 1,89E+04 | 4,68E+01 | 2,63E+01 | 1,51E+01 | 6,52E-01 | 4,56E+02 |
| PERM | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PERT | MJ | 1,89E+04 | 4,68E+01 | 2,63E+01 | 1,51E+01 | 6,52E-01 | 4,56E+02 |
| PENRE | MJ | 6,48E+03 | 5,83E+02 | 3,62E+02 | 2,71E+01 | 4,00E+00 | -1,16E+04 |
| PENRM | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PENRT | MJ | 6,48E+03 | 5,83E+02 | 3,62E+02 | 2,71E+01 | 4,00E+00 | -1,16E+04 |
| SM | kg | 9,59E+02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RSF | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| NRSF | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| FW | $m^3$ | 4,64E+00 | 4,96E-02 | 2,88E-02 | 1,22E-02 | 1,01E-03 | -1,18E+02 |
| Acronyms | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water | | | | | | |

## Waste indicators according to EN 15804+A2:2019

| Results per 1 metric tonne of XCarb® recycled and renewably produced Hot Rolled Coils | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Indicator** | **Unit** | **A1-A3** | **C1** | **C2** | **C3** | **C4** | **D** |
| Hazardous waste disposed | kg | 8,61E-06 | 9,53E-10 | 1,12E-09 | -1,96E-09 | 8,72E-11 | -8,64E-05 |
| Non-hazardous waste disposed | kg | 4,46E+01 | 9,69E-02 | 5,52E-02 | 1,87E-02 | 2,00E+01 | 1,40E+02 |
| Radioactive waste disposed | kg | 4,04E-02 | 2,88E-03 | 6,78E-04 | 3,99E-03 | 4,56E-05 | 1,27E-03 |

## Output flow indicators according to EN 15804+A2:2019

| Results per 1 metric tonne of XCarb® recycled and renewably produced Hot Rolled Coils | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Indicator** | **Unit** | **A1-A3** | **C1** | **C2** | **C3** | **C4** | **D** |
| Components for re-use | kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Material for recycling | kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 9,80E+02 | 0,00E+00 | 0,00E+00 |
| Materials for energy recovery | kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Exported energy, electricity | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Exported energy, thermal | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |

## Additional environmental performance indicator

| Results per 1 metric tonne of XCarb® recycled and renewably produced Hot Rolled Coils | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Indicator** | **Unit** | **A1-A3** | **C1** | **C2** | **C3** | **C4** | **D** |
| GWP-GHG | kg $CO_2$ eq. | 6,00E+02 | 4,17E+01 | 2,61E+01 | 1,36E+00 | 2,97E-01 | -3,70E+01 |

** The indicator is calculated with characterization factors from IPCC AR6 GWP 100, excl biogenic carbon, and includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013*

# References


- General Programme Instructions of the International EPD® System. Version 4.0.
- PCR 2019:14. Construction Products, Version 1.3.1
- Sustainability of construction works - Environmental product declarations - Methodology for selection and use of generic data; CEN/TR 15941:2010
- CPR: Regulation (EU) No 305/2011 of the European parliament and of the council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC.
- EN 15804: EN 15804:2012+A2:2019: Sustainability of construction works -Environmental Product Declarations - Core rules for the product category of construction products.
- EN ISO 14025: EN ISO 14025:2011-10 Environmental labels and declarations - Type III environmental declarations - Principles and procedures
- EN ISO 14040: EN ISO 14040:2009-11 Environmental management - Life cycle assessment - Principles and framework
- EN ISO 14044: EN ISO 14044:2006-10 Environmental management - Life cycle assessment - Requirements and guidelines.
- LCA FE: LCA FE Software System and Database for Life Cycle Engineering, Sphera Solution GmbH, Leinfelden-Echterdingen, 2022 (https://www.gabi-software.com/support/gabi)
- EN 10025-1:2004 - Hot rolled products of structural steels - Part 1: General technical delivery conditions.

## Impact category indicators according to EN 15804+A1

To ensure consistency within the different versions of the EN 15804 for user performing a complete LCA of a building, the table below indicates the environmental performances of XCarb® recycled and renewably produced Hot Rolled Coils following the version EN 15804+A1. The end-of life scenario for steel is 98% recycling and 2% losses.

| Results per 1 metric tonne of XCarb® recycled and renewably produced Hot Rolled Coils | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Indicator** | **Unit** | **A1-A3** | **C1** | **C2** | **C3** | **C4** | **D** |
| Global warming potential | kg CO2 eq. | 5,95E+02 | 4,14E+01 | 2,59E+01 | 1,34E+00 | 2,84E-01 | -3,66E+01 |
| Depletion potential of stratospheric ozone layer | kg CFC 11 eq. | 9,90E-08 | 1,82E-11 | 4,06E-12 | 2,59E-11 | 8,99E-13 | 5,88E-11 |
| Acidification potential of land and water | kg SO2 eq. | 1,50E+00 | 2,01E-01 | 1,31E-01 | 2,57E-03 | 1,70E-03 | -7,79E-02 |
| Eutrophication potential | kg(PO4)3 eq. | 1,45E-01 | 5,07E-02 | 3,31E-02 | 4,06E-04 | 1,92E-04 | -4,97E-03 |
| Formation potential of tropospheric ozone photochemical oxidants | kg ethene-eq. | 1,21E-01 | -7,71E-02 | -5,10E-02 | 2,30E-04 | 1,28E-04 | -1,76E-02 |
| Abiotic depletion potential for non-fossil resources | kg Sb eq. | 7,40E-04 | 2,77E-06 | 1,75E-06 | 2,22E-07 | 1,41E-08 | -2,11E-04 |
| Abiotic depletion potential for fossil resources | MJ | 6,13E+03 | 5,67E+02 | 3,55E+02 | 1,56E+01 | 3,84E+00 | -3,82E+02 |

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