ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Fabricated Steel Reinforcement Products (Cut & Bent Rebar and Prefabricated Cages/Piling Cages)

Reinforcement Solutions Limited

EPD HUB, HUB-6452

Published on 25.05.2026, last updated on 25.05.2026, valid until 25.05.2031

Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.2 (24 Mar 2025) and JRC characterization factors EF 3.1.

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Reinforcement Solutions Limited
Address	Wyrley Brook Park, Walkmill Lane, Cannock, England, WS11 0XA
Contact details	sales@rsl-steel.co.uk
Website	rsl-steel.co.uk

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804:2012+A2:2019/AC:2021 and ISO 14025
PCR	EPD Hub Core PCR Version 1.2, 24 Mar 2025
Sector	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with modules C1-C4, D
EPD author	Dr Nathan Wood, Tunley Environmental
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Elena Antuña-Bernardo as an authorized verifier for EPD Hub

This EPD is intended for business-to-business and/or business-to-consumer communication. The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

PRODUCT

Product name	Fabricated Steel Reinforcement Products (Cut & Bent Rebar and Prefabricated Cages/Piling Cages)
Additional labels	Loose rebar and piling cages from mixed steel sources: Alpa, Megasa and Riva SAM
Product reference	-
Place(s) of raw material origin	France, Spain, Portugal, United Kingdom
Place of production	Cannock, United Kingdom
Place(s) of installation and use	United Kingdom
Period for data	One Year, 01 November 2024 - 31 October 2025
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3 (%)	0
GTIN (Global Trade Item Number)	-
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	99.1

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 Tonne of Fabricated Reinforced Steel Product
Declared unit mass	1000 kg
Mass of packaging	0 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	337
GWP-total, A1-A3 ($kgCO_2e$)	390
Secondary material, inputs (%)	114
Total energy use, A1-A3 (kWh)	2300
Net freshwater use, A1-A3 (m^3)	7.12

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Reinforcement Solutions Limited is a UK-based specialist supplier of concrete reinforcement products and associated structural solutions for the construction industry. Operating from its distribution and fabrication facilities in the United Kingdom, the company provides reinforcement systems designed to support the structural integrity, durability and performance of reinforced concrete structures across a wide range of building and civil engineering applications.

Reinforcement Solutions' product portfolio includes reinforcement steel products such as piling cages, cut-and-bend rebar, mesh reinforcement, couplers and ancillary reinforcement components used in reinforced concrete construction. These products are supplied to contractors, infrastructure projects and commercial developments across sectors including residential construction, infrastructure, industrial facilities and public works.

Reinforcement Solutions focuses on providing reliable reinforcement supply, technical support and logistics services to ensure compliance with relevant structural design and construction standards. Its products are used in a variety of reinforced concrete applications including foundations, structural frames, slabs and other load-bearing concrete elements within modern construction projects.

PRODUCT DESCRIPTION

The declared product comprises prefabricated steel reinforcement products such as piling cages, manufactured from carbon steel reinforcing bar and coil sourced from four European mills: Riva Alpa (France) 70%, Megasa bar (Spain) 10%, Riva SAM coil (France) 10%, and Megasa coil (Portugal) 10%. The steel is processed by Reinforcement Solutions Limited into, piling cages reinforcement mesh, cut and bent reinforcement, prefabricated cages and other fabricated reinforcement assemblies for use in reinforced concrete structures.

Reinforcing steel is used to enhance the tensile strength, crack control and structural performance of concrete in civil, commercial and residential applications. The products are used in a range of reinforced concrete elements including foundations, slabs, walls, columns and piling works.

Prefabricated assemblies are manufactured off site to project-specific requirements using welding processes supported by shielding gas and MIG/MAG welding wire. This off-site prefabrication approach improves quality consistency and installation efficiency while helping to reduce on-site labour, material waste and health and safety risks. Standard welded mesh products, including square mesh, structural mesh and wrapping mesh, are also supplied in a range of sizes and specifications to suit construction requirements.

Further information can be found at:
rsl-steel.co.uk

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	100	France, Spain, Portugal, United Kingdom
Minerals	0	-
Fossil materials	0	-
Bio-based materials	0	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	0

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 Tonne of Fabricated Reinforced Steel Product
Mass per declared unit	1000 kg
Functional unit	-
Reference service life	-

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
x	x	x	ND	ND	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	x		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/ demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Not declared = ND.

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

A market-based approach is used in modelling the electricity mix utilized in the factory.

Module A1 includes the upstream production of the steel reinforcement inputs used to manufacture the declared product. The steel input is modelled using supplier-specific EPD data representing hot rolled concrete reinforcing steel bars and coils sourced from four European mills: Riva Acier S.A.S. (Limay Porcheville and SAM Montereau, France), Megasa (Narón, Spain), and Megasa (Seixal, Portugal). The input mix is based on manufacturer data and consists of approximately 70% Riva Alpa bar (697.59 kg/tonne), 10% Megasa bar (99.66 kg/tonne), 10% Riva SAM coil (99.66 kg/tonne) and 10% Megasa coil (99.66 kg/tonne). A copper-coated MAG welding wire dataset is also included within A1 at 3.44 kg per declared unit. An allowance for manufacturing losses is included based on site-specific annual scrap data for the reference period (November 2024 to November 2025), yielding a scrap rate of 3.75%, equivalent to 38.87 kg of steel scrap per tonne of finished product.

Module A2 includes transport of all input materials from supplier to the UK manufacturing facility. Each steel source was modelled using a combination of sea freight and road freight, reflecting actual supply origins. Riva Alpa bar is transported 558 km by sea and 286.7 km by road; Megasa bar 1,300.1 km by sea and 294 km by road; Riva SAM coil 378 km by sea and 286.7 km by road; and Megasa coil 1,883.5 km by sea and 317.6 km by road. Sea freight is modelled using a bulk carrier for dry goods dataset and road freight using a >32 tonne diesel EURO 6 lorry dataset. Copper-coated MAG welding wire and shielding gases are transported 32.3 km and 99.07 km by road, respectively, using a 7.5-16 tonne EURO 6 lorry dataset. Steel wire packaging arriving with raw steel inputs follows the same source-specific transport distances as the associated steel products, apportioned by the sourcing split.

Module A3 covers manufacture of the reinforcement products at the UK facility, including cutting, bending, fabrication and welding. Electricity use is modelled using the market-based residual mix dataset (Electricity, medium voltage, residual mix) and was allocated to the declared product on a mass basis using total metered facility electricity consumption for the reference period and combined production output for Reinforcement Solutions Limited and the co-located operation at the site, resulting in an allocated electricity intensity of 15.94 kWh per tonne of finished product. The electricity input has been grossed up by 8.57% to account for transformation and distribution losses, increasing the modelled input to 17.306 kWh per declared unit. Welding inputs comprised shielding gases (argon 0.0086 kg, carbon dioxide 0.0013 kg and oxygen 0.00016 kg per declared unit) and MIG/MAG welding wire (3.44 kg per declared unit), based on annual purchasing records scaled to declared production. Direct process emissions to air from welding gas use are included within this module.

Ancillary material inputs comprised the steel wire packaging used to secure incoming steel reinforcement. No one-way product packaging is applied to the finished steel rebar cages at the factory gate; the product is dispatched as a large fabricated assembly by road freight without additional packaging materials. Webbing lifting slings used for handling are reusable operational items and were therefore excluded from the declared unit.
Manufacturing waste generated at the facility consists primarily of steel

offcuts and scrap arising from cutting, bending and fabrication operations, at 38.87 kg per declared unit. Of this, 85% (33.04 kg) is sent for recycling, consistent with global steel recycling rate assumptions from the World Steel Association (worldsteel.org, Life Cycle Inventory study, 2020), and transported 250 km to a recycling facility by road freight (>32 tonne, EURO 5). The remaining 15% (5.83 kg) is sent to inert material landfill and transported 50 km by road freight (>32 tonne, EURO 5).

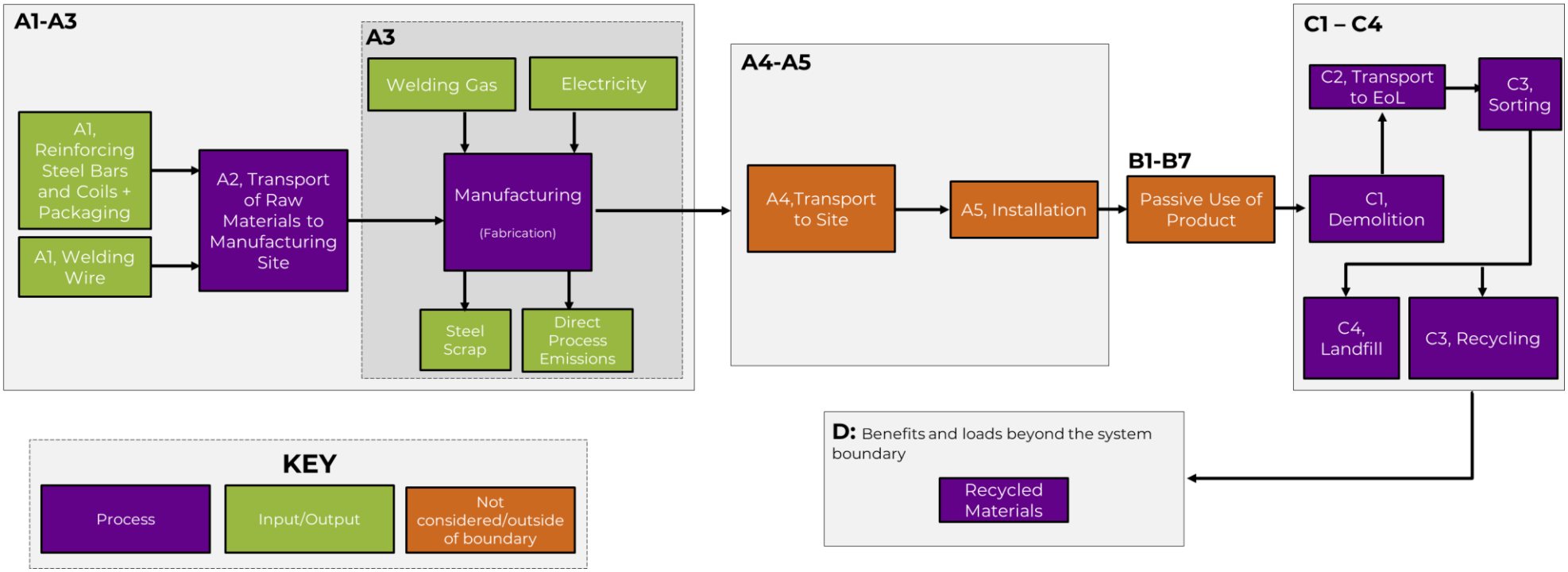
PRODUCT END OF LIFE (C1-C4, D)

Steel reinforcement is a highly recyclable material and, at the end of the service life of the structure, is assumed to be recovered following demolition and separation from the surrounding concrete. In this study, an end-of-life steel recovery rate of 85% has been applied in accordance with World Steel Association data, with the remaining 15% assumed to be disposed of to landfill.

The end-of-life scenario is modelled on the basis of 1,000 kg of steel reinforcement. At the end of life, the structure is deconstructed using building machinery. Diesel fuel consumption during deconstruction is modelled as 24 MJ per tonne of steel (approximately 0.65 kg of diesel), using two datasets: "Diesel, burned in building machine" to represent combustion during operation, and "Market for diesel, low-sulfur" to represent the upstream production and supply of the fuel. This approach ensures that both the direct combustion impacts and the upstream fuel production burdens are fully captured within Module C1, in accordance with the assumption cited in Gervasio & Dimova (JRC Technical Report: Model for Life Cycle Assessment of Buildings, 2018). Of the total material, 850 kg is assumed to be transported 250 km by lorry (>32 tonne, EURO 5) for recycling, while 150 kg is assumed to be transported 50 km by the same transport mode for landfill disposal. Modules C2-C4 therefore include transport to waste processing, waste treatment and final disposal in accordance with these scenario assumptions.

Module D represents the potential benefits and loads beyond the system boundary associated with the recovery and recycling of the steel fraction, calculated in accordance with EN 15804+A2. To avoid double counting, the net recyclable mass credited in Module D is adjusted to reflect only the virgin material fraction of the recovered steel. The weighted average secondary content of the steel inputs is 92.2%, derived from supplier-specific EPD data for each mill (Riva Alpa bar 97%, Megasa bar 69%, Riva SAM coil 97%, Megasa coil 82%, weighted by their respective proportions in the product mix). The net virgin material flow into Module D is therefore 66.3 kg per declared unit (850 kg recovered × 7.8% virgin fraction). The avoided burden is applied to the displacement of primary low-alloyed steel production through secondary material recovery.

MANUFACTURING PROCESS



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. Upstream process calculations rely on generic data as defined in the Bibliography section. The steel input for the rebar is modelled using supplier-specific EPD data representing hot rolled concrete reinforcing steel bars and coils sourced from four European mills: Riva Acier S.A.S. (EPD number: EPD-RIVA ACIER-197-EN & EPD-RIVA ACIER-175-EN), Megasa (EPD number: GlobalEPD 001-011 rev.1), and Megasa (EPD number: GlobalEPD 001-007) Manufacturer-provided specific and generic data were used for the product's manufacturing stage. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging material	Physical Properties
Ancillary materials	Physical Properties
Manufacturing energy and waste	Physical Properties

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	Multiple products
Grouping method	Based on average results of product group - by total mass
Variation in GWP-fossil for A1-A3, %	0

This EPD covers multiple prefabricated steel reinforcement products manufactured by Reinforcement Solutions Limited at one UK manufacturing site. The product range includes reinforcement mesh, cut and bent reinforcement, prefabricated cages and other fabricated reinforcement assemblies produced from carbon steel reinforcing bar and coil sourced from four European mills.

The grouped products share the same principal raw materials, manufacturing processes and site conditions. Core production steps include cutting, bending and welding, with common use of ancillary materials such as MIG/MAG welding wire and shielding gases. The products are used in reinforced concrete applications across civil, commercial and residential construction.

All products within the group are manufactured from identical raw material inputs, using the same fabrication processes, at the same site, and are declared on a common basis of one tonne of finished product. The products differ only in their physical geometry and dimensions, not in their material composition, mass per unit or manufacturing energy intensity. Because the steel input mix, welding consumables, electricity intensity and waste generation rate are allocated uniformly across all product types on a mass basis, the environmental results per declared unit are identical regardless of which product type is considered. The GWP fossil variation across the product group is therefore 0%, and no meaningful spread exists between individual product types.

The declared results represent the annual production-weighted average of the included product range for the reference period. Mass-based allocation was applied for shared site electricity use, ancillary materials and manufacturing waste. The same end-of-life scenario and recycling assumptions were applied across all grouped products and are therefore considered representative of the declared product family.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 and EPD Process Certification v3.2.5. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.10.1/3.11/3.12 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1/3.11/3.12 environmental data sources follow the methodology ‘allocation, Cut-off, EN 15804+A2‘.

The following sources were used in the development of scenarios, assumptions and background data within this EPD:

Supplier-specific EPD datasets (Module A1)

- Riva Acier S.A.S. - Hot rolled concrete reinforcing steel bars. EPD number: EPD-RIVA ACIER-175-EN. Applied as supplier-specific background dataset for Riva Alpa bar input (70% of steel mix).
- Riva Acier S.A.S. - Hot rolled concrete reinforcing steel coils. EPD number: EPD-RIVA ACIER-197-EN. Applied as supplier-specific background dataset for Riva SAM coil input (10% of steel mix).
- Megasa - Hot rolled reinforcement steel (wire rod and bars). EPD number: GlobalEPD 001-007. Applied as supplier-specific background dataset for Megasa bar input (10% of steel mix).
- Megasa - Hot rolled reinforcement steel (rebars and coils). EPD number: GlobalEPD 001-011 rev.1. Applied as supplier-specific background dataset for Megasa coil input (10% of steel mix).

End-of-life recycling rate (Modules A3, C3–C4 and D)

- World Steel Association (2020). Life Cycle Inventory (LCI) Study — 2020 Data Release. Available at: https://worldsteel.org/wp-content/uploads/Life-cycle-inventory-LCI-study-2020-data-release.pdf. Applied to justify an end-of-life steel recovery rate of 85%, with the remaining 15% disposed of in an inert material landfill.

Deconstruction energy (Module C1)

- Deconstruction energy is modelled at 24 MJ of diesel per tonne of material, in accordance with the assumption cited in: Gervasio, H. & Dimova, S. (2018). Model for Life Cycle Assessment (LCA) of buildings. JRC Technical Report, European Commission Joint Research Centre.

ENVIRONMENTAL IMPACT DATA

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	3.42E+02	3.57E+01	1.23E+01	3.90E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.42E+00	2.37E+01	1.89E+01	9.39E-01	-1.09E+02
GWP – fossil	kg CO_2e	2.89E+02	3.57E+01	1.22E+01	3.37E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.42E+00	2.37E+01	1.91E+01	9.38E-01	-1.09E+02
GWP – biogenic	kg CO_2e	5.24E+01	1.73E-02	6.25E-02	5.25E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.60E-04	5.36E-03	-2.75E-01	4.21E-04	0.00E+00
GWP – LULUC	kg CO_2e	4.00E-01	1.54E-02	2.49E-03	4.18E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.47E-04	1.06E-02	2.36E-02	5.38E-04	-1.71E-02
Ozone depletion pot.	kg CFC-$_{11}$e	3.13E-05	7.16E-07	2.93E-07	3.23E-05	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.59E-08	3.50E-07	2.54E-07	2.61E-08	-3.62E-07
Acidification potential	mol H^+e	1.36E+00	2.00E-01	4.08E-02	1.60E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.16E-02	8.07E-02	2.28E-01	6.57E-03	-4.43E-01
EP-freshwater[2)]	kg Pe	4.95E-03	2.70E-03	6.01E-03	1.37E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.77E-05	1.84E-03	1.27E-02	8.21E-05	-7.90E-02
EP-marine	kg Ne	2.48E-01	4.82E-02	9.51E-03	3.06E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.00E-02	2.65E-02	5.06E-02	2.52E-03	-9.84E-02
EP-terrestrial	mol Ne	3.63E+00	5.30E-01	9.99E-02	4.26E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.10E-01	2.89E-01	5.72E-01	2.76E-02	-1.07E+00
POCP ("smog")[3)]	kg NMVOCe	8.44E-01	2.12E-01	3.24E-02	1.09E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.29E-02	1.19E-01	1.70E-01	9.95E-03	-3.65E-01
ADP-minerals & metals[4)]	kg Sbe	2.64E-03	9.75E-05	6.18E-05	2.80E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.69E-07	6.61E-05	1.35E-03	1.40E-06	-1.20E-03
ADP-fossil resources	MJ	5.31E+03	5.25E+02	2.10E+02	6.04E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.15E+01	3.44E+02	2.58E+02	2.30E+01	-1.01E+03
Water use[5)]	m^3e depr.	9.24E+01	2.92E+00	2.14E+00	9.74E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.10E-02	1.70E+00	5.03E+00	1.01E+00	-2.46E+01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	2.39E-05	3.19E-06	6.42E-07	2.77E-05	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.16E-07	2.37E-06	3.12E-06	1.51E-07	-8.07E-06
Ionizing radiation[6)]	kBq U235e	3.08E+01	5.28E-01	3.78E+00	3.51E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.34E-02	2.99E-01	2.22E+00	1.38E-02	4.10E+00
Ecotoxicity (freshwater)	CTUe	2.61E+03	4.33E+02	1.94E+02	3.23E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.80E+01	4.86E+01	1.26E+03	1.54E+01	-5.02E+03
Human toxicity, cancer	CTUh	1.41E-06	6.21E-09	1.98E-09	1.42E-06	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.46E-10	3.91E-09	1.69E-08	1.70E-10	-1.62E-08
Human tox. non-cancer	CTUh	1.06E-05	3.15E-07	9.23E-08	1.10E-05	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.87E-09	2.22E-07	1.16E-06	3.83E-09	-7.51E-07
SQP[7)]	-	1.86E+03	4.73E+02	5.26E+01	2.39E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.08E+00	3.46E+02	4.95E+02	4.52E+01	-3.45E+02

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator; 7) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy[8)]	MJ	2.00E+03	7.58E+00	1.37E+01	2.02E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.97E-01	4.71E+00	4.73E+01	2.15E-01	-8.78E+01
Renew. PER as material	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renew. PER	MJ	2.00E+03	7.58E+00	1.37E+01	2.02E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.97E-01	4.71E+00	4.73E+01	2.15E-01	-8.78E+01
Non-re. PER as energy	MJ	5.52E+03	5.25E+02	2.08E+02	6.25E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.15E+01	3.44E+02	2.58E+02	2.30E+01	-1.01E+03
Non-re. PER as material	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-re. PER	MJ	5.52E+03	5.25E+02	2.08E+02	6.25E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.15E+01	3.44E+02	2.58E+02	2.30E+01	-1.01E+03
Secondary materials	kg	1.14E+03	2.30E-01	7.72E-01	1.14E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.30E-02	1.46E-01	3.14E-01	5.72E-03	6.17E+01
Renew. secondary fuels	MJ	2.36E-08	2.66E-03	7.04E-04	3.36E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.41E-05	1.86E-03	1.47E-02	1.19E-04	-9.86E-03
Non-ren. secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m^3	3.15E+00	6.91E-02	3.91E+00	7.12E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.01E-03	5.08E-02	1.15E-01	2.38E-02	-3.97E-01

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	4.44E-02	8.44E-01	5.15E-01	1.40E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.53E-02	5.82E-01	1.70E+00	2.62E-02	-3.63E+01
Non-hazardous waste	kg	7.11E+01	1.63E+01	1.32E+01	1.01E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.14E-01	1.08E+01	6.70E+01	6.05E-01	-4.38E+02
Radioactive waste	kg	9.27E-02	1.30E-04	8.05E-04	9.36E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.29E-06	7.33E-05	5.67E-04	3.35E-06	1.05E-03

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	2.90E+01	0.00E+00	0.00E+00	2.90E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	3.58E+01	0.00E+00	3.30E+01	6.89E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	8.50E+02	0.00E+00	0.00E+00
Materials for energy rec	kg	8.27E-02	0.00E+00	0.00E+00	8.27E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	MJ	2.33E+01	0.00E+00	0.00E+00	2.33E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy – Heat	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ADDITIONAL INDICATOR – GWP-GHG

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG[9)]	kg CO_2e	2.90E+02	3.57E+01	1.22E+01	3.38E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.42E+00	2.37E+01	1.91E+01	9.39E-01	-1.09E+02

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. In addition, the characterisation factors for the flows – CH4 fossil, CH4 biogenic and Dinitrogen monoxide – were updated. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterisation factor for biogenic CO2 is set to zero

SCENARIO DOCUMENTATION

DATA SOURCES

Manufacturing energy scenario documentation

1. Electricity, medium voltage, residual mix, United Kingdom, Ecoinvent, 0.47 kgCO2e/kWh

End of life (C1-C4) - Scenario documentation

Scenario information	Value
Collection process: collected separately (kg)	-
Collection process: Mixed waste (kg)	1 metric tonne, mixed waste.
Recovery: re-use (kg)	0
Recovery: recycling (kg)	850
Recovery: energy recovery (kg)	0
Disposal (kg)	0
Scenario assumptions e.g. transportation (mode, km) & other	Landfill, 50km. Recycling, 250km.

THIRD-PARTY VERIFICATION STATEMENT

EPD Hub declares that this EPD is verified in accordance with ISO 14025 by an independent, third-party verifier. The project report on the Life Cycle Assessment and the report(s) on features of environmental relevance are filed at EPD Hub. EPD Hub PCR and ECO Platform verification checklist are used.

EPD Hub is not able to identify any unjustified deviations from the PCR and EN 15804+A2 in the Environmental Product Declaration and its project report.

EPD Hub maintains its independence as a third-party body; it was not involved in the execution of the LCA or in the development of the declaration and has no conflicts of interest regarding this verification.

The company-specific data and upstream and downstream data have been examined as regards plausibility and consistency. The publisher is responsible for ensuring the factual integrity and legal compliance of this declaration.

The software used in creation of this LCA and EPD is verified by EPD Hub to conform to the procedural and methodological requirements outlined in ISO 14025:2010, ISO 14040/14044, EN 15804+A2, and EPD Hub Core Product Category Rules and General Program Instructions.

Verified tools

Tool verifier: Magaly Gonzalez Vazquez
Tool verification validity: 27 March 2025 - 26 March 2028

Elena Antuña-Bernardo as an authorized verifier for EPD Hub Limited
25.05.2026