

Environmental Product Declaration

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



Altech Copper Pipes (mixed recycled and virgin material) /Altech kopparrör hårda

from

Saint-Gobain Distribution Sweden AB



Program:	The International EPD System, www.environdec.com
Program operator:	EPD International AB
Type of EPD:	EPD of multiple products, based on the average results of the product group, published by trader
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An EPD should provide current information and may be updated if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com.



General information

Program information

Programme:	The International EPD System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
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PCR and verification

Product Category Rules (PCR):
CEN standard EN 15804:2012+A2:2019/AC:2021 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): Construction Products PCR 2019:14 version 2.0.1, Environmental Footprint (EF) 3.1 method.
PCR review was conducted by: <i>The Technical Committee of the International EPD System. A full list of members is available on www.environdec.com. Review chair: Rob Rouwette (chair), Noa Meron (co-chair). The review panel may be contacted via support@environdec.com.</i>
Life Cycle Assessment (LCA)
LCA accountability: Tabi Farzad, SGDS, tabi.farzad@saint-gobain.se
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: <input checked="" type="checkbox"/> Individual EPD verification by individual verifier
Third-party verifier: <i>Sigita Židonienė, Vesta, sigita@vestaconsulting.lt</i> Verifiers company – Vesta Consulting, UAB
Approved by: The International EPD System
Procedure for follow-up of data during EPD validity involves third party verifier: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Ownership and limitations on use of EPD

The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but published in different EPD programs, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit 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 identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Information about EPD owner

Owner of the EPD and trader	Saint-Gobain Distribution Sweden AB Bryggerivägen 9 168 67 Bromma Stockholm
Contact	SGDS - Beriar Maroof (beriar.maroof@saint-gobain.se)
Description of the organisation	<p>Saint-Gobain Distribution Sweden AB - specialists in collaboration for more efficient business in construction and installation. Saint-Gobain Distribution Sweden AB is the head company of some of Sweden's leading trading companies in construction, sheet metal, tiles and installation. All the companies have long and solid industry experience and provide most of Sweden's craftsmen with materials for various projects. Customers in different companies can also buy support items from the sister companies in the group, and in selected cases, we take joint projects to facilitate the logistics of the supply of goods, which is then often critical for a smooth construction project.</p> <ul style="list-style-type: none"> • Optimera - construction trade for professional carpenters • Dahl – heat, plumbing and sanitary specialist • Bevego - building sheet metal, ventilation and technical insulation • Kakelspecialisten and Konradsson’s Tiles - tiles, tiling and bathroom fittings <p>The company’s focus is on sales and services with direct contact to about 150,000 customers regularly. Saint-Gobain Distribution Sweden AB is owned by Saint-Gobain with a presence in 64 countries and over 190 000 employees worldwide.</p>
Location of production site	Great Britain (GB), Bilston
Location of trader’s warehouse	Sweden (Bålsta)



Product information

Product name	Altech Copper pipes (mixed recycled and virgin material)/ Altech kopparrör hårda
Product identification	Copper pipes (mixed recycled and virgin material)
UN CPC code	The United Nations Central Product Classification (CPC) code for copper tubes/pipes (and fittings) is 41516 (CPC v1.1 / v2.1)
Product description	<p>The copper pipes are made from approximately 30% virgin copper cathode, 60% recycled copper scrap and 10% internal yield loss from the processes. All pipes are manufactured in the United Kingdom according to EN 1057, with the required country approval marks, including the CE mark.</p> <p>The pipes are seamless, round copper tubes, characterized by:</p> <ul style="list-style-type: none"> - High mechanical strength and corrosion resistance - Smooth internal surface and excellent formability - Long service life and 100% recyclability <p>Manufacturing and initial quality control take place in Bilston, GB, after which the products are packaged and transported to Sweden for storage and distribution. Saint-Gobain acts solely as the distributor, while all manufacturing is performed by the supplier in the GB</p>
Technical data	<p>The product holds a Declaration of Performance (DoP) in accordance with EN 1057:2006 + A1:2010, for: Seamless, round copper tubes for water and gas in sanitary and heating applications.</p> <p>Dimensions and Types:</p> <ul style="list-style-type: none"> - Outer diameter: 6 mm – 108 mm - Wall thickness: 0.6 mm – 2.5 mm - Supplied forms: Straight lengths (10–108 mm) and coils (6–28 mm) - Type of metal: Copper (Cu ≥ 99.9%) - Temperature limit of application: as specified in EN 1057 / EN 13348
Use	<p>These pipes are designed for a variety of domestic and industrial applications, such as:</p> <ul style="list-style-type: none"> - Distribution networks for hot and cold water - Hot water heating systems, including underfloor, wall, and overhead installations - Domestic gas and liquid fuel distribution - Wastewater sanitation systems

The EPD covers the following products variants in Table 1. Other sizes manufactured by the same supplier and using the same material may be added in future updates.

Table 1: Product variants

Art nr	Product name
4816000	ALT 10X0,8MM CU-PIPE L=2,5M P/M
4816001	ALT 12X1,0MM CU-PIPE L=2,5M P/M
4816002	ALT 15X1,0MM CU-PIPE L=2,5M P/M
4816003	ALT 18X1,0MM CU-PIPE L=2,5M P/M
4816004	ALT 22X1,0MM CU-PIPE L=2,5M P/M
4816005	ALT 28X1,2MM CU-PIPE L=2,5M P/M
4816006	ALT 35X1,5MM CU-PIPE L=2,5M P/M
4816007	ALT 42X1,5MM CU-PIPE L=2,5M P/M
4816008	ALT 54X1,5MM CU-PIPE L=2,5M P/M
4816009	ALT 15X1,0MM CU-PIPE L=3M P/M
4816010	ALT 22X1,0MM CU-PIPE L=3M P/M
4816011	ALT 28X1,2MM CU-PIPE L=3M P/M
4816012	ALT 35X1,5MM CU-PIPE L=3M P/M
4816013	ALT 42X1,5MM CU-PIPE L=3M P/M
4816014	ALT 54X1,5MM CU-PIPE L=3M P/M
4816015	ALT 8X0,8MM CU-PIPE L=5M P/M
4816016	ALT 10X0,8MM CU-PIPE L=5M P/M
4816017	ALT 12X1,0MM CU-PIPE L=5M P/M
4816018	ALT 15X1,0MM CU-PIPE L=5M P/M
4816019	ALT 15X1,2 CU-PIPE TJOCKV. L=5M
4816020	ALT 18X1,0MM CU-PIPE L=5M P/M
4816021	ALT 22X1,0MM CU-PIPE L=5M P/M
4816022	ALT 22X1,5 CU-PIPE TJOCKV. L=5M
4816023	ALT 28X1,2MM CU-PIPE L=5M P/M
4816024	ALT 28X1,5 CU-PIPE TJOCKV. L=5M
4816025	ALT 35X1,5MM CU-PIPE L=5M P/M
4816026	ALT 42X1,5MM CU-PIPE L=5M P/M
4816027	ALT 42X2,0 CU-PIPE TJOCKV. L=5M
4816028	ALT 54X1,5MM CU-PIPE L=5M P/M
4816029	ALT 54X2,0 CU-PIPE TJOCKV. L=5M
4816030	ALT 70X2,0MM CU-PIPE L=5M P/M
4816031	ALT 76,1X2,0MM CU-PIPE L=5M P/M
4816032	ALT 88,9X2,0MM CU-PIPE L=5M P/M
4816033	ALT 108X2,0MM CU-PIPE L=5M P/M

The UN CPC (Central Product Classification) code

The United Nations Central Product Classification (CPC) code for copper tubes/pipes (and fittings) is 41516 (CPC v1.1 / v2.1).

Content declaration

Description of the main components and/or material

The copper pipes are made from approximately 30% virgin copper cathode, 60% recycled copper scrap and 10% internal yield loss from the processes.

Packaging for the products consists exclusively of PVC, ensuring safe handling, storage, and transportation. This study reports environmental impacts for 1 kg of copper pipe articles as the declared unit, assuming a gross density of 8,960 kg/m³. The material specification for the product and its packaging is listed Table 2. This is the trader EPD.

Table 3: material specification for production of 1 kg copper pipe and its packaging

Material	Mass, kg	Pre-consumer recycled material, mass-% of product	Post-consumer recycled material, mass-% of product	Biogenic material, mass-% of product	Biogenic material ¹ , kg / declared unit
Copper Cathode (Virgin)	0,379	0	0	0	0
Copper scrap (Recycled)	0,575	0	57%	0	0
Copper scrap (internal)	0,046	4,6%	0	0	0
Total	1	4,6%	57%	0	0
Material	Mass, kg	Mass-% (versus the product)		Biogenic material ¹ , kg C / declared unit	
PVC	0.0004	0.04%		0	

Hazardous substances

At the date of issue of this declaration (date: 2025-01-02), there is no “Substance of Very High Concern” (SVHC) in concentration above 0.1 % in the products or packaging according to the European REACH regulation.

LCA information

Declared unit	1 kg of copper pipe
Reference service life	60 years. Copper pipe is expected to last for the useful life of the building under normal usage conditions.
Time representativeness	The data used to model product manufacturing correspond to 2024. The data from generic databases are from 2021 – 2024. No data used is older than 5 years.
Database(s) and LCA software used	Calculation completed in GaBi v 10.9 with an integrated Ecoinvent database v.3.10 integrated CUP2023.2

¹ 1 kg biogenic carbon in the product/packaging is equal to 44/12 kg of CO₂ uptake

Data

Generic database data was used for the production of raw materials, energy, transportation and end-of-life. Specific data was collected from the factory.

Data quality

All datasets used were sourced from reputable databases, specifically LCA for Experts (GaBi) v10.9 with an integrated Ecoinvent database v3.10, and CUP2023.2. These datasets offer strong technological representativeness and reflect either Sweden or the EU28 average, making them reliable.

Type of EPD

This is a trader EPD for multiple products EPD, published based on the results of product group. It covers a cradle-to-gate with options, modules C1-C4, module D and optional modules.

Omissions of life cycle stages and processes

- **A1-A3:** The plants, production of machines and transportation systems are excluded since the related flows are supposed to be negligible compared to the potential environmental impacts through the life cycle of the product
- **B1-B7:** The use phase of the products is not included
- The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities are excluded

Cut-off criteria

LCI data include a minimum of 99% of total inflows (mass and energy) per unit process, and 95% of total inflows (mass and energy) per life-cycle stages A1-A3, A4-A5, and C1-C4, aggregated modules B1-B5 and B6-B7, and module D. At least 95% of the environmental impact per such aggregated module is included in LCI data.

Minor flows that in total contribute less than 5 % of the overall mass, energy or environmental impact of the module are considered negligible and have been excluded. In this study, the packaging stage—including its production and transportation—is excluded, as only 4 grams of PVC are used as packaging material in total, which is considered negligible.

This EPD confirms that no data have been omitted with the intention of hiding environmental impacts and that the applied cut-off criteria comply with PCR v2 requirements.

Allocation

The allocation procedure follows Sections 4.5.2 and 4.5.3 of PCR 2019:14 v2.0.0 and complies with EN 15804+A2 and ISO 21930.

Allocation has been avoided wherever possible. The manufacturing facility produces exclusively copper pipes and generates no co-products. Therefore, no allocation between products has been required. All energy use, auxiliary materials and manufacturing inputs are directly assigned to the declared product.

No economic allocation has been applied.

Internal process scrap (approximately 10% yield loss) is fully reintegrated into the manufacturing process and remains within the system boundary. Consequently, no allocation to internal waste streams is required.

The product consists of approximately 30% virgin copper cathode and 60% externally sourced recycled copper scrap.

In accordance with this approach, recycled materials enter the system without environmental burdens from previous life cycles. Only impacts related to collection, sorting, processing and transport of scrap are included. To prevent double counting, no substitution credit related to recycled input is reported in Module D. Module D reflects only the net benefits associated with end-of-life recycling of the virgin copper fraction contained in the product.

Recycled copper contributes approximately 16.23% of the total GWP-GHG results in modules A1–A2. For transparency, the GWP-GHG intensity of the recycled copper input is reported separately in this EPD. The GWP-GHG intensity of recycled scrap copper is 1.43 kg CO₂ eq. per kg of scrap copper.

No allocation of module A3 manufacturing impacts between virgin and recycled inputs has been applied, as the material streams are physically combined during production and no co-products exist.

Geographical scope

Europe

Description of system boundaries

According to EN 15804:2012+A2:2019/AC:2021, all construction products should declare modules A1-A3 but also C1-C4 and D. LCA modelling approach is attributional LCA. The system boundary of this LCA study is set from a cradle-to-gate with options, modules C1-C4, module D and optional modules.

The life cycle stages included are the product stage (modules A1-A3), transport to the installation site (module A4), construction and installation and also packaging waste management (module A5), and the end-of-life stage (module C). Module D captures the benefits from the end-of-life treatment of materials, whether directed toward material or energy recovery. Module B is excluded as it is not associated with any activities or emissions that cause environmental impacts.

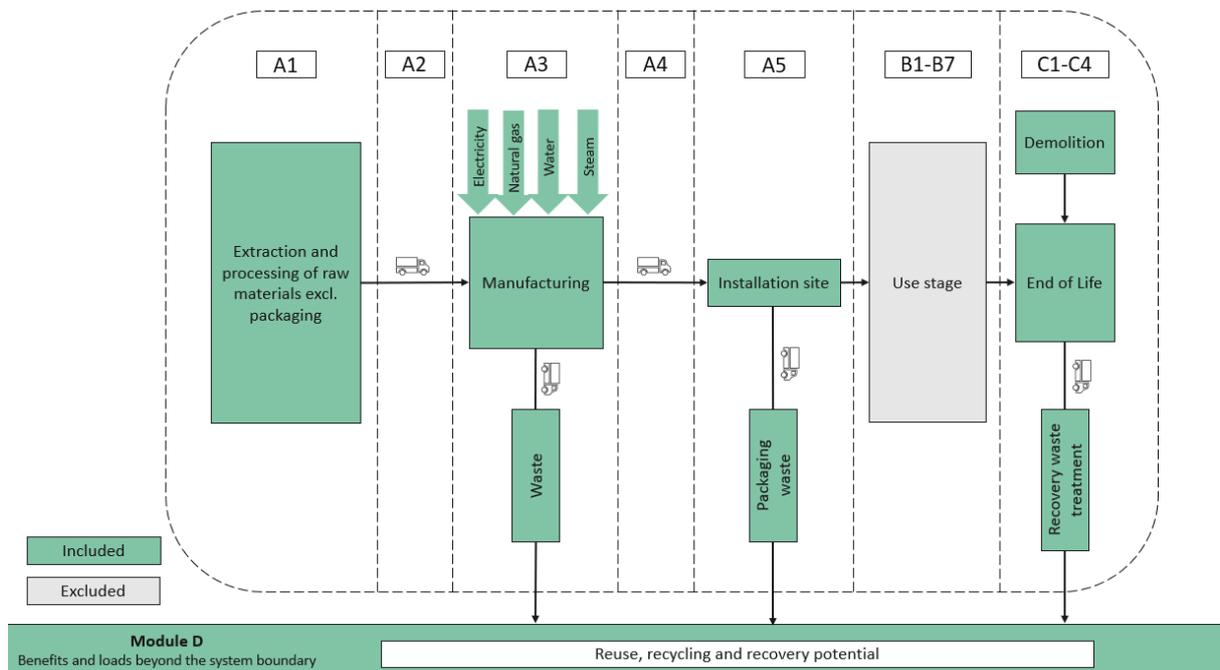


Figure 1: System boundary

More information

A1-A3 Raw materials and manufacturing stage

A1: This module includes the extraction and initial production of raw materials used to manufacture copper pipes and their packaging. The product consists of copper. The pipes included in this study are sourced from manufacturing plant in GB. The packaging material is PVC; however, due to its minimal quantity and negligible impact, it has been excluded in accordance with the cut-off rule.

A2: This module covers the transportation of raw materials to the manufacturing site. The manufacturer provided specific information on the transportation distances between the raw material sources and the factory. Detailed data sets for transportation routes are provided in Table 4.

Table 4: Detailed data sets for transportation routes A2

Row Material	Transportation type	Distance (km)
Copper Cathode	Truck	376
Copper Cathode	Ship	202
Copper scrap	Truck	43
Row Packaging Material	Transportation type	Distance (km)
PVC	Truck	95

A3: This stage includes resources used during the manufacturing process of the copper pipes as well as the manufacturing of the packaging material. The packaging material is PVC. However, because the amount used is small and its impact is negligible, it has been excluded based on the cut-off rule. After production, the pipes are transported to distribution centers in Sweden before reaching the final customers. Detailed data sets for energy and resource inputs and transportation routes are provided in following tables.

Table 5: Detailed data sets for transportation type A3

Type	Type of vehicle	Capacity utilisation (incl. return) %	Fuel/Energy consumption
Truck	Average truck trailer with a 27 t payload	61%	EU 28: Diesel mix (9.40 wt.% bio components)
Ship	Container ship, 5,000 to 200,000 dwt payload capacity, deep sea	70%	Heavy fuel oil at refinery (1.0wt.% S)

Table 6: Detailed data sets for transportation routes A3

Product	Transportation type	Distance (km)
		Sweden
Pipe +packaging	Truck	383
	Ship	935

Table 7: Detailed data sets for energy and resource inputs A3

Resources	Unit	GWP excl biogenic
Electricity	kWh	0,487 kg CO ₂ eq
Natural gas	MJ	0,0695 kg CO ₂ eq
Water	L	8,09e-5 kg CO ₂ eq

Electricity used in manufacturing:

The electricity used in the modelling is based on the energy mix of GB from International Energy Agency (2023). The GWP-GHG values for coefficient of energy mix of GB is 0, 487 kg CO₂-eq./kWh.

A4 Transport to construction process stage

It assumes an extra 350 km as generic data for transportation by truck to the installation site in Sweden. Detailed data sets for these transportation routes are provided in Table 8.

Table 8: Transport to the building site - A4

Scenario information	Unit per DU
Fuel type and consumption of vehicle or vehicle type	Truck-trailer, Euro 0 - 6 mix, 34 - 40t gross weight
Distance [km]	350
Fuel/Energy consumption value [l/tkm]	EU 28: Diesel mix (9.40 wt.% bio components)
Capacity Utilisation (including empty returns) [%]	61
Volume capacity	1

A5 Installation

This stage includes the installation of the product as well as the waste management of the packaging material that enters the system. The installation is assumed to be done by hand, thus the impact from the installation is negligible. The mass of packaging for disposal is not considered in accordance with the cut-off rules.

B1-B7 Use stage

This stage includes no activities or emissions related to the product.

C1 Deconstruction

The deconstruction phase (Module C1) accounts for the energy required to dismantle or remove the product at the end of its life. In the case of copper pipes has been assumed that the deconstruction of the products is done manually. Therefore, the impact is considered negligible.

C2 Transport

The following tables show the transportation type and fuel of the transport to a waste management facility. Transport distance to waste processing is assumed to be 50 km.

Table 9 Transport type - C2

Transportation type	Capacity utilisation (incl. return) %	Dataset
Truck	61	Truck-trailer, Euro 0 - 6 mix, 34 - 40t gross weight / 27t payload capacity

C3 Waste processing

The waste rate of the product in this scenario is shown in Table 12. The assumption is based on Swedish statistics (Naturvardsverket). It is believed that this scenario is currently in use and representative of the assumptions used in this study.

Table 10 Waste treatment rates – C3-C4

Material	Recycling rate	Incineration rate	Landfill rate
Copper	70%	0%	30%

C4 waste disposal

The impacts of landfilling and final disposal of the product at its end of life are calculated. Due to consideration of collection and recycling efficiencies, the materials that are not processed are assumed to be landfilled as municipal solid waste.

100% scenarios

In addition to the most probable end-of-life stage scenario, 100% scenarios have been modelled to give other perspectives. The 100% scenarios have been modelled in accordance with the default values given in table 4 of PCR2019:14 Version 2.0, to complement other processes in the end-of-life stage.

D Benefits and loads beyond the system boundary

This module includes loads and benefits obtained from energy recovery and/or recycling materials.

More information

This module defines the key concepts, objectives, and activities covered within its framework. Its geographical scope specifies the regions or countries where the module’s principles and practices are applicable.

Table 11: Modules declared and geographical scope

	Product stage			Assembly stage		Use stage							End of life stage				Benefits & loads beyond system boundary
	Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Modules	A1	A2	*A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	GB	GB	EU	EU	SE	-	-	-	-	-	-	-	SE	SE	SE	SE	SE
**Specific data used	5%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation products	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

* This is an EPD for a trader, the transportation from the plant to Sweden is included in A3. Therefore, this part has the geography EU.

** The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data, to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.

Declaration of data sources, reference years, and share of primary data

Table 12: data sources, reference years, and share of primary data

Process	Source type	Reference year	Source	Data category	Share of primary data, of GWP-GHG results for A1-A3
Production of raw material	Database	2024	Ecoinvent v3.10 + Sphera	Primary data, secondary data	0%
Transport of raw material to manufacturing site	Database + Collected data	2024	Sphere+ EPD owner	Primary data	<1%
Transport of components to warehouse	Database + Collected data	2024	Sphere+ EPD owner	Primary data	<1%
Manufacturing of product	Collected data	2024	EPD owner	Primary data and Secondary data	4.63%
Manufacturing of packaging	Database + Collected data	2024	Sphere+ EPD owner	Primary data and Secondary data	0%
Total share of primary data, of GWP-GHG results for A1-A3					5%

The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data, to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.

Summary of data quality

Table 13: data quality

Aspect	Description	Assessment / Justification
Data collection period	Primary data collected for January – December 2024.	Represents a full 12-month operational period. No deviations from the recommended one-year data collection period.
Type of data	Primary data from the manufacturer (energy, material inputs, emissions, waste, water). Secondary data from recognized databases for upstream and downstream processes.	Primary data measured or metered on site. Secondary data sourced from Ecoinvent v3.10 and GaBi 2024, representing British or European average conditions where available.
Geographical representativeness	GB – manufacturing site for copper pipes.	Primary data reflect actual British production. Secondary datasets are regionally or globally representative where no British data exist.
Technological representativeness	Current production technology for copper pipes	Reflects actual process configuration, equipment, and energy mix used at the facility.
Temporal representativeness	Reference year 2024; secondary data published within the last five years.	Data reflect present conditions; no outdated datasets used.
Completeness	All significant input and output flows included (> 99 % mass and energy coverage).	Coverage sufficient for reliable results; no major data gaps identified.
Consistency	Uniform system boundaries, cut-off criteria, and allocation rules applied across all datasets.	Modelling follows EN 15804 and EN 15941 requirements.
Precision / uncertainty	Primary data measured directly; secondary data with documented data-quality indicators.	Overall uncertainty is low and acceptable for EPD purposes.
Data-quality assessment result	—	Overall data quality: GOOD, in accordance with EN 15941:2024 § 7.3.3 and Annex C.
Overall data quality		Good

The data quality is assessed as *good*. Primary data were collected directly from the British manufacturing site over a complete one-year period and reflect actual operational conditions. Secondary data were taken from

established and quality-checked databases, representing appropriate regional and technological conditions. Together, these datasets ensure high representativeness, completeness, and consistency, meeting the requirements of EN 15941:2024.

Environmental performance

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. As module C is included in the EPD, it is discouraging the use of the results of modules A1-A3 without considering the results of module C.

Mandatory impact category indicators according to EN 15804, EF 3.1

Results per declared unit: 1 kg									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO2 eq	5,35E+00	2,75E-02	0,00E+00	0,00E+00	7,67E-03	1,20E+00	1,09E-01	-1,66E+00
GWP-fossil	kg CO2 eq	5,29E+00	2,70E-02	0,00E+00	0,00E+00	7,52E-03	1,20E+00	1,09E-01	-1,60E+00
GWP-biogenic	kg CO2 eq	1,09E-02	7,45E-05	0,00E+00	0,00E+00	2,14E-05	2,50E-03	8,14E-05	-4,33E-03
GWP-luluc	kg CO2 eq	4,81E-02	4,47E-04	0,00E+00	0,00E+00	1,25E-04	1,83E-03	4,15E-05	-5,13E-02
ODP	kg CFC-11 eq	2,32E-08	2,68E-15	0,00E+00	0,00E+00	1,10E-15	1,24E-08	5,35E-10	5,95E-09
AP	mole H+ eq	1,02E-01	3,03E-05	0,00E+00	0,00E+00	1,01E-05	6,86E-02	3,47E-04	-3,72E-02
EP-freshwater	kg P eq	2,46E-03	1,13E-07	0,00E+00	0,00E+00	3,18E-08	2,12E-04	1,39E-06	-1,39E-05
EP-marine	kg N eq	2,32E-02	1,01E-05	0,00E+00	0,00E+00	3,78E-06	2,94E-03	1,01E-04	-4,76E-03
EP-terrestrial	mole N eq	3,32E-01	1,23E-04	0,00E+00	0,00E+00	4,39E-05	4,02E-02	1,15E-03	-5,12E-02
POCP	kg NMVOC eq	6,92E-02	2,83E-05	0,00E+00	0,00E+00	1,02E-05	1,26E-02	3,35E-04	-1,35E-02
ADP-minerals & metals ²	kg Sb eq	2,30E-03	2,26E-09	0,00E+00	0,00E+00	6,48E-10	8,80E-04	2,79E-07	-1,66E-03
ADP-fossil ²	MJ	6,88E+01	3,47E-01	0,00E+00	0,00E+00	9,80E-02	1,91E+01	7,44E-01	-2,59E+01
WDP	m ³	3,20E+00	3,96E-04	0,00E+00	0,00E+00	1,15E-04	1,28E+00	1,35E-02	-2,15E+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								

² The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator

Use of resources

Results per declared unit: 1 kg									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	2,20E+01	2,93E-02	0,00E+00	0,00E+00	8,44E-03	4,03E+00	2,81E-02	-1,02E+01
PERM ³	MJ	0,00E+00							
PERT	MJ	2,20E+01	2,93E-02	0,00E+00	0,00E+00	8,44E-03	4,03E+00	2,81E-02	-1,02E+01
PENRE	MJ	6,88E+01	3,47E-01	0,00E+00	0,00E+00	9,80E-02	1,91E+01	7,44E-01	-2,59E+01
PENRM	MJ	0,00E+00							
PENRT	MJ	6,88E+01	3,47E-01	0,00E+00	0,00E+00	9,80E-02	1,91E+01	7,44E-01	-2,59E+01
SM	kg	1,00E+00	0,00E+00						
RSF	MJ	0,00E+00							
NRSF	MJ	0,00E+00							
FW	m3	6,57E-02	3,30E-05	0,00E+00	0,00E+00	9,41E-06	2,99E-02	3,15E-04	-3,95E-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								

³ Option A was chosen for the calculations of the primary energy indicators according to on Annex 3 of PCR 2019:14.

Additional voluntary indicators

Results per declared unit: 1 kg									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-GHG ⁴	kg CO2 eq	5,31E+00	2,73E-02	0,00E+00	0,00E+00	7,61E-03	1,19E+00	1,08E-01	-1,65E+00
PM	Disease incidences	8,61E-07	2,77E-10	0,00E+00	0,00E+00	9,93E-11	1,44E-07	3,36E-09	-3,29E-07
IRP	kBq U235 eq.	1,67E-01	6,26E-05	0,00E+00	0,00E+00	2,59E-05	7,90E-02	4,50E-04	-9,18E-02
ETP-fw	CTUe	5,91E+02	2,55E-01	0,00E+00	0,00E+00	7,28E-02	5,27E+01	2,58E+01	-1,60E+01
HTP-c	CTUh	3,71E-08	5,12E-12	0,00E+00	0,00E+00	1,47E-12	1,54E-08	1,67E-10	-1,30E-09
HTP-nc	CTUh	2,17E-07	2,28E-10	0,00E+00	0,00E+00	6,60E-11	8,89E-07	7,99E-08	-1,00E-07
SQP	Pt	6,06E+01	1,72E-01	0,00E+00	0,00E+00	4,82E-02	2,51E+01	6,88E-01	-8,19E+00
Acronyms	GWP-GHG = Global warming potential - greenhouse gases PM = Particulate matter emissions ; IRP = Ionising radiation, human health; ETP-fw =Ecotoxicity (freshwater); ETP-c = Human toxicity, cancer effects; HTP-nc =Human toxicity, non-cancer effects; SQP = Land use related impacts / soil quality								

Waste and output flows

Waste

Results per declared unit: 1 kg									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	5,30E-01	1,12E-11	0,00E+00	0,00E+00	3,75E-12	2,65E-01	6,01E-01	1,18E+00
NHWD	kg	4,23E+01	5,40E-05	0,00E+00	0,00E+00	1,60E-05	2,52E+01	8,49E-01	1,63E+00
RWD	kg	9,56E-04	4,49E-07	0,00E+00	0,00E+00	1,79E-07	5,85E-05	2,88E-07	-8,96E-04
Acronyms	HW = Hazardous waste disposed; NHW = Non-hazardous waste disposed; RW = Radioactive waste disposed								

⁴ This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO2 is set to zero

Output flows

Results per declared unit: 1 kg									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
CRU	kg	0,00E+00							
MFR	kg	1,29E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,00E-01	0,00E+00	0,00E+00
MER	kg	0,00E+00							
EEE	MJ	0,00E+00							
EET	MJ	0,00E+00							
Acronyms	CRU = Components for reuse; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electric energy; ETE = Exported thermal energy								

Information on biogenic carbon content

Biogenic carbon content	Unit per declared unit	Amount
Biogenic carbon content in product	kg C	0,00E+00
Biogenic carbon content in packaging	kg C	0,00E+00

1 kg biogenic carbon is equivalent to 44/12 kg CO₂.

Additional Environmental Performance

In addition to the most probable scenario, results from the corresponding 100% scenarios are added in this section.

Mandatory impact category indicators according to EN 15804, EF 3.1

Results per declared unit: 1 kg										
Indicator	Unit	C1 100%	C2 100% RC	C2 100% LF	C3 100% RC	C3 100% LF	C4 100% RC	C4 100% LF	D 100% RC	D 100% LF
GWP-total	kg CO2 eq	0,00E+00	7,67E-03	7,67E-03	1,72E+00	0,00E+00	0,00E+00	3,62E-01	-2,37E+00	0,00E+00
GWP-fossil	kg CO2 eq	0,00E+00	7,52E-03	7,52E-03	1,71E+00	0,00E+00	0,00E+00	3,62E-01	-2,29E+00	0,00E+00
GWP-biogenic	kg CO2 eq	0,00E+00	2,14E-05	2,14E-05	3,58E-03	0,00E+00	0,00E+00	2,71E-04	-6,19E-03	0,00E+00
GWP-luluc	kg CO2 eq	0,00E+00	1,25E-04	1,25E-04	2,61E-03	0,00E+00	0,00E+00	1,38E-04	-7,33E-02	0,00E+00
ODP	kg CFC-11 eq	0,00E+00	1,10E-15	1,10E-15	1,77E-08	0,00E+00	0,00E+00	1,78E-09	8,50E-09	0,00E+00
AP	mole H+ eq	0,00E+00	1,01E-05	1,01E-05	9,80E-02	0,00E+00	0,00E+00	1,16E-03	-5,32E-02	0,00E+00
EP-freshwater	kg P eq	0,00E+00	3,18E-08	3,18E-08	3,03E-04	0,00E+00	0,00E+00	4,64E-06	-1,98E-05	0,00E+00
EP-marine	kg N eq	0,00E+00	3,78E-06	3,78E-06	4,20E-03	0,00E+00	0,00E+00	3,37E-04	-6,79E-03	0,00E+00
EP-terrestrial	mole N eq	0,00E+00	4,39E-05	4,39E-05	5,75E-02	0,00E+00	0,00E+00	3,83E-03	-7,31E-02	0,00E+00
POCP	kg NMVOC eq	0,00E+00	1,02E-05	1,02E-05	1,80E-02	0,00E+00	0,00E+00	1,12E-03	-1,92E-02	0,00E+00
ADP-minerals & metals ⁵	kg Sb eq	0,00E+00	6,48E-10	6,48E-10	1,26E-03	0,00E+00	0,00E+00	9,31E-07	-2,37E-03	0,00E+00
ADP-fossil ²	MJ	0,00E+00	9,80E-02	9,80E-02	2,74E+01	0,00E+00	0,00E+00	2,48E+00	-3,71E+01	0,00E+00
WDP ²	m3	0,00E+00	1,15E-04	1,15E-04	1,83E+00	0,00E+00	0,00E+00	4,51E-02	-3,07E+00	0,00E+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									

RE – recycling, INC – incineration, LF - landfill

⁵ The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator

Use of resources

Results per declared unit: 1 kg										
Indicator	Unit	C1 100%	C2 100% RC	C2 100% LF	C3 100% RC	C3 100% LF	C4 100% RC	C4 100% LF	D 100% RC	D 100% LF
PERE	MJ	0,00E+00	8,44E-03	8,44E-03	5,76E+00	0,00E+00	0,00E+00	9,36E-02	-1,46E+01	0,00E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	0,00E+00	8,44E-03	8,44E-03	5,76E+00	0,00E+00	0,00E+00	9,36E-02	-1,46E+01	0,00E+00
PENRE	MJ	0,00E+00	9,80E-02	9,80E-02	2,74E+01	0,00E+00	0,00E+00	2,48E+00	-3,71E+01	0,00E+00
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	0,00E+00	9,80E-02	9,80E-02	2,74E+01	0,00E+00	0,00E+00	2,48E+00	-3,71E+01	0,00E+00
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	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	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	0,00E+00	0,00E+00	0,00E+00
FW	m3	0,00E+00	9,41E-06	9,41E-06	4,27E-02	0,00E+00	0,00E+00	1,05E-03	-5,65E-02	0,00E+00
Acronyms	<p>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</p>									

Additional voluntary indicators

Results per declared unit: 1 kg										
Indicator	Unit	C1 100%	C2 100% RC	C2 100% LF	C3 100% RC	C3 100% LF	C4 100% RC	C4 100% LF	D 100% RC	D 100% LF
GWP-GHG ⁶	kg CO2 eq	0,00E+00	7,61E-03	7,61E-03	1,71E+00	0,00E+00	0,00E+00	3,61E-01	-2,36E+00	0,00E+00
Acronyms	GWP-GHG = global warming potential - greenhouse gases									

Waste and output flows

Waste

Results per declared unit: 1 kg										
Indicator	Unit	C1 100%	C2 100% RC	C2 100% LF	C3 100% RC	C3 100% LF	C4 100% RC	C4 100% LF	D 100% RC	D 100% LF
HWD	kg	0,00E+00	3,75E-12	3,75E-12	3,79E-01	0,00E+00	0,00E+00	2,00E+00	1,69E+00	0,00E+00
NHWD	kg	0,00E+00	1,60E-05	1,60E-05	3,59E+01	0,00E+00	0,00E+00	2,83E+00	2,33E+00	0,00E+00
RWD	kg	0,00E+00	1,79E-07	1,79E-07	8,36E-05	0,00E+00	0,00E+00	9,60E-07	-1,28E-03	0,00E+00
Acronyms	HW = Hazardous waste disposed; NHW = Non-hazardous waste disposed; RW = Radioactive waste disposed									

⁶ This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO2 is set to zero

Output flows

Results per declared unit: 1 kg										
Indicator	Unit	C1 100%	C2 100% RC	C2 100% LF	C3 100% RC	C3 100% LF	C4 100% RC	C4 100% LF	D 100% RC	D 100% LF
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	1,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Acronyms	CRU = Components for reuse; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electric energy; EET = Exported thermal energy									

Disclaimers

Table 14: Disclaimers

ILCD classification	Indicator	Disclaimer
ILCD Type 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD Type 2	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
	Potential Human exposure efficiency relative to U235 (IRP)	1
ILCD Type 3	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted	2
	Water consumption (WDP)	2
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2
	Potential Soil quality index (SQP)	2
<p>Disclaimer 1 – 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.</p> <p>Disclaimer 2 – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.</p>		

Additional information

This study applies a market-based approach for electricity modelling. The electricity mix used, shown in Figure 2, reflects the British grid mix relevant to the location of the manufacturing processes. Residual mix data was sourced from the Association of Issuing Bodies – AIB report (2024) to ensure alignment with market-based electricity accounting.

Table 15: Electricity mix used in production

Residual mix	Unit	Value
Location		Great Britain (GB)
Electricity mix		Biomass: 0.34 % Hard coal: 19.40 % Heavy Fuel Oil: 1.42 % Hydro: 0.65 % Natural gas: 46.84 % Nuclear: 23.86 % Photovoltaic: 1.49 % Wind: 0.80 %
Reference year		2024
Source		AIB Great Britain (GB) Residual Mixes 2024
GWP excl. Biogenic	kg CO ₂ -eq. /kWh	0, 487

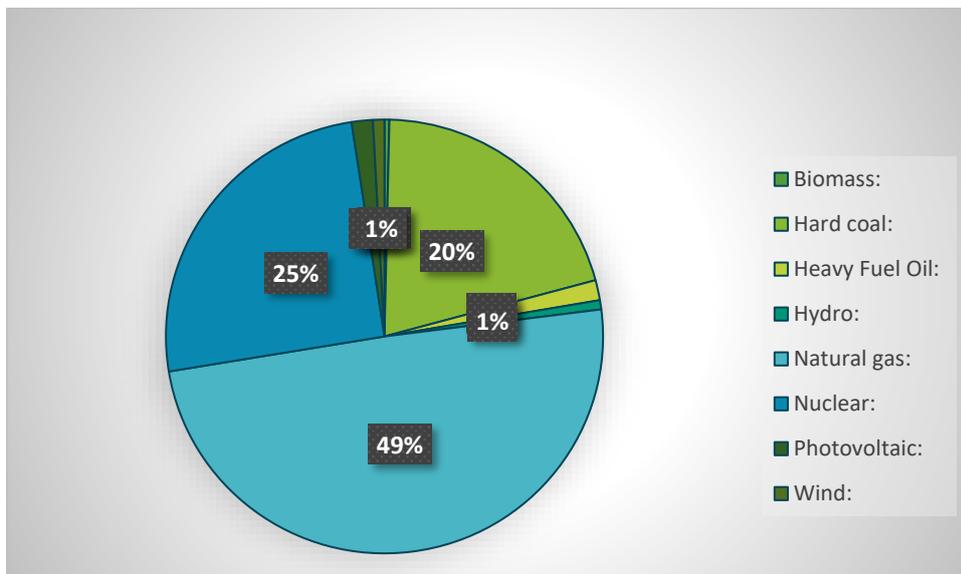


Figure 2: Electricity mix used in production

The summary of the end-of-life scenario is presented in Table 16, in accordance with EN 15804 requirements. The table outlines the key assumptions and parameters applied for the end-of-life stage, including waste processing routes, recovery, recycling, and disposal scenarios considered in the assessment.

Table 16: End of the life (C1-C4) scenario documentation

Scenario parameter	Value
Collection process – kg collected separately	1
Collection process – kg collected with mixed waste	-
Recovery process – kg for re-use	-
Recovery process – kg for recycling	0,7
Recovery process – kg for energy recovery	-
Disposal (total) – kg for final deposition	0,3
Scenario assumptions (e.g. transportation): Dismantled product is transported (km)	50

Abbreviations

General

- **EPD** – Environmental Product Declaration
- **LCA** – Life Cycle Assessment
- **PCR** – Product Category Rules
- **ISO** – International Organization for Standardization
- **EN** – European Norm
- **UN CPC** – United Nations Central Product Classification

Environmental Impact and LCA Metrics

- **GWP** – Global Warming Potential
- **GWP-GHG** – Global Warming Potential (Greenhouse Gas-specific)
- **PM** – Particulate Matter
- **ODP** – Ozone Depletion Potential
- **AP** – Acidification Potential
- **EP** – Eutrophication Potential
- **POCP** – Photochemical Ozone Creation Potential
- **IRP** – Ionizing Radiation Potential
- **ETP-fw** – Ecotoxicity Potential (Freshwater)
- **HTP-c** – Human Toxicity Potential (Cancer)
- **HTP-nc** – Human Toxicity Potential (Non-Cancer)
- **SQP** – Soil Quality Potential

Energy and Waste Metrics

- **PERE** – Primary Energy, Renewable
- **PERM** – Primary Energy, Renewable (Material Use)
- **PERT** – Total Use of Renewable Primary Energy
- **PENRE** – Primary Energy, Non-Renewable
- **PENRM** – Primary Energy, Non-Renewable (Material Use)
- **PENRT** – Total Use of Non-Renewable Primary Energy
- **SM** – Secondary Material
- **RSF** – Renewable Secondary Fuels
- **NRSF** – Non-Renewable Secondary Fuels
- **FW** – Fresh Water Use
- **HWD** – Hazardous Waste Disposed
- **NHWD** – Non-Hazardous Waste Disposed
- **RWD** – Radioactive Waste Disposed
- **CRU** – Components for Reuse
- **MFR** – Materials for Recycling

- **MER** – Materials for Energy Recovery
- **EEE** – Exported Electrical Energy
- **EET** – Exported Thermal Energy

Software and Databases

- **GaBi** – LCA Software by Sphera)
- **Ecoinvent** – Life Cycle Inventory Database
- **CUP2023.2** – Version of the Ecoinvent Database

References

Ecoinvent (2024)	Ecoinvent dataset version 3.10 (2024)
EN15804:2012+A2:AC/2021	Sustainability of construction works – Environmental product declaration – Core rules for the product category of constructions products
EPD International (2024)	General Programme Instructions of the International EPD® System, version 5.0
ISO 14020:2022	International Standard ISO 14020 – Environmental statements and programmes for products – Principles and general requirements
ISO 14025:2006	International Standard ISO 14025 – Environmental labels and declarations — Type III environmental declarations — Principles and procedures
ISO 14040:2006	International Standard ISO 14040: Environmental Management – Life cycle assessment – Principles and framework. Second edition 2006-07-01.
ISO 14044:2006	International Standard ISO 14044: Environmental Management – Life cycle assessment – Requirements and Guidelines
Association of Issuing Bodies (AIB)	AIB Great Britain (GB) Residual Mixes 2024
PCR 2019:14	Construction products v 2.0.1
Naturvardsverket, 2025	https://www.naturvardsverket.se/
Sphera (2024)	Sphera (2024) LCA for Experts. MLC database CUP 2023.2

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