ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Biddle SR Hydronic air curtain

EPD of multiple products, based on the representative **SR M-200-H3**.

Products include:

SR Hydronic			
S	M	L	XL
SR S-100-H3	SR M-100-H3	SR L-100-H3	SR XL-100-H3
SR S-150-H3	SR M-150-H3	SR L-150-H3	SR XL-150-H3
SR S-200-H3	SR M-200-H3	SR L-200-H3	SR XL-200-H3
SR S-250-H3	SR M-250-H3	SR L-250-H3	SR XL-250-H3

EPD HUB, EPD number HUB-4941

Published on 21.01.2026, last updated on 21.01.2026, valid until 20.01.2031

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	Biddle
Address	Markowei 4, 9288 HA, Kootstertille, The Netherlands
Contact details	info@biddle.nl
Website	www.Biddle.nl

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804+A2:2019 and ISO 14025
PCR	EPD Hub Core PCR Version 1.2, 24 Mar 2025
Sector	Electrical product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with options, A4-B7, and modules C1-C4, D
EPD author	Maurice Pathuis, Biddle
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Elma Avdyli, as authorized verifier acting for EPD HUB Limited

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	Biddle SR M-200-H3 Hydronic Air Curtain
Additional labels	
Product reference	64012311
Place(s) of raw material origin	EU
Place of production	Kootstertille, The Netherlands
Place(s) of installation and use	EU
Period for data	Calendar year 2024
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3 (%)	-32,9 / +48,7
A1-A3 Specific data (%)	4,72

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 unit of Biddle SR Hydronic Air Curtain
Declared unit mass	97,7 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	1,15E+03
GWP-total, A1-A3 ($kgCO_2e$)	1,10E+03
Secondary material, inputs (%)	47
Secondary material, outputs (%)	68,4
Total energy use, A1-A3 (kWh)	4850
Net freshwater use, A1-A3 (m^3)	18,3

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Biddle is a leader of air diffusion technologies and has been delivering innovative climate solutions in the field of heating, ventilation, cooling and climate separation for nearly 100 years. Biddle manufacture a range of air curtains, air heaters, cassette units, heat recovery and fan coils and supply the largest retailers and businesses with highly efficient climate separation and climate control solutions across Europe and North America. Patented technologies, innovative products, our highly regarded service and after sales support ensure you have the right partner throughout your project implementation.

PRODUCT DESCRIPTION

The SR air curtain has been developed to deliver greater comfort than a conventional air curtain, whilst providing considerable energy savings. The SR does not act as a barrier in the place of an open door, but it reduces the amount of warm air leaving the building and conditions the incoming air to a comfortable temperature. The SR air curtain delivers the right air flow and temperature at the right time automatically, ensuring optimal climate separation and reducing energy loss and offers a unique air damper system to improve efficiency by controlling the outlet velocity.
The impressive results achieved by the SR are made possible thanks to a combination of four technologies. The revolutionary patented i-sense infrared technology collects all temperature related data in the doorway. CHIPS technology translates this information into the correct setting, whilst the adaptable discharge width (Controlled Air strength technology) and the patented rectifier technology create the perfect climate separation.
The SR can be supplied to suit many heating mediums, with water (hydronic), electric, a combination of low grade water and electric (Hybrid) and ambient models all being available.
The SR is designed for door heights from 2.0 to 4.0 m and is mounted horizontally above door openings in shopping malls, shops, stores, supermarkets and other commercial spaces.
This EPD is for an SR unit which is hydronic (H3) and 200cm in width. (SR M-200-H3)

The EPD is applicable for the following units:
SR S-100-H3, SR S-150-H3, SR S-200-H3, SR S-250-H3, SR M-100-H3, SR M-150-H3, SR M-200-H3, SR M-250-H3, SR L-100-H3, SR L-150-H3, SR L-200-H3, SR L-250-H3, SR XL-100-H3, SR XL-150-H3, SR XL-200-H3, SR XL-250-H3

The casing is made of zinc plated sheet steel and has an inspection panel in the bottom. The inlet grilles are made of anodised aluminium with fixed fins. The inlet module and the end panels as well as the casing are, as a standard, supplied in silver grey (RAL 9006) or traffic white (RAL 9016).
The air curtain is equipped with two or more (depending on type) dual-inlet, vibration free suspended centrifugal fans.
The SR H3 units are made up of heat exchanger elements with aluminium fins and copper tubing. The exchanger is controlled by the electronic control unit and is fitted with overload protection.

Further information can be found at: www.Biddle.nl

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	72	EU
Minerals	-	-
Fossil materials	-	-
Bio-based materials	-	-
Electronics	28	EU

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	15,16205064

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 unit of Biddle SR M-200-H3 Hydronic Air Curtain
Mass per declared unit	97,7 kg
Functional unit	1 Unit of Biddle SR Hydronic air curtain, with a min./max.; heating capacity 2.2 / 66kw, air volume 440 / 9870m3/hour, door widths 100 / 250cm, door heights 200 / 400cm
Reference service life	15

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	x	x	x	x	x	x	x	x	x	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

Modules not declared = ND. Modules not relevant = MNR

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.

The reference product consists of one indoor unit that is made of metals, fans. and electronic components. The materials are either transported to Biddle's offsite warehouse and then to the production facility (leg 2 transport) or directly to the production facility.
The main manufacturing processes include CNC-punching, hydraulic press-braking, spotwelding and some powdercoating before being assembled and packed onsite.

Products do not use or contain any refrigerants.
There are no ancillaries used in our production processes.

The manufacturing process requires electricity and natural gas for different equipment as well as heating of the factory and offices.
The manufacturing electricity used is based on a 100% wind energy contract.
The study considers the losses of main raw materials (steel) occurring during the manufacturing process.
Each part manufacturing process is considered separately and process waste disposal is accounted based on allocation of factory-site. The finished product is packaged in cardboard before being sent to the installation site on a wooden pallet with steel fixings for stability in transit.

The use of green energy in manufacturing is demonstrated through contractual instruments (GOs, RECs, etc.), and its use is ensured throughout the validity period of this EPD.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

A sales volume-based weighted average is considered for defining the distribution to the customer. Average distance of transportation from production plant to customer is as described below (A4). This data is based on actual in 2024 and weighted for sales volume.
Sales market largely consists of western & central European countries.
Average scenario data was used (euro6 diesel lorry for transport) when it comes to capacity utilisation and empty returns, as per the background data from ecoinvent.
Transportation does not cause losses as the products are packaged properly.
Transportation impacts that occur from delivery of the product cover direct exhaust emissions of fuel, environmental impacts of fuel production, as well as related infrastructure emissions.
Environmental impacts from installation (A5) into the building are considered negligible but does include waste packaging materials and release of biogenic carbon dioxide from waste processing of cardboard and wood pallets.

PRODUCT USE AND MAINTENANCE (B1-B7)

Electricity used by this product depends on a large amount of variables, such as building location, orientation, surroundings, technical conditions of doorway, desired indoor temperature, doorway traffic etc.

However, in order to make an conservative estimate, calculations have been made in order to give insight into the footprint of the product.
The calculation was made on these following parameters; opening hours for retail at 80 hours per week for 50 weeks per year for a reference service life of 15 years, an average power consumption of the fans of 0.3734kW. As this is a hydronic unit, the unit itself does not produce heat nor does it pump water. Electricity usage is merely calculated for the fans.
Average low voltage electricity in Europe was used as the dataset.
No replacement of components or parts are included.
Air, soil, and water impacts during the use phase have not been studied.

Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

It is assumed that no energy and additional material are needed for the dismantling of the product. (C1)

Consumption of energy and natural resources in deconstruction process is assumed to be negligible. It is assumed that the waste is collected separately and transported to the waste treatment center. Transportation distance to treatment is assumed as 50 km for landfill and 250 km for metal recycling, the transportation method is assumed to be lorry (C2).
As per WEEE data, all electronics are shredded and it's material content recycled or landfilled. (C3)
According to EN 50693:2019, the sequence of treatment operations occurring to the product shall include de-pollution, fractions separation and preparation (dismantling, crushing, shredding, sorting), recycling, other material recovery, energy recovery and disposal. In this study,

the default values from table G.4 of EN 50693 is used for treating materials in different waste treatment methods.

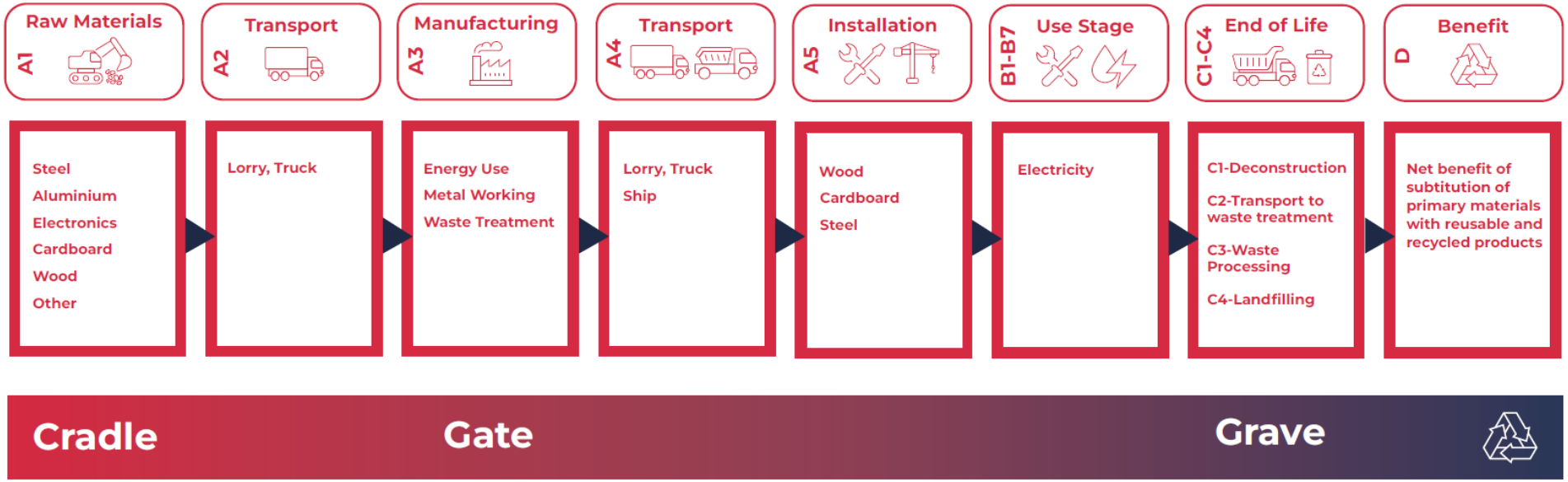
As per EN 50693, 80% of ferrous metals, 70% of aluminium and 60% of copper are recycled (EU) all including those materials from WEEE shredding, are recycled (EU). (C3)

When it comes to remaining percentages, 20% of ferrous metals, 30% of aluminium and 40%, all including those materials from WEEE shredding, goes to landfill (EU). (C4)
Plastics that come from WEEE shredding are 100% landfilled (EU). (C4)

Module C3 accounts for energy and resource inputs for sorting and treating these waste streams for recycling and landfill.

Due to the material and energy recovery potential of parts in the end of life product and packaging, recycled raw materials leads to avoided virgin material production, while the energy recovered from incineration displaces electricity and heat production (D). The benefits and loads of incineration and recycling are included in Module D.

SYSTEM DIAGRAM



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.

All industrial processes from raw material acquisition and pre-processing, production, product distribution, installation, use/application of product and end-of-life management are included. For easier modelling and because of lack of accuracy in available modelling resources many constituents under 0,1% of product mass are excluded. These include some ancillary materials which are used in the production only in very small amounts and have no serious impact on the emissions of the product. Further, water used for cleaning and the maintenance of capital equipment, transportation and waste streams of the packaging materials used for delivering the raw materials to the factory are omitted since the quantified mass contribution is less than 0.1%.

The BOM data accounted for 98,9% of the product mass. The excluded materials/components are well below cut-off and deemed not to have a significant contribution to the environmental impact.

To be conservative, the masses were scaled proportionally to 100%.

Grouped products have been calculated from the scaled masses.

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. 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	No allocation
Ancillary materials	Not applicable
Manufacturing energy and waste	Allocated by mass or volume

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	Multiple products
Grouping method	Not applicable
Variation in GWP-fossil for A1-A3, %	-32,9 / +48,7

Please note that A1-A3 is only a small percentage of the total GWP in the service life of the units.

This EPD covers multiple models in the Hydronic SR range and is based on the SR M-200-H3.
This model was chosen as representative model because it's technically in centre of the full range of products and the bestselling product.

The EPD is applicable for the following units:

Model	Weight (kg)
SR S-100-H3	46
SR S-150-H3	65
SR S-200-H3	79
SR S-250-H3	102
SR M-100-H3	52
SR M-150-H3	74
SR M-200-H3(DU)	98
SR M-250-H3	114
SR L-100-H3	64
SR L-150-H3	96
SR L-200-H3	121
SR L-250-H3	154
SR XL-100-H3	68
SR XL-150-H3	102
SR XL-200-H3	130
SR XL-250-H3	163

Please find more detail on variation in GWP-fossil of the listed products in the annex.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. 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 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1/3.11 environmental data sources follow the methodology 'allocation, Cut-off, EN 15804+A2'.

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	1,08E+03	1,17E+01	6,14E+00	1,10E+03	1,17E+01	5,68E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,36E+03	0,00E+00	0,00E+00	3,47E+00	3,15E+00	4,71E-01	-1,70E+02
GWP – fossil	kg CO_2e	1,08E+03	1,17E+01	6,13E+01	1,15E+03	1,17E+01	1,21E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,33E+03	0,00E+00	0,00E+00	3,47E+00	3,14E+00	4,71E-01	-1,57E+02
GWP – biogenic	kg CO_2e	0,00E+00	0,00E+00	-5,56E+01	-5,56E+01	0,00E+00	5,56E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,53E-05	-1,06E-04	-1,50E-05	-1,11E+01
GWP – LULUC	kg CO_2e	2,09E+00	4,20E-03	4,38E-01	2,54E+00	4,19E-03	1,46E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,25E+01	0,00E+00	0,00E+00	1,25E-03	4,75E-03	2,35E-04	-1,46E+00
Ozone depletion pot.	kg $CFC\text{-}_{11}$e	3,12E-05	2,32E-07	2,18E-06	3,36E-05	2,32E-07	1,75E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,35E-04	0,00E+00	0,00E+00	6,91E-08	2,92E-08	6,97E-09	-1,45E-06
Acidification potential	mol H^+e	1,64E+01	2,44E-02	2,43E-01	1,66E+01	2,43E-02	6,11E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,31E+01	0,00E+00	0,00E+00	7,22E-03	2,68E-02	1,86E-03	-1,11E+00
EP-freshwater[2)]	kg Pe	1,14E+00	7,88E-04	1,12E-02	1,16E+00	7,85E-04	3,07E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,83E+00	0,00E+00	0,00E+00	2,34E-04	1,62E-03	3,87E-05	-2,87E-01
EP-marine	kg Ne	2,66E+00	5,90E-03	5,36E-02	2,72E+00	5,83E-03	7,16E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,76E+00	0,00E+00	0,00E+00	1,74E-03	5,66E-03	5,56E-03	-2,17E-01
EP-terrestrial	mol Ne	4,55E+01	6,37E-02	9,09E-01	4,65E+01	6,29E-02	2,34E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,06E+01	0,00E+00	0,00E+00	1,87E-02	6,31E-02	7,51E-03	-2,74E+00
POCP ("smog")[3)]	kg NMVOCe	4,68E+00	4,06E-02	1,86E-01	4,91E+00	4,04E-02	7,94E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,00E+01	0,00E+00	0,00E+00	1,20E-02	1,84E-02	2,63E-03	-7,51E-01
ADP-minerals & metals[4)]	kg Sbe	2,51E-01	3,89E-05	5,14E-04	2,51E-01	3,88E-05	5,02E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,90E-02	0,00E+00	0,00E+00	1,16E-05	1,20E-04	5,77E-07	-8,64E-03
ADP-fossil resources	MJ	1,36E+04	1,65E+02	9,48E+02	1,47E+04	1,64E+02	1,53E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,71E+05	0,00E+00	0,00E+00	4,88E+01	3,89E+01	6,03E+00	-1,85E+03
Water use[5)]	m^3e depr.	7,57E+02	8,18E-01	1,42E+01	7,72E+02	8,16E-01	4,06E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,65E+03	0,00E+00	0,00E+00	2,43E-01	6,87E-01	5,18E-02	-1,26E+02

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	1,48E-04	8,63E-07	2,80E-06	1,52E-04	8,60E-07	1,03E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,54E-04	0,00E+00	0,00E+00	2,56E-07	3,36E-07	4,06E-08	-1,54E-05
Ionizing radiation[6]	kBq U235e	1,38E+02	2,12E-01	2,43E+00	1,41E+02	2,12E-01	5,43E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,71E+03	0,00E+00	0,00E+00	6,30E-02	2,77E-01	6,47E-03	-1,75E+01
Ecotoxicity (freshwater)	CTUe	3,10E+04	2,19E+01	2,55E+02	3,12E+04	2,18E+01	1,54E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,60E+04	0,00E+00	0,00E+00	6,50E+00	1,70E+01	6,21E+02	-3,67E+03
Human toxicity, cancer	CTUh	1,38E-06	1,96E-09	5,61E-08	1,44E-06	1,96E-09	6,83E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,48E-06	0,00E+00	0,00E+00	5,83E-10	1,91E-09	1,35E-10	-1,18E-07
Human tox. non-cancer	CTUh	6,21E-05	1,04E-07	3,99E-07	6,26E-05	1,04E-07	3,60E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,29E-04	0,00E+00	0,00E+00	3,09E-08	1,36E-07	2,00E-08	8,66E-07
SQP[7]	-	6,04E+03	9,97E+01	3,72E+03	9,87E+03	9,92E+01	1,46E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,80E+04	0,00E+00	0,00E+00	2,95E+01	4,59E+01	1,12E+01	-6,13E+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	2,31E+03	2,88E+00	4,69E+02	2,78E+03	2,87E+00	-5,02E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,68E+04	0,00E+00	0,00E+00	8,55E-01	5,96E+00	9,69E-02	-4,47E+02
Renew. PER as material	MJ	0,00E+00	0,00E+00	4,84E+02	4,84E+02	0,00E+00	-4,84E+02	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	0,00E+00	0,00E+00	9,74E+01
Total use of renew. PER	MJ	2,31E+03	2,88E+00	9,53E+02	3,27E+03	2,87E+00	-9,86E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,68E+04	0,00E+00	0,00E+00	8,55E-01	5,96E+00	9,69E-02	-3,50E+02
Non-re. PER as energy	MJ	1,36E+04	1,65E+02	9,26E+02	1,47E+04	1,64E+02	1,53E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,71E+05	0,00E+00	0,00E+00	4,88E+01	3,89E+01	-7,87E+01	-1,86E+03
Non-re. PER as material	MJ	0,00E+00	0,00E+00	2,43E+01	2,43E+01	0,00E+00	-2,43E+01	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	0,00E+00	0,00E+00	6,36E+00
Total use of non-re. PER	MJ	1,36E+04	1,65E+02	9,50E+02	1,47E+04	1,64E+02	-9,03E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,71E+05	0,00E+00	0,00E+00	4,88E+01	3,89E+01	-7,87E+01	-1,85E+03
Secondary materials	kg	4,59E+01	7,64E-02	1,15E+01	5,75E+01	7,62E-02	1,34E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,82E+01	0,00E+00	0,00E+00	2,27E-02	2,96E-02	2,03E-03	5,15E+01
Renew. secondary fuels	MJ	1,01E-01	9,66E-04	1,31E+01	1,32E+01	9,64E-04	1,43E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,25E-01	0,00E+00	0,00E+00	2,87E-04	1,93E-03	3,65E-05	-1,50E-02
Non-ren. secondary fuels	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	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
Use of net fresh water	m^3	1,79E+01	2,24E-02	3,26E-01	1,83E+01	2,24E-02	-3,19E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,47E+02	0,00E+00	0,00E+00	6,65E-03	1,93E-02	-1,79E-02	-4,29E+00

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	1,98E+02	2,39E-01	3,27E+00	2,01E+02	2,39E-01	1,30E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,32E+02	0,00E+00	0,00E+00	7,10E-02	2,87E-01	1,72E-02	-4,65E+01
Non-hazardous waste	kg	7,36E+03	5,05E+00	5,44E+01	7,42E+03	5,03E+00	5,94E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,34E+04	0,00E+00	0,00E+00	1,50E+00	7,82E+00	3,24E+01	3,34E+02
Radioactive waste	kg	6,36E-02	5,27E-05	6,20E-04	6,43E-02	5,26E-05	1,37E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,21E+00	0,00E+00	0,00E+00	1,57E-05	6,83E-05	1,58E-06	-4,63E-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	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	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
Materials for recycling	kg	0,00E+00	0,00E+00	2,46E+01	2,46E+01	0,00E+00	1,69E+01	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	6,68E+01	0,00E+00	0,00E+00
Materials for energy rec	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	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
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,18E+01	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	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	2,35E+01	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	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	0,00E+00	1,82E+01	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	0,00E+00	0,00E+00	0,00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	1,08E+03	1,16E+01	6,16E+01	1,15E+03	1,16E+01	2,70E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,34E+03	0,00E+00	0,00E+00	3,45E+00	3,13E+00	4,60E-01	-1,58E+02
Ozone depletion Pot.	kg CFC_{-11}e	3,31E-05	1,85E-07	1,78E-06	3,50E-05	1,85E-07	1,42E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,13E-04	0,00E+00	0,00E+00	5,50E-08	2,44E-08	5,55E-09	-1,24E-06
Acidification	kg SO_2e	1,16E+01	1,96E-02	1,61E-01	1,18E+01	1,95E-02	4,58E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,67E+01	0,00E+00	0,00E+00	5,80E-03	2,17E-02	1,38E-03	-8,83E-01
Eutrophication	kg PO_4^3e	2,86E+00	4,96E-03	3,49E-01	3,22E+00	4,92E-03	2,85E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,75E+00	0,00E+00	0,00E+00	1,47E-03	3,06E-03	7,77E-04	-1,12E-01
POCP (“smog”)	kg C_2H_4e	4,88E-01	2,07E-03	1,39E-02	5,04E-01	2,06E-03	7,12E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,00E+00	0,00E+00	0,00E+00	6,14E-04	1,26E-03	1,53E-04	-9,35E-02
ADP-elements	kg Sbe	2,51E-01	3,80E-05	5,08E-04	2,51E-01	3,80E-05	4,89E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,87E-02	0,00E+00	0,00E+00	1,13E-05	1,20E-04	5,61E-07	-8,60E-03
ADP-fossil	MJ	1,17E+04	1,61E+02	9,05E+02	1,28E+04	1,61E+02	1,44E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,75E+04	0,00E+00	0,00E+00	4,78E+01	3,45E+01	5,92E+00	-1,56E+03

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Electricity production, wind, 1-3MW, High voltage
Electricity CO2e / kWh	1,1
District heating data source and quality	
District heating CO2e / kWh	

Transport scenario documentation A4

Scenario parameter	Value
Fuel and vehicle type. Eg, electric truck, diesel powered truck	Freight, lorry 16-32 metric ton, EURO6
Average transport distance, km	382
Capacity utilization (including empty return) %	50
Bulk density of transported products	133kg
Volume capacity utilization factor	1

Installation scenario documentation A5

Scenario information	Value
Ancillary materials for installation (specified by material) / kg or other units as appropriate	0
Water use / m^3	0
Other resource use / kg	0
Quantitative description of energy type (regional mix) and consumption during the installation process / kWh or MJ	0
Waste materials on the building site before waste processing, generated by the product's installation (specified by type) / kg	13,85
Output materials (specified by type) as result of waste processing at the building site e.g. collection for recycling, for energy recovery, disposal (specified by route) / kg	13,85
Direct emissions to ambient air, soil and water / kg	0

Use stages scenario documentation - B6-B7 Use of energy and use of water

Scenario information	Value
Ancillary materials specified by material / kg or units as appropriate	0
Net fresh water consumption / m^3	0
Type of energy carrier, e.g., electricity, natural gas, district heating / kWh	
Power output of equipment / kW	
Characteristic performance, e.g., energy efficiency, emissions, variation of performance with capacity utilization, etc.	
Further assumptions for scenario development, e.g., frequency and period of use, number of occupants	

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 is filed at EPD Hub. EPD Hub PCR and ECO Platform verification checklist are used.

EPD Hub cannot 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

Elma Avdyli, as authorized verifier acting for EPD HUB Limited

21.01.2026

ANNEX

GROUPED PRODUCTS OVERVIEW TABLE

Below shows the variance in GWP Fossil of the products this EPD covers, they are calculated based on the DU. High impact parts such as fans, heating elements (coils) and Electronics (PCB) are not calculated but are specific.

Variabilty comparison table
(Global Warming Potential fossil, Kg CO2eq.)

		S 100-H3	S 150-H3	S 200-H3	S 250-H3	M 100-H3	M 150-H3	M 200-H3*	M 250-H3	L 100-H3	L 150-H3	L 200-H3	L 250-H3	XL 100-H3	XL 150-H3	XL 200-H3	XL 250-H3
Raw material extraction and processing	**A1**	66%	78%	87%	101%	71%	85%	1,08E+03	111%	82%	104%	121%	144%	85%	107%	128%	150%
Transport to the manufacturer	**A2**	45%	63%	82%	103%	52%	73%	1,17E+01	119%	72%	104%	137%	170%	76%	110%	145%	179%
Manufacturing	**A3**	85%	89%	100%	104%	85%	89%	6,13E+01	104%	85%	89%	100%	105%	85%	89%	100%	105%
Product stage	**A1-A3**	67%	79%	88%	102%	72%	85%	1,15E+03	111%	82%	103%	121%	142%	85%	107%	127%	149%
Transport to the building site	**A4**	45%	63%	85%	107%	49%	69%	1,17E+01	116%	58%	85%	117%	146%	61%	91%	124%	153%
Installation into the building	**A5**	39%	52%	100%	116%	39%	52%	1,21E+00	116%	39%	52%	100%	116%	39%	52%	100%	116%
Operational energy use	**B6**	37%	56%	72%	91%	50%	74%	7,33E+03	124%	106%	160%	213%	267%	191%	285%	379%	476%
Waste transport	**C2**	47%	67%	82%	107%	52%	75%	3,47E+00	116%	62%	95%	119%	153%	66%	101%	128%	161%
Waste processing	**C3**	44%	61%	75%	96%	54%	76%	3,14E+00	119%	75%	111%	142%	179%	80%	119%	154%	192%
Waste disposal	**C4**	67%	81%	88%	100%	75%	87%	4,71E-01	110%	85%	104%	120%	139%	87%	107%	124%	144%
External impacts (excluded from totals)	**D**	44%	64%	81%	103%	52%	75%	-1,57E+02	119%	69%	105%	136%	173%	74%	111%	146%	182%
	Total	41%	59%	74%	92%	53%	76%	**8,51E+03**	122%	102%	152%	200%	249%	176%	261%	344%	430%

* Declared unit = 100%

COUNTRY SPECIFIC RESULTS

Below are the results for Module B6 operational energy use of the DU over its reference lifetime (see page 6; *Product use and maintenance* for scenario) in various sales representative countries across Europe. The datapoints used correspond to the country's low-voltage electricity market . The DU has been calculated using the Market group for European electricity, low voltage. It is added for indicative comparison only.

	GWP total kg CO2e	GWP fossil kg CO2e	GWP biogenic kg CO2e	GWP LULUC kg CO2e	ODP kg CFC11e	AP mol H+ eq.	EP Fresh water kg Pe	EP aquatic marine kg N eq.	Eutro-phication terrestrial mol N eq.	POCP kg NMVOC eq.	ADP non-fossil kg Sbe	ADP fossil MJ	Water use m3 deprived
Europe	7,36E+03	7,33E+03	0,00E+00	2,25E+01	1,35E-04	4,31E+01	6,83E+00	6,76E+00	6,06E+01	2,00E+01	9,90E-02	1,71E+05	4,65E+03
Germany	8,75E+03	8,73E+03	0,00E+00	1,80E+01	1,12E-04	2,52E+01	1,19E+01	6,48E+00	4,79E+01	1,54E+01	1,11E-01	1,37E+05	2,27E+03
France	1,96E+03	1,96E+03	0,00E+00	1,96E+00	6,92E-05	1,37E+01	8,17E-01	2,60E+00	2,16E+01	7,39E+00	9,40E-02	2,54E+05	3,22E+03
Netherlands	7,02E+03	7,00E+03	0,00E+00	2,36E+01	1,33E-04	3,99E+01	6,95E+00	6,21E+00	5,44E+01	1,80E+01	9,90E-02	1,63E+05	4,77E+03
United-Kingdom	5,83E+03	5,83E+03	-4,44E-16	7,25E+00	2,95E-04	2,16E+01	1,05E+00	4,68E+00	5,42E+01	1,51E+01	9,85E-02	1,58E+05	1,56E+03

Acronyms list: ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP = Eutrophication aquatic; POCP = Formation potential of tropospheric ozone; ADP = Abiotic depletion potential (Elements) for non-fossil resources (+A2); ADP = Abiotic depletion potential (Fossil fuels) for fossil resources (+A2)

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.

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	1,08E+03	1,17E+01	6,18E+01	1,16E+03	1,17E+01	1,21E+00	ND	ND	ND	ND	ND	7,36E+03	ND	0,00E+00	3,47E+00	3,15E+00	4,71E-01	-1,59E+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.