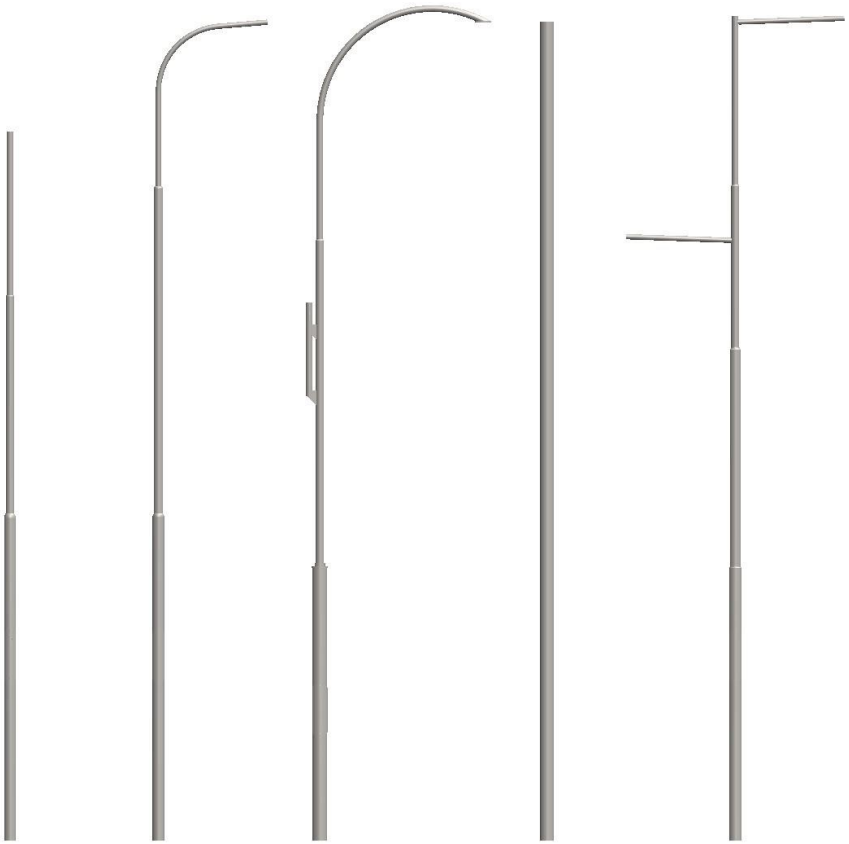


ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Pole - Hot dip Galvanized
AB Varmförzinkning

EPD HUB, HUB-6902
Published on 04.07.2026, last updated on 04.07.2026, valid until 03.07.2031

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.

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	AB Varmförzinkning
Address	Fållinge Industriområde 1, 333 91, Smålandsstenar, SE
Contact details	info@varmforzinkning.se
Website	www.varmforzinkning.se

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 options, A4, and modules C1-C4, D
EPD author	Therese Nygren
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Magaly Gonzalez Vazquez 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	Pole - Hot dip Galvanized
Additional labels	Stepped pole, stepped pole with one or several arms, tension pole
Product reference	-
Place(s) of raw material origin	EU
Place of production	Smålandsstenar, Sweden
Place(s) of installation and use	Sweden, EU
Period for data	01/01/2025 - 31/12/2025
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3 (%)	- 5,9 % / 13,3 %
GTIN (Global Trade Item Number)	-
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	89,5

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg
Declared unit mass	1 kg
Mass of packaging	0,03563 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	3,03
GWP-total, A1-A3 ($kgCO_2e$)	2,86
Secondary material, inputs (%)	4,34
Total energy use, A1-A3 (kWh)	16
Net freshwater use, A1-A3 (m^3)	0,03

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

AB Varmförzinkning is since the 1960s located in Smålandsstenar, Sweden. We are a family-owned company that now has the third generation engaged in the company to build towards the future. With hot dip galvanized steel products such as lightning poles, mast and railing we´re looking for solutions and prefer a close collaboration with our clients. AB Varmförzinkning develop, produce and sell our products with trust, vicinity and simplicity. In our factory we have the whole chain, from the first raw material to the finished galvanized product.
This gives us the opportunity for a delivery to be correctly executed and to be more environmentally friendly.
AB Varmförzinkning is driven towards new goals and to continuously improve ourselves in order to fulfill our clients´ expectations and requirements.

PRODUCT DESCRIPTION

A hot dip galvanized hollow steel pipe that comes in different shapes. The different shapes can for example be a stepped pole, a stepped pole with one or several straight arms or arms that are bent in different angels and just one straight pole (tension pole). This different variation of poles is illustrated on the frontpage. We produce these poles and adapt them for different type of traffic environment to be a base for light fixtures, for example in parks, streets and market places.
The length of the hollow steel pipes poles can vary from 0,5 - 16 meters, and the arms can be up to 4,5 meters.
The technical service life is minimum 30 years and the poles are CE-certified according to EN 40 - 5:2002 - Specification for steel lightning columns.
The galvanized steel gives the pole a corrosion protection and follow the standard of SS-EN ISO 1461 Hot dip galvanized coatings on fabricated iron and steel articles.

Further information can be found at:
www.varmforzinkning.se

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	100	EU
Minerals	-	-
Fossil materials	-	-
Bio-based materials	-	-

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	0,0173

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 kg
Mass per declared unit	1 kg
Functional unit	-
Reference service life	30 years

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	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.
The raw material is transported from our different suppliers on lorry and the transport distance can vary between 2 - 756 km. The lorry´s capacity assumes to be a full load; in reality it may differ although in the end with negligible result. The return trip for the lorry is not taken into account due to that assumption is that the transporttation company use this trip to accomodate other clients´ need for transportation. The details that are produced to become the finished product go through different stages; they are cut, shaped and welded together before being hot dipped galvanized (HDG). The production losses from the raw material are being sent to recycling and in some case destruction and or landfill. The transportation method is by lorry and the distance vary between 15 - 444 km, depending on the material and the waste process, for example according to the world steel association, 15 % goes to landfill and 85 % goes to recycling. In the producing process the use of hydraulic oils, cutting emulsions and otherlubrication oils are to reduce the wear and to protect the machines. The manufacturing process requires electricity (in our case 100 % renewable) for powering the machinery and also fuels for heating the facility. The finished product is being packed and prepared for distribution, which includes wooden litter and PET-plastic strap. The plastic strap consist of 99 - 100 % recycled material.

TRANSPORT AND INSTALLATION (A4-A5)

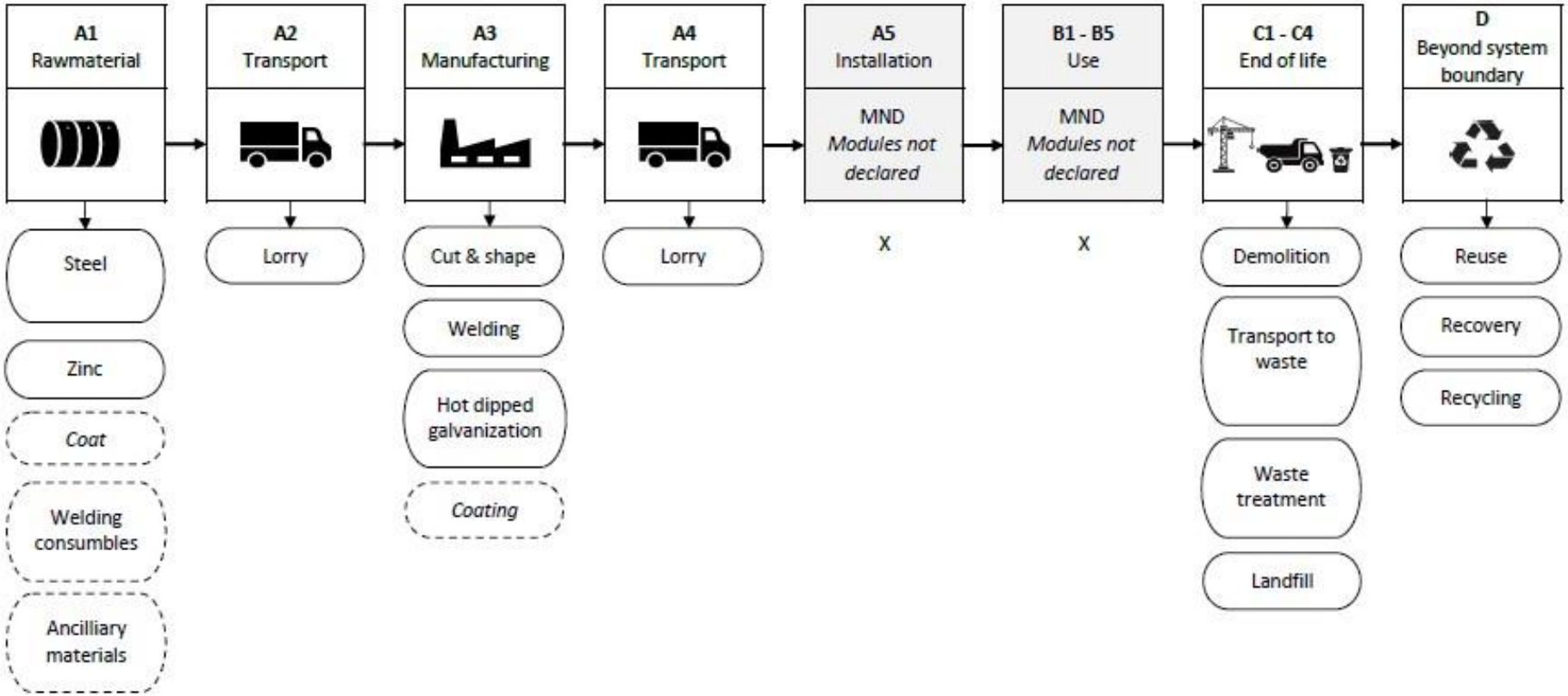
Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

The transportation distance is defined according to the PCR-rules. Our calculated average transportation distance from the manufacturing site to building site is estimated to 319 km and the assumed transportation method is lorry.
The lorry´s capacity assumes to be a full load; in reality it may differ although in the end with a negligible result.
The return trip for the lorry is not taken into account due to that assumption is that the transportation company use this trip to accommodate other clients´ need for transportation.
This EPD does not cover A5 the installation.

PRODUCT END OF LIFE (C1-C4, D)

The current scenario for end-of-life is as follows. Demolition and dismantling of the product are assumed to consume 0,01 kWh / kg. The source of energy is diesel fuel used by construction machines (C1)(Ecoinvent 3.10.1 year 2024). We assume that all waste is being collected and transported to a waste treatment center and assume that the transportation distance is 50 km. The assumed method of transportation is lorry. Due to the fact that our product is sold in all of Sweden, it is a generic transport distance beeing used and transportmetohed. According to the World steel association that assumes that 85 % of the waste from the steel product is transported for recycling (C3) and 15 % is used for landfill as a final disposal (C4). When looking at the recycling process, the end-of-life product is converted into recycled steel (D). The packaging (wood litter) is divided into several end-of-life scenarios according to Eurostat & BuildLCA 2020, 50 % goes to energy recovery, 26 % goes to recycling and 24 % goes to landfill. The PET plastic strap is according to Plastic Europe 2020 24 % goes to recycling, 49 % goes to incineration and 27 % to landfill. For both of these packaging material the transportation method is assumed to be Lorry and the distance vary between 50 – 250 km depending in the waste process.
Due to the material recovery potential of the product and material and energy recovery potential of its packaging, recycled raw materials lead to avoided virgin material production and the energy recovered from incineration replaces electricity and heat from primary sources. Benefits and loads from incineration and recycling are included in Module D.

LIFE CYCLE FLOW 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.

This LCA study includes the provision of all materials, transportation, energy and emission flows, and end of life processing of product. All industrial processes from raw material acquisition and pre-processing, production, product distribution and end-of-life management are included. Due to lack of data, some ancillary materials are excluded but they do not exceed the 1% cut-off criteria. These include materials which are used in the product manufacturing only in very small amounts and have a negligible impact on the emissions of the product. 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. 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	Physical Properties
Packaging material	Physical Properties
Ancillary materials	Physical Properties
Manufacturing energy and waste	Physical Properties

All estimations and assumptions regarding the cut off criteria and the allocation are declared in the part "Cut-off Criteria except the estimations/assumptions below:
Proxy data is used for certain materials due to their unavailability in the database.
- Module A1: Steel elements are assumed to be made of 20% recycled material.
- Module A2, A4 & C2: Vehicle capacity utilization volume factor is assumed to be 1 which means full load. It may vary but as the role of transportation emission in total results is small, the variety in load is assumed to be negligible. To be conservative, empty returns are included in this study as

implemented through an average load factor in the Ecoinvent transport datapoints.
- Module A4: Transportation does not cause losses as products are packaged properly. Also, volume capacity utilization factor is assumed to be 1 for the nested packaged products. Additionally, transportation distances are assumed based on a particular scenario of customer's premises in 181 and a lorry is the assumed vehicle type used.
- Module C2: Transportation distance to waste handling facility is estimated as 50 km and the transportation method is assumed as lorry.
- Module C3, C4, D: The product undergoes separate collection and a certain percentage of each material is assumed to be recycled, incinerated and landfilled. Ash from incineration processes is assumed negligible. The recycled end-of-life materials are assumed to serve as secondary raw materials in manufacturing while the materials incinerated displace electricity and heat production.

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	Multiple products
Grouping method	Based on worst-case results
Variation in GWP-fossil for A1-A3, %	- 5,9 % / 13,3 %

The averaging of products is calculated based on a representative sum of products. The declared unit 1 kg of hot-dip galvanized pole is representative for a product consisting of an average weight of steel 0.93 kg and zinccoat with average weight 0,07 kg.
The averaging of products consist of poles, from 48mm to 300 mm YDm, the height of the pole can vary from 0,6 m up to 16 meters. The lenght of the arm can be 4,5 meters long and max 152,4 mm YD. The pole itself can consist of one hollow pipe YD or several pipes with different YD.
When calculating min and max GWP fossile, the selection is based upon which supplier has delivered the material.
If it comes directly from steel fabric = min, and if it has been purchased thorugh a dealer = max. When the average is based on a mix of the two.
When looking at GWP fossile and the difference in procentage between +A1 and +A2 in the different scenarios, we see that in Average has a 8,75 % difference, Min has 6,32 % difference and Max 8,03 % has difference.
If we look att the GWP total A1 - A3; Average = 2,86 kg CO2e, Min 2,69 kg CO2e = -5,9 % to the average result and Max 3,24 kg Co2e = +13,3 % on the average result.

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'.

- Transport of raw materials to the manufacturing site is based on actual suppliers' distances, no generic assumptions are applied.

Data sources:
Raw material
- Hot rolled steel, SSAB (+A1, specific datapoint)
- Steel tubes, Heléns (+A1, specific datapoint)
- Cold-formed hollow sections, TIBNOR (+A1, specific datapoint)
- Primary zinc, Ecoinvent 3.10.1 (Generic)
- Steel production, Ecoinvent 3.11 (Generic +A2)
Material losses from steel cutting and forming are included in A3, the metal scrap is collected and sent for recycling.
Waste from zinc (two forms, zinc slag and bottom ash, generic Ecoinvent 3.11) is collected and sent for recycling.

Energy sources:
Electricity is modelled based on contracted fossile free agreement, the sources can cary from year to year as long as it is fossile free. This period of data is based on:
- Electricity production, photovoltaic, low voltage, Sweden, Ecoinvent 3.11
- Market for electricity (produkction from biomaterial), medium voltage, Sweden, Ecoinvent 3.11
- Electricity production, hydro, non-alpine region. high voltage, Sweden, Ecoinvent 3.11
- Electricity production, wind, onshore, Sweden, Ecoinvent 3.11
Voltage transformation from high to medium voltage, Sweden, Ecoinvent 3.11

Heating the facility:
- RME 100 fossile free fuel, Esterification of rape oil, Sweden, Ecoinvent 3.11

Packaging and ancillary:
Packaging material are softwood (Ecoinvent 3.11) in different shapes and PET-plastic strap (packaging film production Ecoinvent 3.10.1).
Ancillary material, Hydrochloric acid (Ecoinvent 3.10.1), is for the process before the hot dip galvanization.
Assumptions for A3 manufacturing waste, treatment scenario reference:
Waste processing modelled using a European end-of-life scenario.
- Steel, based on World steel association (2020)
- Softwood, based on Eurostat & BuildLCA 2020.
- PET-plastic strap, based on Eurostat & BuildLCA 2020.

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	2,67E+00	5,09E-02	1,35E-01	2,86E+00	3,57E-02	ND	ND	ND	ND	ND	ND	ND	ND	3,62E-03	2,20E-03	1,67E-02	1,05E-03	-1,28E+00
GWP – fossil	kg CO_2e	2,67E+00	5,09E-02	3,15E-01	3,03E+00	3,56E-02	ND	ND	ND	ND	ND	ND	ND	ND	3,62E-03	2,20E-03	1,67E-02	1,05E-03	-1,26E+00
GWP – biogenic	kg CO_2e	3,32E-03	1,15E-05	-1,99E-01	-1,96E-01	8,07E-06	ND	ND	ND	ND	ND	ND	ND	ND	6,90E-07	3,68E-07	-3,86E-06	-3,09E-07	-1,50E-02
GWP – LULUC	kg CO_2e	1,48E-03	2,28E-05	1,92E-02	2,07E-02	1,59E-05	ND	ND	ND	ND	ND	ND	ND	ND	3,71E-07	9,84E-07	7,02E-06	5,94E-07	-4,91E-04
Ozone depletion pot.	kg $CFC\text{-}_{11}$e	1,05E-08	7,51E-10	1,06E-08	2,18E-08	5,26E-10	ND	ND	ND	ND	ND	ND	ND	ND	5,38E-11	3,25E-11	3,60E-10	2,95E-11	-5,11E-09
Acidification potential	mol H^+e	8,13E-03	1,73E-04	4,27E-03	1,26E-02	1,22E-04	ND	ND	ND	ND	ND	ND	ND	ND	3,24E-05	7,50E-06	8,63E-05	7,28E-06	-5,54E-03
EP-freshwater[2)]	kg Pe	2,77E-04	3,96E-06	1,04E-04	3,85E-04	2,78E-06	ND	ND	ND	ND	ND	ND	ND	ND	1,17E-07	1,71E-07	1,36E-06	1,46E-07	-6,13E-04
EP-marine	kg Ne	2,10E-03	5,70E-05	3,26E-03	5,42E-03	3,99E-05	ND	ND	ND	ND	ND	ND	ND	ND	1,51E-05	2,47E-06	3,38E-05	5,51E-06	-1,25E-03
EP-terrestrial	mol Ne	2,24E-02	6,20E-04	1,67E-02	3,97E-02	4,35E-04	ND	ND	ND	ND	ND	ND	ND	ND	1,65E-04	2,68E-05	3,66E-04	3,03E-05	-1,36E-02
POCP ("smog")[3)]	kg NMVOCe	6,20E-03	2,56E-04	1,15E-03	7,60E-03	1,79E-04	ND	ND	ND	ND	ND	ND	ND	ND	4,94E-05	1,11E-05	1,30E-04	1,10E-05	-4,47E-03
ADP-minerals & metals[4)]	kg Sbe	1,39E-04	1,42E-07	2,96E-06	1,42E-04	9,94E-08	ND	ND	ND	ND	ND	ND	ND	ND	1,30E-09	6,14E-09	4,13E-08	1,69E-09	-6,70E-05
ADP-fossil resources	MJ	3,30E+01	7,38E-01	1,05E+01	4,42E+01	5,17E-01	ND	ND	ND	ND	ND	ND	ND	ND	4,72E-02	3,19E-02	2,78E-01	2,50E-02	-1,20E+01
Water use[5)]	m^3e depr.	4,03E+00	3,65E-03	8,20E-01	4,86E+00	2,56E-03	ND	ND	ND	ND	ND	ND	ND	ND	1,21E-04	1,58E-04	1,76E-03	7,60E-05	-3,22E-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	1,50E-08	5,09E-09	3,51E-08	5,52E-08	3,57E-09	ND	ND	ND	ND	ND	ND	ND	ND	9,25E-10	2,20E-10	1,87E-09	1,66E-10	-8,14E-08
Ionizing radiation[6]	kBq U235e	5,98E-02	6,43E-04	5,91E-01	6,52E-01	4,51E-04	ND	ND	ND	ND	ND	ND	ND	ND	2,01E-05	2,78E-05	3,14E-04	1,64E-05	2,29E-02
Ecotoxicity (freshwater)	CTUe	3,69E+01	1,04E-01	1,26E+01	4,95E+01	7,32E-02	ND	ND	ND	ND	ND	ND	ND	ND	2,69E-02	4,52E-03	3,33E-02	2,94E-03	-1,83E+01
Human toxicity, cancer	CTUh	1,12E-09	8,40E-12	2,86E-10	1,42E-09	5,88E-12	ND	ND	ND	ND	ND	ND	ND	ND	3,69E-13	3,63E-13	4,21E-12	2,01E-13	-5,67E-10
Human tox. non-cancer	CTUh	2,82E-08	4,78E-10	1,60E-08	4,47E-08	3,35E-10	ND	ND	ND	ND	ND	ND	ND	ND	5,80E-12	2,07E-11	1,60E-10	6,29E-12	-2,09E-08
SQP[7]	-	1,83E+00	7,43E-01	2,25E+01	2,51E+01	5,21E-01	ND	ND	ND	ND	ND	ND	ND	ND	3,12E-03	3,22E-02	3,65E-01	5,00E-02	-4,13E+00

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	1,60E+00	1,01E-02	1,22E+01	1,38E+01	7,09E-03	ND	ND	ND	ND	ND	ND	ND	ND	2,96E-04	4,38E-04	-3,01E-01	-1,35E-01	-9,13E-01
Renew. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,12E-01
Total use of renew. PER	MJ	1,60E+00	1,01E-02	1,22E+01	1,38E+01	7,09E-03	ND	ND	ND	ND	ND	ND	ND	ND	2,96E-04	4,38E-04	-3,01E-01	-1,35E-01	-8,01E-01
Non-re. PER as energy	MJ	3,33E+01	7,38E-01	9,73E+00	4,38E+01	5,17E-01	ND	ND	ND	ND	ND	ND	ND	ND	4,72E-02	3,19E-02	2,60E-01	1,83E-02	-1,20E+01
Non-re. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	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	3,33E+01	7,38E-01	9,73E+00	4,38E+01	5,17E-01	ND	ND	ND	ND	ND	ND	ND	ND	4,72E-02	3,19E-02	2,60E-01	1,83E-02	-1,20E+01
Secondary materials	kg	4,34E-02	3,14E-04	3,97E-03	4,77E-02	2,20E-04	ND	ND	ND	ND	ND	ND	ND	ND	1,95E-05	1,36E-05	1,07E-04	6,51E-06	6,91E-01
Renew. secondary fuels	MJ	8,25E-06	3,99E-06	5,16E-05	6,39E-05	2,80E-06	ND	ND	ND	ND	ND	ND	ND	ND	5,12E-08	1,73E-07	1,52E-06	1,33E-07	-9,67E-05
Non-ren. secondary fuels	MJ	1,35E-22	0,00E+00	0,00E+00	1,35E-22	0,00E+00	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	1,34E-02	1,09E-04	1,91E-02	3,26E-02	7,65E-05	ND	ND	ND	ND	ND	ND	ND	ND	3,02E-06	4,72E-06	1,61E-04	-6,33E-06	-5,51E-03

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	3,04E-02	1,25E-03	5,02E-02	8,18E-02	8,76E-04	ND	ND	ND	ND	ND	ND	ND	ND	5,29E-05	5,41E-05	4,85E-04	2,89E-05	-3,88E-01
Non-hazardous waste	kg	8,58E-01	2,31E-02	4,51E-01	1,33E+00	1,62E-02	ND	ND	ND	ND	ND	ND	ND	ND	7,71E-04	1,00E-03	3,91E-02	4,12E-02	-3,35E+00
Radioactive waste	kg	5,49E-04	1,57E-07	1,27E-04	6,76E-04	1,10E-07	ND	ND	ND	ND	ND	ND	ND	ND	4,93E-09	6,81E-09	7,79E-08	4,01E-09	6,01E-06

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	1,34E-05	0,00E+00	0,00E+00	1,34E-05	0,00E+00	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	1,59E-02	0,00E+00	1,95E-01	2,11E-01	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	8,59E-01	0,00E+00	0,00E+00
Materials for energy rec	kg	9,26E-05	0,00E+00	0,00E+00	9,26E-05	0,00E+00	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	8,80E-02	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	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	3,70E-02	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	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	5,10E-02	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	2,23E+00	5,06E-02	3,34E-01	2,62E+00	3,55E-02	ND	ND	ND	ND	ND	ND	ND	ND	3,60E-03	2,19E-03	1,66E-02	1,50E-03	-1,25E+00
Ozone depletion Pot.	kg $CFC_{-11}e$	2,17E-08	5,99E-10	1,00E-08	3,23E-08	4,20E-10	ND	ND	ND	ND	ND	ND	ND	ND	4,28E-11	2,59E-11	2,87E-10	2,34E-11	-5,33E-09
Acidification	kg SO_2e	8,48E-03	1,32E-04	2,62E-03	1,12E-02	9,28E-05	ND	ND	ND	ND	ND	ND	ND	ND	2,28E-05	5,73E-06	6,35E-05	5,39E-06	-4,45E-03
Eutrophication	kg PO_4^3e	1,36E-03	3,23E-05	8,65E-03	1,00E-02	2,26E-05	ND	ND	ND	ND	ND	ND	ND	ND	5,36E-06	1,40E-06	1,82E-05	1,94E-06	-8,16E-04
POCP (“smog”)	kg C_2H_4e	5,85E-04	1,18E-05	9,32E-05	6,90E-04	8,27E-06	ND	ND	ND	ND	ND	ND	ND	ND	1,71E-06	5,11E-07	5,70E-06	6,06E-07	-6,28E-04
ADP-elements	kg Sbe	1,37E-04	1,38E-07	2,68E-06	1,40E-04	9,70E-08	ND	ND	ND	ND	ND	ND	ND	ND	1,26E-09	5,99E-09	4,03E-08	1,66E-09	-6,70E-05
ADP-fossil	MJ	2,20E+01	7,28E-01	2,64E+00	2,54E+01	5,10E-01	ND	ND	ND	ND	ND	ND	ND	ND	4,69E-02	3,15E-02	2,73E-01	2,47E-02	-1,25E+01

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	2,67E+00	5,09E-02	3,35E-01	3,05E+00	3,57E-02	ND	ND	ND	ND	ND	ND	ND	ND	3,62E-03	2,20E-03	1,67E-02	1,05E-03	-1,26E+00

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 i

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

Magaly Gonzalez Vazquez as an authorized verifier for EPD Hub Limited
04.07.2026

VERIFIED ISO 14025