# ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

**EPD HUB, HUB-7131**
Published on 07.08.2026, last updated on 13.10.2026, valid until 06.08.2031

## Echo S

Elektro Elco Aktiebolag

This EPD is intended for business-to-business and/or business-to-consumer communication. 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. 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.

## MANUFACTURER AND SITE

| | |
|---|---|
| Manufacturer | Elektro Elco Aktiebolag |
| Address | TALLVÄGEN 5, 56435, Bankeryd, SE |
| Contact details | info@elco.se |
| Website | www.hidealite.se |
| Place of production | China,Guangdong |
| Place(s) of raw material origin | China |
| Place(s) of installation and use | Sweden, Denmark, Norway, Finland |
| Period for data | 2025 |

## 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 | Electrical product |
| Category of EPD | Third party verified EPD |
| Parent EPD number | |
| Scope of the EPD | Cradle to gate with options, A4-A5, B6, and modules C1-C4, D |
| EPD author | Emma Cunow - Elektro Elco AB |
| EPD verification | Independent verification of this EPD and data, according to ISO 14025:<br>☐ Internal verification ☑ External verification |
| EPD verifier | Haiha Nguyen as an authorized verifier for EPD Hub |

## PRODUCT SPECIFICATION

| | |
|---|---|
| Product name | Echo S |
| Product number / reference | 7474807 |
| GTIN (Global Trade Item Number) | - |
| NOBB (Norwegian Building Product Database) | - |
| A1-A3 Specific data (%) | 13,7 |

## PRODUCT CLASSIFICATION

| | |
|---|---|
| Declared operating voltage, Volt | 230 |
| Light source color temperature, Kelvin | 3000, 4000, 5700 |
| Protection index for water and dust (IP) | IP44 |
| Impact resistance index (IK) | - |
| Luminous flux, Lumen | 1150 |
| Electrical power, Watt | 14 |
| Luminous efficiency, Lm/W | 82 |

## PRODUCT DESCRIPTION

Echo S is one of three product variants within the Echo product family (Echo S, Echo M and Echo L). The environmental results presented in this EPD are specific to the Echo S variant and are not representative of the Echo L or Echo M variants.
Echo S is intended for indoor general lighting applications in public and commercial environments, including corridors, retail spaces and areas with high ceilings. It is suitable for both new installations and the replacement of compact fluorescent luminaires.Echo S have adjustable lumen output via DIP-switch,and Selectable colour temperature via DIP switch. also tool-free installation
The declared product consists of the luminaire housing, integrated LED light source, reflector and optical components, and the driver supplied as part of the standard Echo S configuration. The assessed configuration includes the standard driver phase-dimming as applicable to the declared product. Optional accessories and alternative configurations, including other size cover rings(150,170,215,270), Q-Box Mini, Linect and any other optional features not supplied as part of the declared product configuration, are not included within the scope of this EPD

## ABOUT THE MANUFACTURER

With the brand Hide-a-lite, we create efficient lighting solutions for both private and public environments. In our range, you will find high-quality luminaires that are easy to install, perfect for illuminating everything from industries and residences to hotels, restaurants, offices, and shops. Over the years, we have built extensive experience and knowledge in lighting, knowledge that we gladly share with our customers. Our focus lies on technology, design, and functionality, with a commitment to sustainable development and energy efficiency adapted for the Nordic market.

## ENVIRONMENTAL DATA SUMMARY

| | |
|---|---|
| Declared unit | 1 unit |
| Declared unit mass, kg | 0,6262 |
| Mass of packaging, kg | 0,193 |
| Functional unit | Provide lighting that delivers an outgoing artificial luminous flux of 1,000 lumens during a reference lifetime of 35,000 hours |
| Reference service life (years) | 20 |
| Assigned lifetime (hours) | 50000 |
| GWP-total, A1-A3 (kg $CO_2e$) | 9,3 |

| | |
|---|---|
| GWP-fossil, A1-A3 (kg $CO_2$e) | 9,51 |
| Secondary material, inputs (%) | 11,1 |
| Secondary material, outputs (%) | 52,5 |
| Total energy use, A1-A3 (kWh) | 32,4 |
| Net freshwater use, A1-A3 (m3) | 7,71E-02 |

# LIFE CYCLE ASSESSMENT

## 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 | ND | ND | ND | ND | ND | x | ND | x | x | x | x | x |
| Raw materials | Transport | Manufacturing | Transport | Assembly | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | Deconstr./demo. | Transport | Waste processing | Disposal | Reuse, Recovery, Recycling |

*Modules not declared = ND.*

## 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. There is no neglected unit process more than 1% of total mass or energy flows. The module-specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

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

## VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. Upstream process calculations rely on generic data as defined in the Bibliography section. 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

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 materials | No allocation |
| Ancillary materials | No allocation |
| Manufacturing energy and waste | Allocated by mass |

## PRODUCT & MANUFACTURING SITES GROUPING

| | |
|---|---|
| Type of grouping | No grouping |
| Grouping method | Not applicable |
| Variation in GWP-fossil for A1-A3, % | 0 |

This EPD is product and factory specific.

## PRODUCT RAW MATERIAL MAIN COMPOSITION

| Raw material category | Amount, mass- % | Material origin |
|---|---|---|
| Metals | 53,4 | APAC |
| Minerals | 0 | |
| Fossil materials | 8,86 | APAC |
| Bio-based materials | 0 | |
| Electronic parts | 37,74 | APAC |

## 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 | 0,07145 |

## SUBSTANCES, REACH - VERY HIGH CONCERN

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

## LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA Luminaire EPD Generator v2.2.7. The LCA and EPD have been prepared according to the reference standards, EN 50693, and ISO 14040/14044. Ecoinvent v3.10.1/3.11 and One Click LCA databases were used 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'.

# PRODUCT LIFE CYCLE

## MANUFACTURING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production. The material losses occurring during the manufacturing processes are treated as per the default values from table G.4 of EN 50693. The study also considers the fuels used by machines as well as losses during electricity transmission.
A market-based approach is used in modelling the electricity mix utilized in the factory.

The product is made of metals, plastics, and electronic components. All components are transported to the production facility, where the main manufacturing processes are associated with assembly of different parts and components. The finished product is packaged with polyethylene, cardboard, and/or paper as packaging material before being sent to customers.

## TRANSPORT AND INSTALLATION (A4-A5)

Transportation distances from manufacturing sites to customer locations are based on sales volume-based weighted averages. In the absence of exact data, conservative assumptions are made (A4).
Environmental impacts from installation include waste packaging materials (A5). During installation, there are no product losses, and the impacts of energy consumption and the used ancillary materials are considered negligible.

## PRODUCT USE AND MAINTENANCE (B1-B7)

During the use phase, the product consumes electricity (B6). As such, this EPD follows additional requirements for products using energy in module B6 of the use stage and permanently installed into building or infrastructure. A market-based approach is used in modelling the electricity mix utilized. Impacts due to electricity production include direct emissions to air, transformation, and transmission losses.

## PRODUCT END OF LIFE (C1-C4, D)

Consumption of energy and natural resources in demolition process is assumed to be negligible. It is assumed that the waste is collected separately and transported to the waste treatment centre. The transport distance is 150 km while the transportation method is assumed to be lorry (C2). 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. Due to the material and energy recovery potential of parts in the lighting system, the end-of-life product is converted into recycled raw materials, 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.

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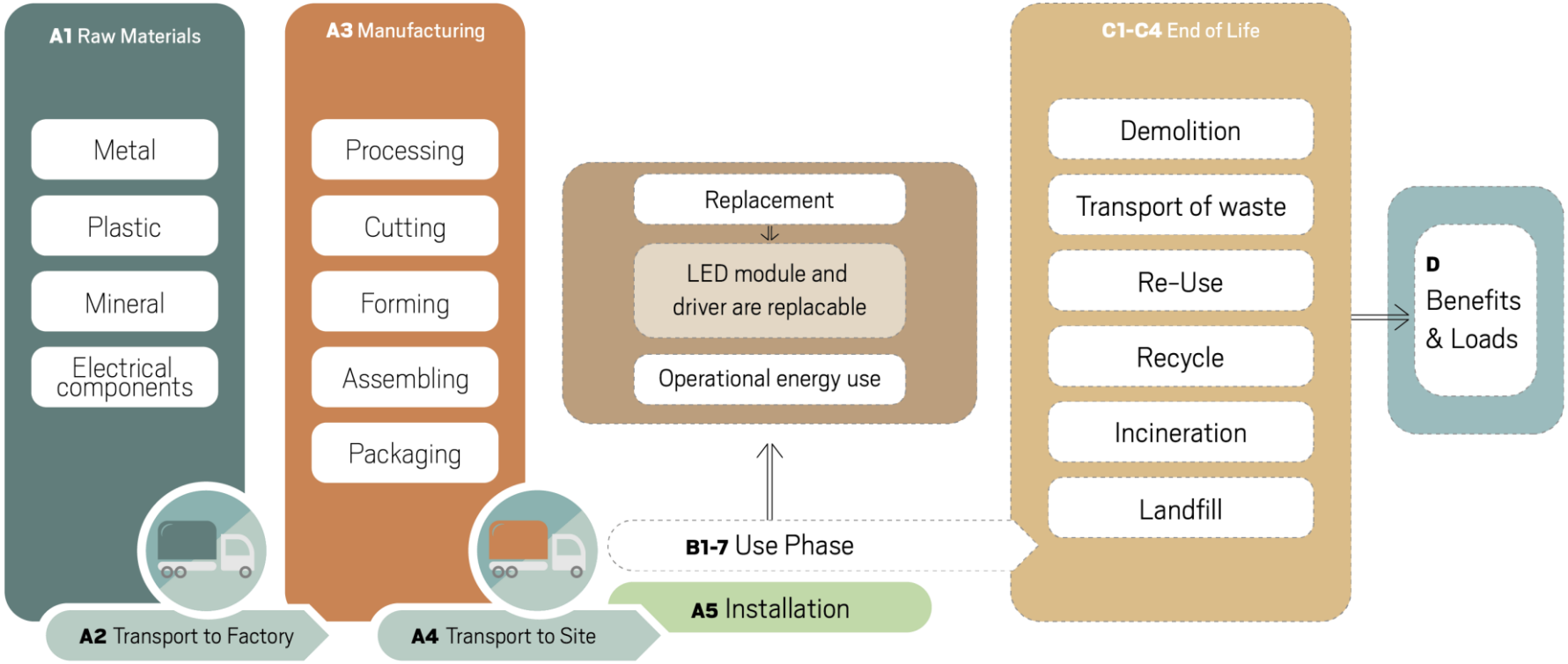
# LIFE CYCLE FLOW DIAGRAM



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# ENVIRONMENTAL IMPACT DATA, RESULTS PER DECLARED UNIT

*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 $CO_2$e | 8,01E+00 | 3,00E-03 | 1,28E+00 | 9,30E+00 | 2,02E-01 | 2,57E-01 | ND | ND | ND | ND | ND | 2,62E+01 | ND | 0,00E+00 | 1,83E-02 | 7,55E-02 | 5,57E-02 | -3,35E+00 |
| GWP – fossil | kg $CO_2$e | 7,97E+00 | 3,00E-03 | 1,54E+00 | 9,51E+00 | 2,02E-01 | 1,71E-02 | ND | ND | ND | ND | ND | 2,31E+01 | ND | 0,00E+00 | 1,83E-02 | 7,55E-02 | 5,57E-02 | -3,33E+00 |
| GWP – biogenic | kg $CO_2$e | 4,17E-02 | 6,71E-07 | -2,62E-01 | -2,20E-01 | 3,46E-05 | 2,40E-01 | ND | ND | ND | ND | ND | 4,20E-01 | ND | 0,00E+00 | 4,00E-06 | -5,43E-05 | -6,68E-06 | -1,96E-02 |
| GWP – LULUC | kg $CO_2$e | 5,23E-03 | 1,35E-06 | 5,84E-03 | 1,11E-02 | 1,05E-04 | 5,75E-06 | ND | ND | ND | ND | ND | 2,60E+00 | ND | 0,00E+00 | 8,10E-06 | 3,38E-05 | 5,72E-06 | -9,69E-04 |
| Ozone depletion pot. | kg $CFC_{-11}$e | 1,98E-07 | 4,44E-11 | 1,26E-08 | 2,11E-07 | 2,92E-09 | 1,15E-10 | ND | ND | ND | ND | ND | 6,93E-07 | ND | 0,00E+00 | 2,56E-10 | 1,97E-10 | 8,76E-11 | -1,46E-08 |
| Acidification potential | mol $H^+$e | 7,90E-02 | 7,84E-06 | 9,43E-03 | 8,84E-02 | 4,82E-03 | 4,22E-05 | ND | ND | ND | ND | ND | 2,83E-01 | ND | 0,00E+00 | 6,10E-05 | 1,74E-04 | 3,24E-05 | -7,92E-02 |
| EP-freshwater[2)] | kg Pe | 5,31E-03 | 2,34E-07 | 3,85E-04 | 5,70E-03 | 8,37E-06 | 1,60E-06 | ND | ND | ND | ND | ND | 2,05E-02 | ND | 0,00E+00 | 1,42E-06 | 1,05E-05 | 7,98E-07 | -4,28E-03 |
| EP-marine | kg Ne | 9,95E-03 | 2,11E-06 | 1,53E-03 | 1,15E-02 | 1,21E-03 | 4,08E-05 | ND | ND | ND | ND | ND | 4,18E-02 | ND | 0,00E+00 | 1,98E-05 | 4,04E-05 | 3,79E-05 | -5,57E-03 |
| EP-terrestrial | mol Ne | 1,05E-01 | 2,28E-05 | 1,30E-02 | 1,18E-01 | 1,34E-02 | 1,36E-04 | ND | ND | ND | ND | ND | 4,27E-01 | ND | 0,00E+00 | 2,15E-04 | 4,30E-04 | 1,41E-04 | -6,52E-02 |
| POCP ("smog")[3)] | kg NMVOCe | 3,32E-02 | 1,12E-05 | 3,82E-03 | 3,70E-02 | 3,71E-03 | 5,34E-05 | ND | ND | ND | ND | ND | 1,14E-01 | ND | 0,00E+00 | 8,49E-05 | 1,22E-04 | 4,33E-05 | -1,96E-02 |
| ADP-minerals & metals[4)] | kg Sbe | 3,80E-04 | 9,54E-09 | 9,62E-07 | 3,81E-04 | 2,76E-07 | 5,74E-08 | ND | ND | ND | ND | ND | 2,78E-03 | ND | 0,00E+00 | 6,01E-08 | 6,41E-07 | 1,23E-08 | -8,11E-04 |
| ADP-fossil resources | MJ | 9,42E+01 | 4,25E-02 | 1,79E+01 | 1,12E+02 | 2,57E+00 | 1,16E-01 | ND | ND | ND | ND | ND | 3,10E+03 | ND | 0,00E+00 | 2,57E-01 | 2,68E-01 | 7,43E-02 | -3,47E+01 |
| Water use[5)] | $m^3$e depr. | 2,22E+00 | 2,02E-04 | 1,19E+01 | 1,42E+01 | 8,53E-03 | 2,93E-03 | ND | ND | ND | ND | ND | 1,71E+02 | ND | 0,00E+00 | 1,19E-03 | 8,19E-03 | 2,80E-03 | -5,24E-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.*

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## 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 | 4,81E-07 | 2,46E-10 | 3,10E-08 | 5,12E-07 | 9,05E-09 | 6,83E-10 | ND | ND | ND | ND | ND | 2,36E-06 | ND | 0,00E+00 | 1,45E-09 | 2,00E-09 | 6,01E-10 | -2,36E-07 |
| Ionizing radiation[6)] | kBq U235e | 5,19E-01 | 3,54E-05 | 3,33E-02 | 5,53E-01 | 1,42E-03 | 4,41E-04 | ND | ND | ND | ND | ND | 2,22E+02 | ND | 0,00E+00 | 2,08E-04 | 1,93E-03 | 8,90E-05 | -2,15E-01 |
| Ecotoxicity (freshwater) | CTUe | 8,36E+01 | 6,53E-03 | 4,26E+00 | 8,78E+01 | 2,32E-01 | 7,96E-01 | ND | ND | ND | ND | ND | 3,88E+02 | ND | 0,00E+00 | 4,06E-02 | 2,09E-01 | 5,52E+00 | -4,96E+01 |
| Human toxicity, cancer | CTUh | 7,06E-09 | 4,99E-13 | 2,12E-10 | 7,27E-09 | 4,09E-11 | 5,93E-12 | ND | ND | ND | ND | ND | 4,57E-08 | ND | 0,00E+00 | 3,11E-12 | 1,59E-11 | 4,93E-11 | -7,75E-09 |
| Human tox. non-cancer | CTUh | 2,70E-07 | 2,70E-11 | 1,04E-08 | 2,80E-07 | 8,81E-10 | 3,06E-10 | ND | ND | ND | ND | ND | 2,39E-06 | ND | 0,00E+00 | 1,61E-10 | 9,87E-10 | 9,80E-10 | -7,27E-07 |
| SQP[7)] | - | 2,59E+01 | 3,08E-02 | 1,43E+01 | 4,02E+01 | 7,86E-01 | 7,98E-02 | ND | ND | ND | ND | ND | 7,29E+02 | ND | 0,00E+00 | 1,53E-01 | 2,50E-01 | 1,18E-01 | -2,62E+01 |

*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 the 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 | 5,90E+00 | 5,88E-04 | 3,92E-01 | 6,29E+00 | 2,35E-02 | -2,98E+00 | ND | ND | ND | ND | ND | 2,12E+03 | ND | 0,00E+00 | 3,52E-03 | 3,85E-02 | 1,55E-03 | -2,03E+00 |
| Renew. PER as material | MJ | 0,00E+00 | 0,00E+00 | 2,34E+00 | 2,34E+00 | 0,00E+00 | -2,34E+00 | ND | ND | ND | ND | ND | 0,00E+00 | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Total use of renew. PER | MJ | 5,90E+00 | 5,88E-04 | 2,74E+00 | 8,64E+00 | 2,35E-02 | -5,33E+00 | ND | ND | ND | ND | ND | 2,12E+03 | ND | 0,00E+00 | 3,52E-03 | 3,85E-02 | 1,55E-03 | -2,03E+00 |
| Non-re. PER as energy | MJ | 9,27E+01 | 4,25E-02 | 1,78E+01 | 1,10E+02 | 2,57E+00 | -1,55E-01 | ND | ND | ND | ND | ND | 3,10E+03 | ND | 0,00E+00 | 2,57E-01 | -5,67E-01 | -8,61E-01 | -3,46E+01 |
| Non-re. PER as material | MJ | 1,57E+00 | 0,00E+00 | 2,99E-01 | 1,87E+00 | 0,00E+00 | -3,26E-01 | ND | ND | ND | ND | ND | 0,00E+00 | ND | 0,00E+00 | 0,00E+00 | -6,76E-01 | -8,67E-01 | 0,00E+00 |
| Total use of non-re. PER | MJ | 9,42E+01 | 4,25E-02 | 1,81E+01 | 1,12E+02 | 2,57E+00 | -4,81E-01 | ND | ND | ND | ND | ND | 3,10E+03 | ND | 0,00E+00 | 2,57E-01 | -1,24E+00 | -1,73E+00 | -3,46E+01 |
| Secondary materials | kg | 6,96E-02 | 0,00E+00 | 0,00E+00 | 6,96E-02 | 0,00E+00 | 0,00E+00 | ND | ND | ND | ND | ND | 0,00E+00 | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Renew. secondary fuels | MJ | 2,60E-03 | 2,42E-07 | 1,98E-02 | 2,24E-02 | 5,42E-06 | 1,03E-06 | ND | ND | ND | ND | ND | 2,75E-03 | ND | 0,00E+00 | 1,47E-06 | 1,26E-05 | 1,12E-06 | -3,05E-04 |
| Non-ren. secondary fuels | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | ND | ND | ND | ND | ND | 0,00E+00 | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Use of net fresh water | $m^3$ | 5,44E-02 | 5,95E-06 | 2,27E-02 | 7,71E-02 | 2,25E-04 | -1,40E-05 | ND | ND | ND | ND | ND | 4,06E+00 | ND | 0,00E+00 | 3,40E-05 | 1,90E-04 | -7,94E-05 | -2,93E-02 |

*8) PER = Primary energy resources.*

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## 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 | 1,49E+00 | 7,38E-05 | 1,61E-02 | 1,51E+00 | 3,64E-03 | 9,81E-04 | ND | ND | ND | ND | ND | 3,16E+00 | ND | 0,00E+00 | 4,48E-04 | 2,85E-03 | 4,23E-02 | -8,28E-01 |
| Non-hazardous waste | kg | 2,59E+01 | 1,38E-03 | 6,13E-01 | 2,65E+01 | 5,45E-02 | 1,30E-01 | ND | ND | ND | ND | ND | 1,05E+02 | ND | 0,00E+00 | 8,39E-03 | 7,50E-02 | 4,08E-01 | -2,19E+01 |
| Radioactive waste | kg | 1,27E-04 | 8,68E-09 | 6,19E-06 | 1,33E-04 | 3,47E-07 | 1,12E-07 | ND | ND | ND | ND | ND | 4,74E-02 | ND | 0,00E+00 | 5,09E-08 | 4,72E-07 | 2,19E-08 | -5,28E-05 |

## 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 reuse | kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | ND | ND | ND | ND | ND | 0,00E+00 | ND | 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 | 2,93E-03 | 2,93E-03 | 0,00E+00 | 1,54E-01 | ND | ND | ND | ND | ND | 0,00E+00 | ND | 0,00E+00 | 0,00E+00 | 3,29E-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 | ND | ND | ND | ND | ND | 0,00E+00 | 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 | 3,43E-03 | 3,43E-03 | 0,00E+00 | 1,14E-01 | ND | ND | ND | ND | ND | 0,00E+00 | ND | 0,00E+00 | 0,00E+00 | 2,62E-01 | 0,00E+00 | 0,00E+00 |
| Exported energy: Electricity | MJ | 0,00E+00 | 0,00E+00 | 1,44E-03 | 1,44E-03 | 0,00E+00 | 4,82E-02 | ND | ND | ND | ND | ND | 0,00E+00 | ND | 0,00E+00 | 0,00E+00 | 1,10E-01 | 0,00E+00 | 0,00E+00 |
| Exported energy: Heat | MJ | 0,00E+00 | 0,00E+00 | 1,99E-03 | 1,99E-03 | 0,00E+00 | 6,18E-02 | ND | ND | ND | ND | ND | 0,00E+00 | ND | 0,00E+00 | 0,00E+00 | 1,52E-01 | 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 $CO_2$e | 7,96E+00 | 2,98E-03 | 1,56E+00 | 9,52E+00 | 2,01E-01 | 4,06E-02 | ND | ND | ND | ND | ND | 2,59E+01 | ND | 0,00E+00 | 1,82E-02 | 7,54E-02 | 5,56E-02 | -3,31E+00 |
| Ozone depletion Pot. | kg $CFC_{-11}$e | 1,52E-07 | 3,54E-11 | 1,22E-08 | 1,64E-07 | 2,32E-09 | 9,38E-11 | ND | ND | ND | ND | ND | 6,00E-07 | ND | 0,00E+00 | 2,04E-10 | 1,67E-10 | 7,11E-11 | -1,33E-08 |
| Acidification | kg $SO_2$e | 6,76E-02 | 6,19E-06 | 7,95E-03 | 7,55E-02 | 3,84E-03 | 3,24E-05 | ND | ND | ND | ND | ND | 2,37E-01 | ND | 0,00E+00 | 4,67E-05 | 1,40E-04 | 2,36E-05 | -6,94E-02 |
| Eutrophication | kg $PO_4^{3}$e | 1,18E-02 | 1,49E-06 | 2,03E-03 | 1,38E-02 | 4,37E-04 | 2,83E-05 | ND | ND | ND | ND | ND | 2,94E-02 | ND | 0,00E+00 | 1,14E-05 | 2,15E-05 | 1,07E-05 | -3,27E-03 |
| POCP ("smog") | kg $C_2H_4$e | 4,17E-03 | 5,83E-07 | 3,79E-04 | 4,55E-03 | 1,95E-04 | 8,15E-06 | ND | ND | ND | ND | ND | 1,28E-02 | ND | 0,00E+00 | 4,18E-06 | 8,14E-06 | 2,21E-06 | -3,34E-03 |
| ADP-elements | kg Sbe | 3,77E-04 | 9,31E-09 | 9,45E-07 | 3,78E-04 | 2,71E-07 | 5,60E-08 | ND | ND | ND | ND | ND | 2,78E-03 | ND | 0,00E+00 | 5,87E-08 | 6,38E-07 | 1,12E-08 | -8,10E-04 |
| ADP-fossil | MJ | 8,58E+01 | 4,20E-02 | 1,76E+01 | 1,04E+02 | 2,55E+00 | 1,09E-01 | ND | ND | ND | ND | ND | 1,63E+02 | ND | 0,00E+00 | 2,53E-01 | 2,37E-01 | 7,29E-02 | -3,12E+01 |

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## 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 $CO_2e$ | 7,97E+00 | 3,00E-03 | 1,55E+00 | 9,52E+00 | 2,02E-01 | 1,71E-02 | ND | ND | ND | ND | ND | 2,57E+01 | ND | 0,00E+00 | 1,83E-02 | 7,55E-02 | 5,57E-02 | -3,33E+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 characterization factor for biogenic CO2 is set to zero.*

# ENVIRONMENTAL IMPACT DATA, RESULTS PER FUNCTIONAL UNIT

*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-C

| 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 $CO_2$ éq/FU | 4,88E+00 | 1,82E-03 | 7,82E-01 | 5,66E+00 | 1,23E-01 | 1,56E-01 | ND | ND | ND | ND | ND | 1,59E+01 | ND | 0,00E+00 | 1,11E-02 | 4,59E-02 | 3,39E-02 | -2,04E+00 |
| GWP – fossil | kg $CO_2$ éq/FU | 4,85E+00 | 1,82E-03 | 9,38E-01 | 5,79E+00 | 1,23E-01 | 1,04E-02 | ND | ND | ND | ND | ND | 1,41E+01 | ND | 0,00E+00 | 1,11E-02 | 4,60E-02 | 3,39E-02 | -2,03E+00 |
| GWP – biogenic | kg $CO_2$ éq/FU | 2,54E-02 | 4,08E-07 | -1,60E-01 | -1,34E-01 | 2,11E-05 | 1,46E-01 | ND | ND | ND | ND | ND | 2,56E-01 | ND | 0,00E+00 | 2,43E-06 | -3,31E-05 | -4,07E-06 | -1,19E-02 |
| GWP – LULUC | kg $CO_2$ éq/FU | 3,19E-03 | 8,23E-07 | 3,56E-03 | 6,74E-03 | 6,41E-05 | 3,50E-06 | ND | ND | ND | ND | ND | 1,58E+00 | ND | 0,00E+00 | 4,93E-06 | 2,06E-05 | 3,48E-06 | -5,90E-04 |
| Ozone depletion pot. | kg $CFC_{-11}$e/FU | 1,21E-07 | 2,70E-11 | 7,64E-09 | 1,28E-07 | 1,78E-09 | 6,99E-11 | ND | ND | ND | ND | ND | 4,22E-07 | ND | 0,00E+00 | 1,56E-10 | 1,20E-10 | 5,33E-11 | -8,90E-09 |
| Acidification potential | mole $H^+$e/FU | 4,81E-02 | 4,77E-06 | 5,74E-03 | 5,38E-02 | 2,93E-03 | 2,57E-05 | ND | ND | ND | ND | ND | 1,72E-01 | ND | 0,00E+00 | 3,71E-05 | 1,06E-04 | 1,97E-05 | -4,82E-02 |
| EP-freshwater[2)] | kg Pe/FU | 3,23E-03 | 1,43E-07 | 2,34E-04 | 3,47E-03 | 5,09E-06 | 9,73E-07 | ND | ND | ND | ND | ND | 1,25E-02 | ND | 0,00E+00 | 8,66E-07 | 6,36E-06 | 4,86E-07 | -2,60E-03 |
| EP-marine | kg Ne/FU | 6,06E-03 | 1,28E-06 | 9,32E-04 | 6,99E-03 | 7,37E-04 | 2,49E-05 | ND | ND | ND | ND | ND | 2,54E-02 | ND | 0,00E+00 | 1,20E-05 | 2,46E-05 | 2,31E-05 | -3,39E-03 |
| EP-terrestrial | mol Ne/FU | 6,36E-02 | 1,39E-05 | 7,92E-03 | 7,16E-02 | 8,18E-03 | 8,31E-05 | ND | ND | ND | ND | ND | 2,60E-01 | ND | 0,00E+00 | 1,31E-04 | 2,62E-04 | 8,61E-05 | -3,97E-02 |
| POCP ("smog")[3)] | kg NMVOCe/ | 2,02E-02 | 6,82E-06 | 2,33E-03 | 2,25E-02 | 2,26E-03 | 3,25E-05 | ND | ND | ND | ND | ND | 6,92E-02 | ND | 0,00E+00 | 5,17E-05 | 7,45E-05 | 2,64E-05 | -1,19E-02 |
| ADP-minerals & metals[4)] | kg Sbe/FU | 2,31E-04 | 5,81E-09 | 5,85E-07 | 2,32E-04 | 1,68E-07 | 3,50E-08 | ND | ND | ND | ND | ND | 1,69E-03 | ND | 0,00E+00 | 3,66E-08 | 3,90E-07 | 7,51E-09 | -4,94E-04 |
| ADP-fossil resources | MJ/FU | 5,74E+01 | 2,59E-02 | 1,09E+01 | 6,83E+01 | 1,57E+00 | 7,09E-02 | ND | ND | ND | ND | ND | 1,88E+03 | ND | 0,00E+00 | 1,56E-01 | 1,63E-01 | 4,52E-02 | -2,11E+01 |
| Water use[5)] | $m^3$e priv. /FU | 1,35E+00 | 1,23E-04 | 7,26E+00 | 8,62E+00 | 5,19E-03 | 1,78E-03 | ND | ND | ND | ND | ND | 1,04E+02 | ND | 0,00E+00 | 7,25E-04 | 4,99E-03 | 1,70E-03 | -3,19E-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 /FU | 2,93E-07 | 1,50E-10 | 1,89E-08 | 3,12E-07 | 5,51E-09 | 4,16E-10 | ND | ND | ND | ND | ND | 1,44E-06 | ND | 0,00E+00 | 8,84E-10 | 1,22E-09 | 3,66E-10 | -1,44E-07 |
| Ionizing radiation[6)] | kBq U235e/FU | 3,16E-01 | 2,16E-05 | 2,03E-02 | 3,36E-01 | 8,66E-04 | 2,68E-04 | ND | ND | ND | ND | ND | 1,35E+02 | ND | 0,00E+00 | 1,26E-04 | 1,17E-03 | 5,42E-05 | -1,31E-01 |
| Ecotoxicity (freshwater) | CTUe/FU | 5,09E+01 | 3,98E-03 | 2,60E+00 | 5,35E+01 | 1,41E-01 | 4,85E-01 | ND | ND | ND | ND | ND | 2,36E+02 | ND | 0,00E+00 | 2,47E-02 | 1,27E-01 | 3,36E+00 | -3,02E+01 |
| Human toxicity, cancer | CTUh/FU | 4,30E-09 | 3,04E-13 | 1,29E-10 | 4,43E-09 | 2,49E-11 | 3,61E-12 | ND | ND | ND | ND | ND | 2,78E-08 | ND | 0,00E+00 | 1,89E-12 | 9,71E-12 | 3,00E-11 | -4,72E-09 |
| Human tox. non-cancer | CTUh/FU | 1,64E-07 | 1,65E-11 | 6,36E-09 | 1,70E-07 | 5,36E-10 | 1,86E-10 | ND | ND | ND | ND | ND | 1,45E-06 | ND | 0,00E+00 | 9,78E-11 | 6,01E-10 | 5,96E-10 | -4,42E-07 |
| SQP[7)] | -/FU | 1,58E+01 | 1,88E-02 | 8,68E+00 | 2,45E+01 | 4,78E-01 | 4,86E-02 | ND | ND | ND | ND | ND | 4,44E+02 | ND | 0,00E+00 | 9,33E-02 | 1,52E-01 | 7,18E-02 | -1,59E+01 |

*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/FU | 3,59E+00 | 3,58E-04 | 2,39E-01 | 3,83E+00 | 1,43E-02 | -1,82E+00 | ND | ND | ND | ND | ND | 1,29E+03 | ND | 0,00E+00 | 2,14E-03 | 2,34E-02 | 9,42E-04 | -1,23E+00 |
| Renew. PER as material | MJ/FU | 0,00E+00 | 0,00E+00 | 1,43E+00 | 1,43E+00 | 0,00E+00 | -1,43E+00 | ND | ND | ND | ND | ND | 0,00E+00 | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Total use of renew. PER | MJ/FU | 3,59E+00 | 3,58E-04 | 1,67E+00 | 5,26E+00 | 1,43E-02 | -3,24E+00 | ND | ND | ND | ND | ND | 1,29E+03 | ND | 0,00E+00 | 2,14E-03 | 2,34E-02 | 9,42E-04 | -1,23E+00 |
| Non-re. PER as energy | MJ/FU | 5,64E+01 | 2,59E-02 | 1,08E+01 | 6,73E+01 | 1,57E+00 | -9,44E-02 | ND | ND | ND | ND | ND | 1,88E+03 | ND | 0,00E+00 | 1,56E-01 | -3,45E-01 | -5,24E-01 | -2,11E+01 |
| Non-re. PER as material | MJ/FU | 9,56E-01 | 0,00E+00 | 1,82E-01 | 1,14E+00 | 0,00E+00 | -1,98E-01 | ND | ND | ND | ND | ND | 0,00E+00 | ND | 0,00E+00 | 0,00E+00 | -4,12E-01 | -5,28E-01 | 0,00E+00 |
| Total use of non-re. PER | MJ/FU | 5,74E+01 | 2,59E-02 | 1,10E+01 | 6,84E+01 | 1,57E+00 | -2,93E-01 | ND | ND | ND | ND | ND | 1,88E+03 | ND | 0,00E+00 | 1,56E-01 | -7,57E-01 | -1,05E+00 | -2,11E+01 |
| Secondary materials | kg/FU | 4,24E-02 | 0,00E+00 | 0,00E+00 | 4,24E-02 | 0,00E+00 | 0,00E+00 | ND | ND | ND | ND | ND | 0,00E+00 | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Renew. secondary fuels | MJ/FU | 1,58E-03 | 1,47E-07 | 1,20E-02 | 1,36E-02 | 3,30E-06 | 6,26E-07 | ND | ND | ND | ND | ND | 1,67E-03 | ND | 0,00E+00 | 8,94E-07 | 7,69E-06 | 6,81E-07 | -1,86E-04 |
| Non-ren. secondary fuels | MJ/FU | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | ND | ND | ND | ND | ND | 0,00E+00 | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Use of net fresh water | $m^3$/FU | 3,31E-02 | 3,62E-06 | 1,38E-02 | 4,69E-02 | 1,37E-04 | -8,49E-06 | ND | ND | ND | ND | ND | 2,47E+00 | ND | 0,00E+00 | 2,07E-05 | 1,16E-04 | -4,83E-05 | -1,78E-02 |

*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/FU | 9,10E-01 | 4,49E-05 | 9,81E-03 | 9,19E-01 | 2,22E-03 | 5,97E-04 | ND | ND | ND | ND | ND | 1,92E+00 | ND | 0,00E+00 | 2,72E-04 | 1,73E-03 | 2,58E-02 | -5,04E-01 |
| Non-hazardous waste | kg/FU | 1,57E+01 | 8,40E-04 | 3,73E-01 | 1,61E+01 | 3,32E-02 | 7,91E-02 | ND | ND | ND | ND | ND | 6,37E+01 | ND | 0,00E+00 | 5,11E-03 | 4,56E-02 | 2,48E-01 | -1,33E+01 |
| Radioactive waste | kg/FU | 7,74E-05 | 5,28E-09 | 3,76E-06 | 8,12E-05 | 2,11E-07 | 6,82E-08 | ND | ND | ND | ND | ND | 2,89E-02 | ND | 0,00E+00 | 3,10E-08 | 2,88E-07 | 1,33E-08 | -3,21E-05 |

## 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/FU | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | ND | ND | ND | ND | ND | 0,00E+00 | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Materials for recycling | kg/FU | 0,00E+00 | 0,00E+00 | 1,78E-03 | 1,78E-03 | 0,00E+00 | 9,35E-02 | ND | ND | ND | ND | ND | 0,00E+00 | ND | 0,00E+00 | 0,00E+00 | 2,00E-01 | 0,00E+00 | 0,00E+00 |
| Materials for energy rec | kg/FU | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | ND | ND | ND | ND | ND | 0,00E+00 | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Exported energy | MJ/FU | 0,00E+00 | 0,00E+00 | 2,09E-03 | 2,09E-03 | 0,00E+00 | 6,96E-02 | ND | ND | ND | ND | ND | 0,00E+00 | ND | 0,00E+00 | 0,00E+00 | 1,59E-01 | 0,00E+00 | 0,00E+00 |
| Exported energy: Electricity | MJ/FU | 0,00E+00 | 0,00E+00 | 8,79E-04 | 8,79E-04 | 0,00E+00 | 2,93E-02 | ND | ND | ND | ND | ND | 0,00E+00 | ND | 0,00E+00 | 0,00E+00 | 6,71E-02 | 0,00E+00 | 0,00E+00 |
| Exported energy: Heat | MJ/FU | 0,00E+00 | 0,00E+00 | 1,21E-03 | 1,21E-03 | 0,00E+00 | 3,76E-02 | ND | ND | ND | ND | ND | 0,00E+00 | ND | 0,00E+00 | 0,00E+00 | 9,23E-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 $CO_2$ éq./FU | 4,84E+00 | 1,81E-03 | 9,49E-01 | 5,79E+00 | 1,23E-01 | 2,47E-02 | ND | ND | ND | ND | ND | 1,58E+01 | ND | 0,00E+00 | 1,11E-02 | 4,59E-02 | 3,39E-02 | -2,01E+00 |
| Ozone depletion Pot. | kg $CFC_{-11}$e/FU | 9,27E-08 | 2,16E-11 | 7,42E-09 | 1,00E-07 | 1,41E-09 | 5,71E-11 | ND | ND | ND | ND | ND | 3,65E-07 | ND | 0,00E+00 | 1,24E-10 | 1,01E-10 | 4,33E-11 | -8,10E-09 |
| Acidification | kg $SO_2$e/FU | 4,11E-02 | 3,77E-06 | 4,84E-03 | 4,60E-02 | 2,34E-03 | 1,97E-05 | ND | ND | ND | ND | ND | 1,44E-01 | ND | 0,00E+00 | 2,84E-05 | 8,50E-05 | 1,44E-05 | -4,23E-02 |
| Eutrophication | kg $PO_4^{3}$e/FU | 7,17E-03 | 9,07E-07 | 1,24E-03 | 8,40E-03 | 2,66E-04 | 1,72E-05 | ND | ND | ND | ND | ND | 1,79E-02 | ND | 0,00E+00 | 6,92E-06 | 1,31E-05 | 6,54E-06 | -1,99E-03 |
| POCP (“smog”) | kg $C_2H_4$e/FU | 2,54E-03 | 3,55E-07 | 2,31E-04 | 2,77E-03 | 1,19E-04 | 4,96E-06 | ND | ND | ND | ND | ND | 7,81E-03 | ND | 0,00E+00 | 2,55E-06 | 4,95E-06 | 1,34E-06 | -2,03E-03 |
| ADP-elements | kg Sbe/FU | 2,30E-04 | 5,67E-09 | 5,75E-07 | 2,30E-04 | 1,65E-07 | 3,41E-08 | ND | ND | ND | ND | ND | 1,69E-03 | ND | 0,00E+00 | 3,57E-08 | 3,88E-07 | 6,79E-09 | -4,93E-04 |
| ADP-fossil | MJ/FU | 5,23E+01 | 2,55E-02 | 1,07E+01 | 6,30E+01 | 1,55E+00 | 6,63E-02 | ND | ND | ND | ND | ND | 9,94E+01 | ND | 0,00E+00 | 1,54E-01 | 1,44E-01 | 4,44E-02 | -1,90E+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 $CO_2e$/FU | 4,85E+00 | 1,82E-03 | 9,42E-01 | 5,80E+00 | 1,23E-01 | 1,04E-02 | ND | ND | ND | ND | ND | 1,57E+01 | ND | 0,00E+00 | 1,11E-02 | 4,60E-02 | 3,39E-02 | -2,03E+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 characterization factor for biogenic CO2 is set to zero.*

## SCENARIO DOCUMENTATION
## DATA SOURCES

### Manufacturing energy scenario documentation – A3 (Energy data source)

1. Electricity, Electricity, consumption mix w/o renewables, China, 2023, China, LCA study for country specific consumption mixes, OneClickLCA 2025, 1.15 kgCO2e/kWh

### Transport scenario documentation - A4

1. Transport, freight, sea, container ship, 18932 km
2. Transport, freight, lorry >32 metric ton, EURO5, 44.0 km
3. Transport, freight, lorry >32 metric ton, EURO5, 450.0 km

### Installation scenario documentation - A5 (Waste materials data source)

1. Corrugated board box production, 0.17795 kg
2. Operation, printer, laser, black/white, per kg printed paper, 0.006 kg
3. Packaging film production, low density polyethylene, 0.007 kg

### Use stages scenario documentation - B6-B7 (Energy data source)

1. Energy supply, electricity transformation and distribution, distribution low voltage, Market for electricity, low voltage, Sweden, 700.0 kWh

## TRANSPORT SCENARIO DOCUMENTATION - A4

| Scenario parameter | Value |
|---|---|
| Capacity utilization (including empty return) % | 50 % |
| Bulk density of transported products / kg/m³ | 291 |
| Volume capacity utilization factor (factor: =1 or <1 or ≥1 for compressed or nested packaged products) | 1 |

## INSTALLATION SCENARIO DOCUMENTATION - A5

| Scenario parameter | Value | |
|---|---|---|
| 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) | Paper/Cardboard packaging | |
| | Recycling | 82% |
| | Energy recovery | 9% |
| | Disposal | 9% |
| Ancillary materials for installation (specified by material) / kg or other units as appropriate | 0 | |
| Water use / m³ | 0 | |
| Other resource use / kg | 0 | |
| Direct emissions to ambient air, soil and water / kg | 0 | |

## USE STAGES SCENARIO DOCUMENTATION - B6-B7 USE OF ENERGY AND WATER

| Scenario information | Value |
|---|---|
| Ancillary materials specified by material / kg or units as appropriate | Not applicable |
| Net fresh water consumption / m³ | 0 |
| Power output of equipment / W | 14 |
| Characteristic performance, e.g., energy efficiency, emissions, variation of performance with capacity utilization, etc. / Units as appropriate | N/A |
| Further assumptions for scenario development, e.g., frequency and period of use, number of occupants / Units as appropriate | N/A |

## END OF LIFE SCENARIO DOCUMENTATION

| Scenario information | Value |
|---|---|
| Collection process – kg collected separately | 0,6262 |
| Collection process – kg collected with mixed construction waste | 0 |
| Recovery process – kg for re-use | 0 |
| Recovery process – kg for recycling | 0,33 |
| Recovery process – kg for energy recovery | 0 |
| Disposal (total) – kg for final deposition | 0,27 |
| Scenario assumptions e.g. transportation | Lorry, 16-32 metric ton, EURO5; 150 km |

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# 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.

Program assistant: Xinyuan Zhang

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: Hai Ha Nguyen
Tool verification validity: 28 March 2025 - 27 March 2028

# ANNEX : Scaling table with coefficients for total Echo S family

This section apply the Rule(s) for extrapolation to a homogeneous environmental family" of the current PCR (PSR-0014-ED2.0-EN-2023 07 13) of the Product Environmental Profiles (PEP).

Note:The extrapolation coefficients are intended at product level(declared unit)and not at functional unit

According Extrapolation rules applied to fabrication stage (A1-A3),distribution stage(A4),Installation stage(A5),Use stage(B6),End of Life stage(C1-C4) and net benefits beyond the system boundaries stage (D).

**Table A1 Scaled GWP per scaling factor**

| Product name | E-number | Wattage | CCT | CRI | Lumen | Variety | corresponding factor A1-A3 | GWP A1-A3-total kg CO2e | corresponding factor A4 | GWP A4-total kg CO2e | corresponding factor A5 | GWP A5-total kg CO2e | corresponding factor B6 | GWP B6-total kg CO2e | corresponding factor Module C | GWP Module C-total kg CO2e | corresponding factor Module D | GWP Module D-total kg CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Echo S 125 Vit | 7474807 | 14W | 3000K/4000k/5700k | 80 | 1150LM | Reference Product,Cutout 102-113mm,Triac dimmable | 1.000 | 9.250 | 1.000 | 0.160 | 1.000 | 0.257 | 1.000 | 26.200 | 1.000 | 0.083 | 1.000 | -3.270 |
| Echo S 125 Vit DALI | 7474808 | 14W | 3000K/4000k/5700k | 80 | 1150LM | Cutout 102-113mm,,DALI control | 1.132 | 10.467 | 1.104 | 0.177 | 1.000 | 0.257 | 0.500 | 13.100 | 1.168 | 0.097 | 1.132 | -3.700 |
| Echo S 150 Vit | 7476817 | 14W | 3000K/4000k/5700k | 80 | 1150LM | Cutout 108-145mm,Triac dimmable | 1.000 | 9.250 | 1.000 | 0.160 | 1.000 | 0.257 | 1.000 | 26.200 | 1.000 | 0.083 | 1.000 | -3.270 |
| Echo S 150 Vit DALI | 7476818 | 14W | 3000K/4000k/5700k | 80 | 1150LM | Cutout 108-145mm,,DALI control | 1.132 | 10.467 | 1.104 | 0.177 | 1.000 | 0.257 | 0.500 | 13.100 | 1.168 | 0.097 | 1.132 | -3.700 |
| Echo S 170 Vit | 7476819 | 14W | 3000K/4000k/5700k | 80 | 1150LM | Cutout 144-158mm,Triac dimmable | 1.312 | 12.140 | 1.234 | 0.197 | 1.788 | 0.459 | 1.000 | 26.200 | 1.063 | 0.088 | 1.312 | -4.292 |
| Echo S 170 Vit DALI | 7476820 | 14W | 3000K/4000k/5700k | 80 | 1150LM | Cutout 144-158mm,,DALI control | 1.397 | 12.920 | 1.337 | 0.214 | 1.788 | 0.459 | 0.500 | 13.100 | 1.215 | 0.101 | 1.397 | -4.567 |
| Echo S 215 Vit | 7476821 | 14W | 3000K/4000k/5700k | 80 | 1150LM | Cutout 150-200mm,Triac dimmable | 1.613 | 14.917 | 1.428 | 0.228 | 2.334 | 0.600 | 1.000 | 26.200 | 1.155 | 0.096 | 1.613 | -5.273 |
| Echo S 215 Vit DALI | 7476822 | 14W | 3000K/4000k/5700k | 80 | 1150LM | Cutout 150-200mm,,DALI control | 1.666 | 15.411 | 1.531 | 0.245 | 2.334 | 0.600 | 0.500 | 13.100 | 1.287 | 0.107 | 1.666 | -5.448 |
| Echo S 270 Vit | 7476823 | 14W | 3000K/4000k/5700k | 80 | 1150LM | Cutout 195-250mm,Triac dimmable | 1.841 | 17.027 | 1.661 | 0.266 | 2.537 | 0.652 | 1.000 | 26.200 | 1.445 | 0.120 | 1.841 | -6.019 |
| Echo S 270 Vit DALI | 7476824 | 14W | 3000K/4000k/5700k | 80 | 1150LM | Cutout 195-250mm,,DALI control | 1.874 | 17.331 | 1.764 | 0.282 | 2.537 | 0.652 | 0.500 | 13.100 | 1.530 | 0.127 | 1.874 | -6.127 |