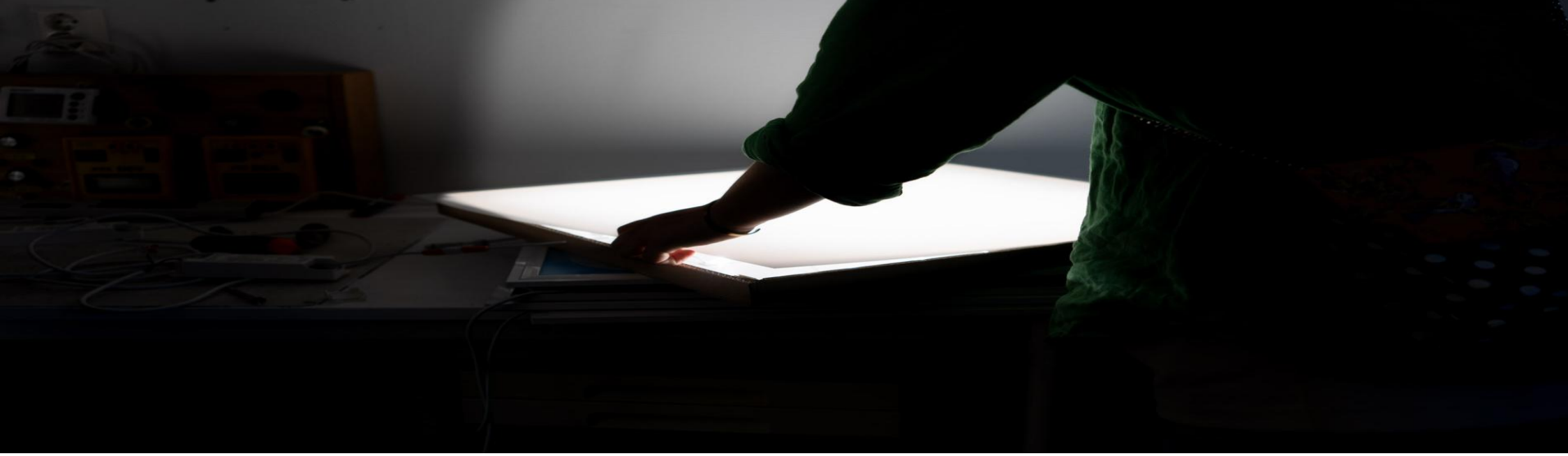


ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

EPD HUB, Draft version – not verified
Draft version, last updated on 29 May 2026

Elira Bio-Panel Opal

Lumine North

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.

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Lumine North
Address	Östanvindsgatan 1, 652 21 Karlstad, Sweden
Contact details	info@lumine.se
Website	https://www.luminenorth.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	Design phase EPD
Parent EPD number	
Scope of the EPD	Cradle to gate with options, A4-B7, and modules C1-C4, D
EPD author	Inna Gånheim, OptiCert AB
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☐ External verification
EPD verifier	Third-party verifier not appointed

PRODUCT

Product name	Elira Bio-Panel Opal
Additional labels	
Product reference	1110000
Place(s) of raw material origin	Global, mainly EU
Place of production	Karlstad, Sweden
Place(s) of installation and use	Europe
Period for data	01-03-2026 to 31-03-2026
Averaging in EPD	No grouping
Variation in GWP-fossil for A1-A3 (%)	-
GTIN (Global Trade Item Number)	7350181160004
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	12,5

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 unit of luminaire
Declared unit mass	1,01 kg
Mass of packaging	0,105 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	11,2
GWP-total, A1-A3 ($kgCO_2e$)	10,5
Secondary material, inputs (%)	35,7
Total energy use, A1-A3 (kWh)	43,9
Net freshwater use, A1-A3 (m^3)	0,09

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Lumine North is a Swedish lighting manufacturer specialising in luminaires that combine advanced LED technology with biobased materials. The company focuses on durable, circular and resource-efficient product solutions with reduced environmental impact. Products are developed and assembled in Värmland, Sweden, using renewable materials sourced from Swedish forests. Lumine North builds on more than 30 years of experience in lighting technology.

PRODUCT DESCRIPTION

The product is a LED luminaire intended for use in commercial and public indoor environments such as offices, educational facilities, and other large interior spaces. The luminaire features a lightweight chassis made primarily from biobased cellulose fiber, developed to reduce material-related climate impact while maintaining high technical performance and long service life. The design integrates efficient LED technology with optimized thermal management and is suitable for use in modern, sustainable building projects. The luminaire allows three different CCT settings to maximize flexibility and user-friendliness.

The declared product includes the LED module and integrated control components such as a DIP switch. Driver units are not included and are supplied separately depending on the end-user's control system and project-specific requirements.

Further information can be found at:
https://www.luminenorth.se/

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	14	Globalt
Minerals	2	Globalt
Fossil materials	29	Globalt
Bio-based materials	55	Europe/Sweden

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0,222
Biogenic carbon content in packaging, kg C	0,008

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 unit of luminaire
Mass per declared unit	1,01 kg
Functional unit	The luminaire has a reference service life of 100,000 operating hours (approx. 57 years based on 8 h/day and 220 days/year). The RSL is based on the specified LED lifetime under the assumed operating conditions.
Reference service life	57 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	x	x	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	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.
All components are transported to the production facility, where the main manufacturing process consists of assembly of the luminaire. No energy-intensive manufacturing processes beyond component production are involved.
No material losses occur during the assembly process.
The manufacturing stage (A3) contributes less than 1% to the total climate impact of the product stage (A1–A3). The product is packaged using corrugated cardboard packaging.
Driver units are excluded from the system boundary.
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.

Transport to the construction site (A4) is modelled as a representative Swedish distribution scenario, used as a proxy for typical European transport conditions. As the product has not yet been distributed to the market, the transport scenario is based on a representative average of expected deliveries. The product is manufactured in Karlstad and is assumed to be distributed across Sweden, with deliveries to both larger cities and other regions.
An average transport distance of 400 km has been assumed to represent this distribution. Transport is modelled using a lorry (16–32 tonnes, Euro 5/6), representing typical distribution conditions.
Environmental impacts from installation (A5) are limited to packaging waste. No additional materials, energy use, or wastewater are generated during installation.

PRODUCT USE AND MAINTENANCE (B1-B7)

The product consumes electricity during the use phase, and the scenario in this study is based on the selected electricity mix (B6). No energy savings due to controls are included in the scenario.
The declared reference service life (RSL) is 100,000 operating hours, corresponding to approximately 57 years under the assumed usage conditions. Based on an average power consumption of 35 W, this corresponds to a total electricity use of 3,500 kWh over the declared service life. The selected RSL is based on the specified LED lifetime under the assumed operating conditions.
The stated average power is based on the use of Constant Light Output (CLO), where the luminaire operates at a lower power initially and gradually increases power over time to maintain a constant luminous output. The CLO function is typically managed by the driver. The driver is not included in the declared product and is assumed to be supplied separately depending on the installation.
The product is designed for long service life and efficient maintenance. Key components such as the LED module and diffuser can be replaced when required, supporting extended use of the housing beyond the declared reference service life. However, no component replacement scenario is modelled within the declared RSL.
Environmental impacts from electricity production include direct emissions to air, as well as impacts from transformation and transmission losses.
Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

Energy and resource use during the demolition phase (C1) is assumed to be negligible. It is assumed that the product is collected separately and

transported to a waste treatment facility. The transport distance is based on standard values from the applied dataset and represents an average transport scenario (C2).

According to EN 50693:2019, end-of-life treatment includes depollution, fraction separation and pre-treatment (dismantling, crushing, shredding, and sorting), followed by recycling, energy recovery, and disposal (C3–C4). In this study, default values from EN 50693 are used to model the treatment of different materials.

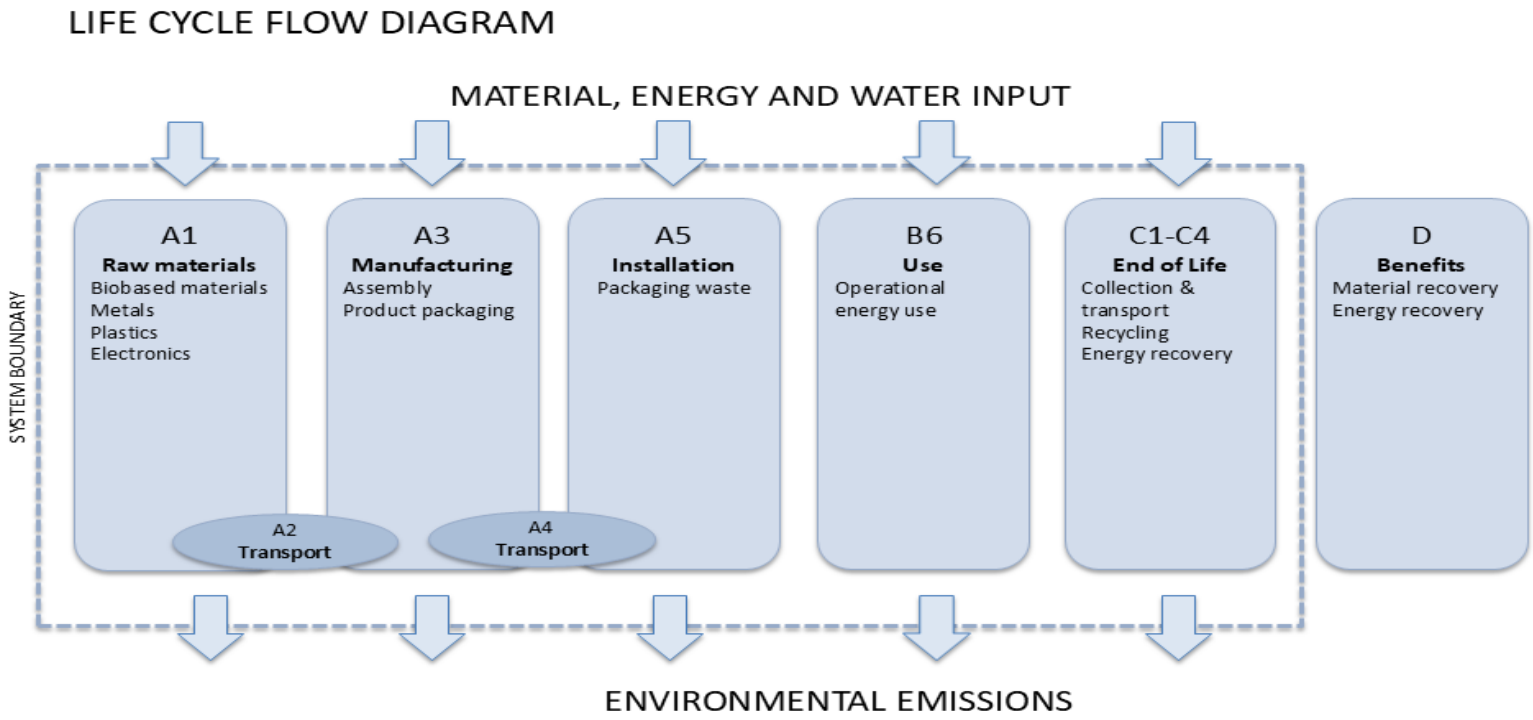
The product contains a high share of biobased materials (cellulose), which are largely recycled. Metals are assumed to be recovered and used as secondary raw materials, while other materials are treated through energy recovery or disposal depending on material type.

The benefits and loads from recycling and energy recovery are reported in Module D.
Typical end-of-life treatment scenarios applied in this study are based on EN 50693 and average European waste treatment assumptions.

Metals are primarily recycled and used as secondary raw materials. Corrugated cardboard packaging is assumed to be recycled. Plastic materials are mainly treated through energy recovery, while selected material fractions are recycled depending on material type and local waste treatment practices.

Landfill is assumed to be negligible.

MANUFACTURING PROCESS



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

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

All industrial processes from raw material acquisition and pre-processing, production, product distribution, installation, use of the product, and end-of-life management are included. All relevant materials and components have been included in the modelling.

Water used for cleaning and maintenance of equipment, as well as transportation and waste treatment of packaging materials used for delivering raw materials to the factory, are excluded as their contribution is considered negligible. The production of capital equipment, construction activities, and infrastructure, personnel-related activities, and energy and water use related to company management and sales activities are also 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	No allocation
Packaging material	Allocated by mass or volume
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

This LCA study is conducted in accordance with all methodological considerations, such as performance, system boundaries, data quality, allocation procedures, and decision rules to evaluate inputs and outputs. Allocation used in Ecoinvent v3.10.1 / 3.11 environmental data sources follows the methodology 'allocation, cut-off by classification', which is in line with the requirements of EN 15804.
All estimations and assumptions regarding the cut-off criteria and allocation are declared in the section "Cut-off Criteria, except for the following:
• Module A2, A4 & C2: Vehicle capacity utilization volume factor is assumed to be 1 (full load). Variations in load are considered negligible due to the limited contribution of transport to total results. Empty returns are not included, as return trips are assumed to be used for other deliveries.
• Module A4: Transportation does not cause losses as products are properly packaged. Transport distances are based on a representative average

scenario, and transport is modelled using a lorry.
• Module B6: Electricity consumption is calculated based on continuous operation over the declared reference service life using Constant Light Output (CLO). No component replacement is modelled within the declared RSL. However, the product is designed to allow replacement of key components such as the LED module and diffuser, enabling continued use beyond the declared reference service life.
• Module C2: Transport to waste treatment is based on default dataset values and modelled as lorry transport.
• Module C3, C4, D: The product undergoes dismantling, and materials are sorted into metals, plastics, and biobased materials. Waste treatment scenarios are based on EN 50693. Recycled materials are assumed to replace primary raw materials, while energy recovery contributes to substitution of conventional energy production.

PRODUCT & MANUFACTURING SITES GROUPING

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

There is no average result considered in this study since this EPD refers to one specific product produced in one production plant.

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‘.

Ecoinvent database v3.10.1 and v3.11; EN 15804:2012+A2:2019; EN 50693:2019; EPD Hub PCR v1.2; ISO 14040:2006; ISO 14044:2006

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	8,98E+00	1,38E+00	1,03E-01	1,05E+01	8,59E-02	3,33E-02	ND	ND	ND	ND	ND	1,22E+02	ND	0,00E+00	1,81E-02	1,10E+00	2,58E-01	-8,56E-01
GWP – fossil	kg CO_2e	9,75E+00	1,38E+00	1,28E-01	1,12E+01	8,59E-02	3,79E-03	ND	ND	ND	ND	ND	1,05E+02	ND	0,00E+00	1,81E-02	3,65E-01	1,84E-01	-8,29E-01
GWP – biogenic	kg CO_2e	-8,00E-01	9,65E-05	-2,94E-02	-8,30E-01	1,70E-05	2,95E-02	ND	ND	ND	ND	ND	4,29E+00	ND	0,00E+00	2,81E-06	7,39E-01	7,31E-02	-1,30E-02
GWP – LULUC	kg CO_2e	3,22E-02	6,66E-04	4,47E-03	3,73E-02	3,03E-05	2,08E-06	ND	ND	ND	ND	ND	1,26E+01	ND	0,00E+00	7,03E-06	1,34E-05	3,89E-06	-1,39E-02
Ozone depletion pot.	kg $CFC\text{-}_{11}$e	1,24E-06	2,00E-08	4,94E-09	1,27E-06	1,71E-09	3,83E-11	ND	ND	ND	ND	ND	3,43E-06	ND	0,00E+00	3,13E-10	2,18E-10	1,10E-10	-1,26E-08
Acidification potential	mol H^+e	7,41E-02	3,97E-02	7,08E-04	1,14E-01	2,69E-04	1,53E-05	ND	ND	ND	ND	ND	6,28E-01	ND	0,00E+00	5,92E-05	1,59E-04	6,24E-05	-8,18E-03
EP-freshwater[2)]	kg Pe	5,48E-03	4,12E-05	7,48E-05	5,60E-03	5,69E-06	8,45E-07	ND	ND	ND	ND	ND	4,14E-02	ND	0,00E+00	1,55E-06	6,07E-06	1,49E-06	-3,01E-03
EP-marine	kg Ne	1,21E-02	1,00E-02	2,91E-04	2,24E-02	9,05E-05	2,48E-05	ND	ND	ND	ND	ND	1,82E-01	ND	0,00E+00	1,94E-05	7,53E-05	2,78E-04	-1,69E-03
EP-terrestrial	mol Ne	1,22E-01	1,11E-01	2,07E-03	2,35E-01	9,85E-04	4,84E-05	ND	ND	ND	ND	ND	1,80E+00	ND	0,00E+00	2,11E-04	6,15E-04	2,70E-04	-2,12E-02
POCP ("smog")[3)]	kg NMVOCe	3,63E-02	3,01E-02	5,40E-04	6,69E-02	4,21E-04	1,85E-05	ND	ND	ND	ND	ND	4,28E-01	ND	0,00E+00	8,64E-05	1,62E-04	9,17E-05	-5,37E-03
ADP-minerals & metals[4)]	kg Sbe	4,55E-04	1,32E-06	2,37E-06	4,59E-04	2,81E-07	2,45E-08	ND	ND	ND	ND	ND	2,07E-03	ND	0,00E+00	6,08E-08	2,98E-07	1,74E-08	-4,88E-05
ADP-fossil resources	MJ	1,30E+02	1,69E+01	3,27E+00	1,50E+02	1,21E+00	3,46E-02	ND	ND	ND	ND	ND	1,57E+04	ND	0,00E+00	2,53E-01	1,85E-01	8,37E-02	-1,26E+01
Water use[5)]	m^3e depr.	3,98E+00	4,50E-02	1,17E-01	4,14E+00	5,92E-03	9,48E-04	ND	ND	ND	ND	ND	7,15E+02	ND	0,00E+00	1,31E-03	2,81E-02	1,34E-02	-1,21E+00

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	6,16E-07	4,20E-08	6,86E-09	6,64E-07	6,75E-09	2,05E-10	ND	ND	ND	ND	ND	1,00E-05	ND	0,00E+00	1,42E-09	1,32E-09	5,67E-10	-7,90E-08
Ionizing radiation[6)]	kBq U235e	8,99E-01	7,32E-03	1,25E-01	1,03E+00	1,54E-03	2,27E-04	ND	ND	ND	ND	ND	1,13E+03	ND	0,00E+00	2,67E-04	1,42E-03	1,51E-04	-2,03E-01
Ecotoxicity (freshwater)	CTUe	5,40E+01	1,24E+00	3,68E+01	9,20E+01	1,58E-01	1,24E-01	ND	ND	ND	ND	ND	7,18E+03	ND	0,00E+00	1,94E-01	1,07E+00	3,15E+02	-2,53E+02
Human toxicity, cancer	CTUh	4,57E-09	2,82E-10	5,39E-11	4,91E-09	1,46E-11	2,74E-12	ND	ND	ND	ND	ND	5,93E-08	ND	0,00E+00	3,07E-12	4,40E-11	1,71E-11	-1,07E-09
Human tox. non-cancer	CTUh	2,84E-07	4,23E-09	2,15E-09	2,90E-07	7,57E-10	1,46E-10	ND	ND	ND	ND	ND	2,79E-06	ND	0,00E+00	1,58E-10	1,63E-09	9,40E-10	-1,32E-08
SQP[7)]	-	8,13E+01	1,58E+00	4,73E+00	8,76E+01	7,18E-01	2,55E-02	ND	ND	ND	ND	ND	3,78E+03	ND	0,00E+00	1,50E-01	1,38E-01	1,09E-01	-4,08E+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	1,67E+01	1,23E-01	6,99E-01	1,75E+01	2,08E-02	-1,67E+00	ND	ND	ND	ND	ND	9,81E+03	ND	0,00E+00	3,94E-03	-8,03E+00	-7,92E-01	-4,72E+00
Renew. PER as material	MJ	6,62E+00	0,00E+00	1,35E+00	7,96E+00	0,00E+00	-1,35E+00	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	-6,02E+00	-5,95E-01	4,92E-02
Total use of renew. PER	MJ	2,33E+01	1,23E-01	2,04E+00	2,55E+01	2,08E-02	-3,01E+00	ND	ND	ND	ND	ND	9,81E+03	ND	0,00E+00	3,94E-03	-1,40E+01	-1,39E+00	-4,67E+00
Non-re. PER as energy	MJ	1,20E+02	1,69E+01	3,29E+00	1,41E+02	1,21E+00	3,46E-02	ND	ND	ND	ND	ND	1,57E+04	ND	0,00E+00	2,53E-01	-5,14E+00	-5,29E+00	-1,26E+01
Non-re. PER as material	MJ	9,80E+00	0,00E+00	4,40E-03	9,80E+00	0,00E+00	-4,40E-03	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	-4,48E+00	-4,39E+00	2,48E+00
Total use of non-re. PER	MJ	1,30E+02	1,69E+01	3,30E+00	1,50E+02	1,21E+00	3,02E-02	ND	ND	ND	ND	ND	1,57E+04	ND	0,00E+00	2,53E-01	-9,62E+00	-9,67E+00	-1,01E+01
Secondary materials	kg	3,61E-01	7,39E-03	1,04E-01	4,72E-01	5,52E-04	5,70E-05	ND	ND	ND	ND	ND	1,75E+00	ND	0,00E+00	1,13E-04	3,61E-04	4,76E-05	1,10E-01
Renew. secondary fuels	MJ	3,22E-02	1,92E-05	9,78E-03	4,20E-02	6,97E-06	3,22E-07	ND	ND	ND	ND	ND	6,02E-03	ND	0,00E+00	1,46E-06	4,94E-06	1,31E-06	-4,01E-05
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	8,81E-02	1,12E-03	2,79E-03	9,20E-02	1,62E-04	-1,97E-05	ND	ND	ND	ND	ND	1,66E+01	ND	0,00E+00	3,31E-05	4,80E-04	-3,92E-04	-2,63E-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	1,03E+00	2,07E-02	9,53E-03	1,06E+00	1,73E-03	5,85E-04	ND	ND	ND	ND	ND	1,10E+01	ND	0,00E+00	4,55E-04	8,51E-03	2,86E-03	-1,53E-01
Non-hazardous waste	kg	4,23E+01	2,85E-01	2,49E-01	4,28E+01	3,65E-02	6,65E-02	ND	ND	ND	ND	ND	2,71E+02	ND	0,00E+00	9,18E-03	2,60E-01	6,36E-01	-2,37E+00
Radioactive waste	kg	2,20E-04	1,78E-06	2,71E-05	2,49E-04	3,82E-07	5,78E-08	ND	ND	ND	ND	ND	2,41E-01	ND	0,00E+00	6,58E-08	3,64E-07	3,74E-08	-5,33E-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	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	0,00E+00	0,00E+00	0,00E+00	8,70E-02	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	5,64E-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	0,00E+00	0,00E+00	0,00E+00	4,10E-02	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	1,95E+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	1,70E-02	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	8,17E-01	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	2,40E-02	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	1,13E+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	9,73E+00	1,37E+00	1,33E-01	1,12E+01	8,53E-02	1,44E-02	ND	ND	ND	ND	ND	1,19E+02	ND	0,00E+00	1,80E-02	3,68E-01	2,36E-01	-8,43E-01
Ozone depletion Pot.	kg $CFC_{-11}e$	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Acidification	kg SO_2e	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Eutrophication	kg PO_4^3e	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
POCP (“smog”)	kg C_2H_4e	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ADP-elements	kg Sbe	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADP-fossil	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

ADDITIONAL INDICATOR – GWP-GHG

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG[9)]	kg CO_2e	9,78E+00	1,38E+00	1,32E-01	1,13E+01	8,59E-02	3,79E-03	ND	ND	ND	ND	ND	1,18E+02	ND	0,00E+00	1,81E-02	3,65E-01	1,84E-01	-8,43E-01

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

SCENARIO DOCUMENTATION

DATA SOURCES

Manufacturing energy scenario documentation

1. Electricity production, photovoltaic, 3kWp slanted-roof installation, multi-Si, panel, mounted, Sweden, Ecoinvent, 0.10 kgCO2e/kWh
2. Electricity, medium voltage, residual mix, Sweden, Ecoinvent, 0.0512 kgCO2e/kWh

Transport scenario documentation - A4 (Transport resources)

1. Transport, freight, lorry 16-32 metric ton, EURO5, 400 km

Transport to the building site (A4) - Scenario documentation

Scenario parameter	Value
Capacity utilization (including empty return) %	50
Bulk density of transported products	74,3
Volume capacity utilization factor	1

Installation at the building site (A5) - Scenario documentation

Scenario parameter	Value
Energy: type and consumption (MJ or kWh)	-
Water use (m^3)	-
Ancillary materials: type and mass (kg)	-
Waste materials: type and mass (kg)	0.105 kg (corrugated cardboard packaging)
Waste materials: output routes	Corrugated cardboard packaging: * 85% recycling * 15% energy recovery * 0% landfill
Direct emissions (kg)	-

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

Scenario information	Value
Type of energy, consumption (kWh)	Electricity, 3500 kWh
Freshwater consumption (m3)	0
Performance characteristics, E.g, Power rating, efficiency, capacity	Average power: 35 W; service life: 100,000 hours; Constant Light Output (CLO) applied

End of life (C1-C4) - Scenario documentation

Scenario information	Value
Collection process: collected separately (kg)	1,01
Collection process: Mixed waste (kg)	0
Recovery: re-use (kg)	0
Recovery: recycling (kg)	0,56
Recovery: energy recovery (kg)	0
Disposal (kg)	0
Scenario assumptions e.g. transportation (mode, km) & other	Transport based on default dataset values; waste treatment modelled according to EN 50693