

# Environmental Product Declaration



In accordance with ISO 14025 and EN 15804:2012+A2:2019/AC:2021 for:

## GA Casa Led Spot Track Light

from

**Lival Oy Ab**



Programme:	The International EPD® System, <a href="http://www.environdec.com">www.environdec.com</a>
Programme operator:	EPD International AB
EPD registration number:	S-P-12302
Publication date:	2024-01-23
Valid until:	2029-01-23


*An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at [www.environdec.com](http://www.environdec.com)*



## General information

### Programme information

<b>Programme:</b>	The International EPD® System
<b>Address:</b>	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
<b>Website:</b>	<a href="http://www.environdec.com">www.environdec.com</a>
<b>E-mail:</b>	<a href="mailto:info@environdec.com">info@environdec.com</a>

<b>Accountabilities for PCR, LCA and independent, third-party verification</b>
<b>Product Category Rules (PCR)</b>
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): 2019:14, Construction products, version 1.3.2. Un CPC code 4653 – Lighting equipment
PCR review was conducted by: The Technical Committee of the International EPD® System. A full list of members available on <a href="http://www.environdec.com">www.environdec.com</a> . The review panel may be contacted via <a href="mailto:info@environdec.com">info@environdec.com</a> . Chair of the PCR review: Claudia A. Peña.
<b>Life Cycle Assessment (LCA)</b>
LCA accountability: Minttu Valjakka, Environmental consultant. Organization: Ecobio Oy.
<b>Third-party verification</b>
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:  <input checked="" type="checkbox"/> EPD verification by individual verifier  Third-party verifier: Pär Lindman, Miljögraff    Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier:  <input type="checkbox"/> Yes <input type="checkbox"/> No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.



## **Company information**

Owner of the EPD: Lival Oy Ab

Contact: Elisabet Henriksson-Tekoniemi, [elisabet.henriksson-tekoniemi@lival.com](mailto:elisabet.henriksson-tekoniemi@lival.com) / Patrik Busk, [Patrik.Busk@lival.com](mailto:Patrik.Busk@lival.com)

### Description of the organisation:

Lival Group is a significant European provider of track lighting systems and luminaires. Thanks to manufacturing of complete lighting systems - Lival has become a leading manufacturer globally. Lival provides its customers with unique platforms of spotlights, Global branded tracks and adapters. Lival Group has two manufacturing sites in Finland, Lival in Sipoo and Nordic Aluminium in Kirkkonummi. The Group's net sales were 150M euros in year 2022 and it employed more than 100 persons.

### Product-related or management system-related certifications:

Product designation to standard EN 60598-2-1:1989 and EN 60598-1:2015.

Lival is certified according to SA 8000, OHSAS 18001, ISO 14001 and SMETA.

### Name and location of production site(s):

#### Aluminium cast body:

Foshan City Sunrise Lighting Technology Co., Ltd.

Guo Ruijun Factory, Guojia Development Zone, Shangan Community, Danzao Town, Nanhai District Foshan City, China

Printed circuit board (PCB) and luminaire:  
Signify Electronics Xiamen Co., Ltd.  
No.2000, North Yunding Road, Xiamen, China, 361009

Adapter assembly:  
EKOY, Eino Korhonen Oy.  
Teollisuustie 25, 06150 Porvoo, Finland.

Final assembly:  
Liisbet Tukat OÜ.  
Emmaste, Nurste, 92002 Hiiu maakond, Estonia

## Product information

Product name: GA Casa Led Spot Track Light

Product identification: GA Casa Led Spot Track Light's light source is light emitting diode (LED) with power output of 26 W. The product consists of aluminium cast body, printed circuit board (PCB), luminaire and adapter.

Product description: GA Casa Led Spot Track Light is used for lighting purpose in retail, hospitality, office, and home segments.

UN CPC code: Group 465 – Electric filament or discharge lamps; arc lamps; lighting equipment; parts thereof; Class 4653 – Lighting equipment.

Geographical scope: The production and assembly of components and the final product consider production locations in several different countries including Finland, Estonia and China. The use stage and end-of-life scenarios are based on main customer location which is Europe.

## LCA information

Functional unit / declared unit: The functional unit used in the study is lighting for one year with 26 W a lighting product. The product is used approximately 3 000 h per year for lighting purpose.

Conversion factor to mass: Mass of one lighting product is 0,429 kg.

Reference service life: 10 years.

Time representativeness: The data is collected covering production year 2022 for subcontractors responsible for the production of subassemblies as well the assembly of the final product. Ecoinvent data used for modelling is from 2022 and Industrial data is from 2023.

Database(s) and LCA software used: Ecoinvent 3.8, Industrial data 2.0, and SimaPro LCA software (version 9.4.0.2).

### Description of system boundaries:

The system boundary of the life cycle assessment was set to cradle to grave and module D since the product has operational energy usage based on the EN 15804 standard. The assessment covers the product stage (A1-A3), the construction process stage (A4-A5), the use stage (B) the end-of-life stage (C1-C4) and benefits and loads beyond the system boundary (D).

The product consists of different components that are produced by different subcontractors. The main components of the product are aluminium based casted body, adapter consisting of electronic components and housing and luminaire.

The manufacturing processes of subcontractors are included in module A1. The aluminium body is manufactured by Foshan City Sunrise Lighting Technology Co., Ltd. in China. Signify N.V produces the PCB and luminaire of the product. Mass of the PCB is 0,045 kg and most of it is related to the electronics of the PCB. As there was limited amount of information available regarding the electronics components a generic dataset for printed wiring board (PWB) was used instead. Luminaire is very light component weighing only ~0,001 kg. Luminaire was modelled based on material content information provided by Signify N.V. and it consists mostly of metal core printed circuit board (MCPCB) substrate. This consists mainly of aluminum. The luminaire also includes Gallium Nitride chip, phosphor, silicon, and gold. Eino Korhonen Oy (EKOY) is responsible for assembling the adapter for the product. This includes PCBa and housing. The PCBa is delivered from Signify to EKOY. The housing consists mostly of PCB, but also includes PA, brass and steel to smaller degrees.

Module A2 includes the transportation of product parts from subcontractors to taking place in Hiiumaa, Estonia.

Module A3 includes the assembly process by Liisbet Tukat OÜ (Lival's subcontractor). The assembly process itself is very simple and only covers electricity consumption, production of final packaging materials and treatment of packaging waste. Electricity source in module A3 is modelled as residual mix of Estonia for year 2021, since no information were available of the production mix or the residual mix for 2022. According to Elering the Estonian residual electricity production mix included: fossil energy sources 76,37 %, renewable energy sources 7,55 % and nuclear power 16,08 % (Elering 2022). This information was further combined with statistics provided by Statista to consider the different energy sources within fossil and renewable categories. The residual electricity of Estonia in 2021 consists of: 75,80 % oil, 0,56 % natural gas, 3,94 % biomass, 1,21 % solar power, 2,5 % wind power and 16,08 % nuclear power (Statista 2023). Estonia does not have its own nuclear power production so the nuclear power within the residual electricity mix was assumed to imported from Finland. Global warming potential of the residual electricity mix is 636,58 g CO<sub>2</sub>-eq/kWh.

Module A4 includes the product transportation to Frankfurt where they are delivered further to customers. Since the exact transportation distances are not known the assumed distance used in the modelling is 1 500 km.

Module A5 includes the installation of the product. Since the installation is assumed done by hand it does not cause environmental impacts. However packaging material of the final products are disposed in this life cycle stage, so recycling of cardboard and plastic is considered here.

Module B6 includes the operational energy usage of the product. As the functional unit is lighting for one year with 26 W a lighting product and the product is used approximately 3 000 h per year for lighting purpose. The electricity consumption scenario is 78 kWh in a year. Geographical scope of the use stage is Europe, which is one of the main markets for Lival's products. Average European low voltage

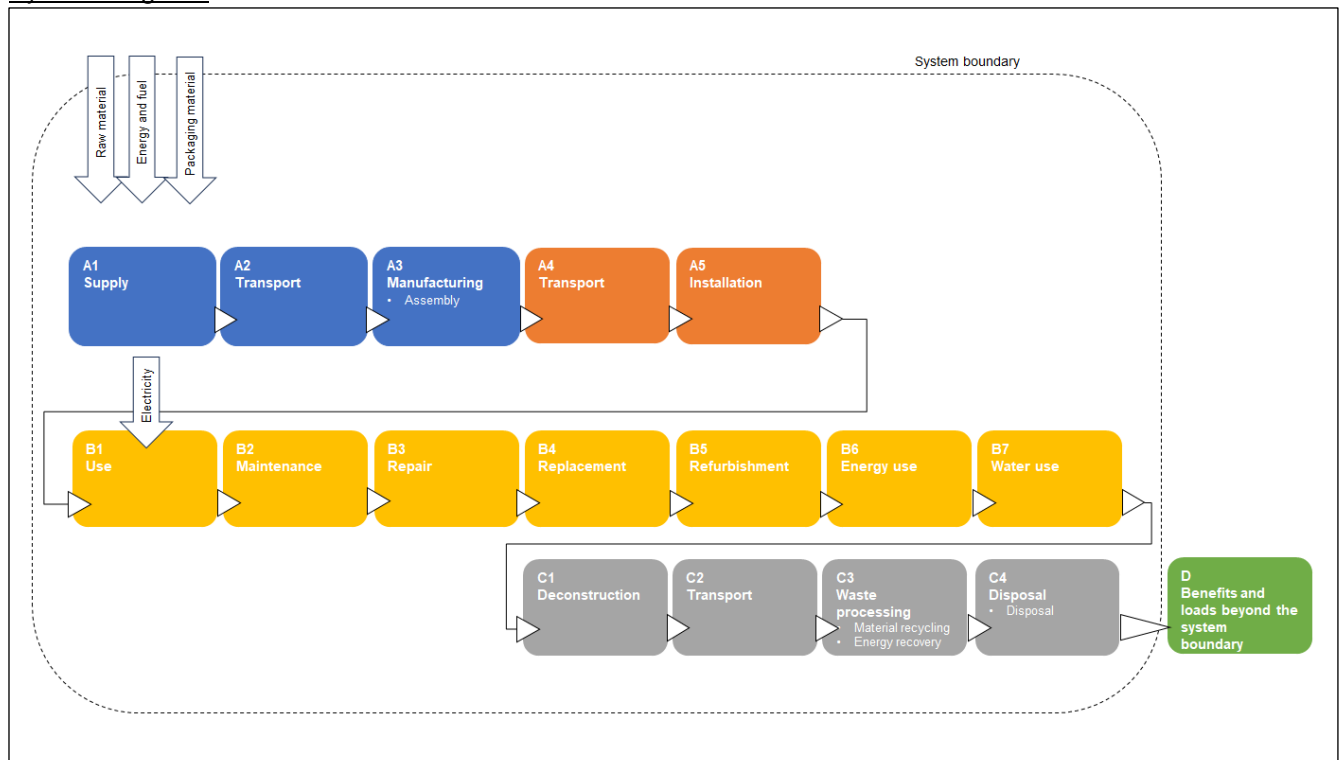
electricity grid mix was used while modelling the electricity production related to the use stage of the product. The dataset was selected from ecoinvent 3.9.1 database. The GWP-GHG impact of the electricity mix is 369 g CO<sub>2</sub>-eq/kWh.

Module C1 includes the demolition of the product. It is assumed being done by hand, so it does not cause any environmental impacts.

Module C2 includes the transportation of the discarded product. In this scenario is assumed that the distance from de-construction to waste processing is estimated to be 50 km by road.

Module C3 includes the waste processing and module C4 the disposal. It was assumed that 79 % of the product sold to market are headed to recovery whereas the rest are headed to disposal through landfilling. Metal components were assumed to be headed to material recycling through remelting and casting. Plastic components were assumed to be headed for incineration. PCB is expected to be shredded allowing precious metals to be separated and collected.

**System diagram:**



**More information:**

LCA practitioner: Ecobio Oy, [info@ecobio.fi](mailto:info@ecobio.fi). Explanatory material can be obtained from the EPD owner and/or LCA practitioner.

Data quality: The quality requirements for the life cycle assessment were set according to the EN ISO 14044 and the EN 15804 standards.

Cut-off rule: Cut-off criteria was no applied for the LCA.

Allocation: Co-product allocation was applied for the aluminum cast body of the GA Standard Led Spot Track Light. Economic co-product allocation based on the hierarchy presented for co-product allocation on the EN 15804:2012+A2:2019.

Modules declared, geographical scope, share of specific data (in GWP-GHG indicator) and data variation:

	Product stage		Construction process stage			Use stage							End of life stage				Resource recovery stage		
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential		
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
Modules declared	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Geography	GLO, EU27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27		
Specific data	< 10 %					-	-	-	-	-	-	-	-	-	-	-	-	-	
Variation – products	0 %					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%					-	-	-	-	-	-	-	-	-	-	-	-	-	-

## Content information

Product components		Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Aluminium cast body	Aluminium	0,320	0 %	0 %
	<b>Sub-assembly total</b>	<b>0,320</b>	<b>0 %</b>	<b>0 %</b>
Adapter assembled	Brass	0,007	0 %	0 %
	Polyamide	0,008	0 %	0 %
	Polycarbonate	0,047	0 %	0 %
	Steel	0,001	0 %	0 %
	Printed circuit board	0,045	0 %	0 %
	<b>Sub-assembly total</b>	<b>0,108</b>	<b>0 %</b>	<b>0 %</b>
Luminaire	MCPCB substrate (mostly aluminium)	0,001	0 %	0 %
	Chip (consisting of Gallium Nitride)	6,00E-05	0 %	0 %
	Phosphor	5,00E-05	0 %	0 %
	Silicon	2,00E-04	0 %	0 %
	Gold	4,00E-06	0 %	0 %
	<b>Sub-assembly total</b>	<b>0,001</b>	<b>0 %</b>	<b>0 %</b>
<b>TOTAL</b>		<b>0,429</b>	<b>0 %</b>	<b>0 %</b>
<b>Packaging materials</b>		<b>Weight, kg</b>	<b>Weight-% (versus the product)</b>	
Corrugated board box		0,014	3,2 %	
Packaging film, low density polyethylene		0,004	0,9 %	
Wood pallet		0,015	3,5 %	
<b>TOTAL</b>		<b>0,033</b>	<b>7,7 %</b>	



## Environmental Information

### Potential environmental impact – mandatory indicators according to EN 15804

Indicator	Unit	A1-A3**	A4**	A5**	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-fossil	kg CO <sub>2</sub> eq.	<b>1,16E+00</b>	1,24E-02	1,19E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,85E+01	0,00E+00	0,00E+00	5,69E-04	1,34E-02	3,82E-04	-2,36E-01
GWP-biogenic	kg CO <sub>2</sub> eq.	<b>-2,06E-01</b>	5,06E-06	2,15E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,95E-01	0,00E+00	0,00E+00	2,40E-07	4,44E-07	5,48E-07	-1,14E-03
GWP-luluc	kg CO <sub>2</sub> eq.	<b>1,12E-03</b>	5,93E-06	4,60E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,01E-02	0,00E+00	0,00E+00	2,56E-07	2,76E-07	3,84E-08	-4,37E-03
GWP-total	kg CO <sub>2</sub> eq.	<b>9,51E-01</b>	1,24E-02	2,16E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,88E+01	0,00E+00	0,00E+00	5,70E-04	1,34E-02	3,82E-04	-2,41E-01
ODP	kg CFC 11 eq.	<b>1,66E-08</b>	2,64E-10	1,53E-11	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,33E-07	0,00E+00	0,00E+00	1,21E-11	2,32E-11	3,01E-12	-4,74E-09
AP	mol H <sup>+</sup> eq.	<b>7,88E-03</b>	3,95E-05	5,03E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,61E-01	0,00E+00	0,00E+00	1,73E-06	3,70E-06	7,84E-07	-1,92E-03
EP-freshwater	kg P eq.	<b>4,85E-04</b>	8,48E-07	1,40E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,66E-02	0,00E+00	0,00E+00	3,83E-08	1,76E-07	6,14E-08	-1,19E-04
EP-freshwater	kg PO <sub>4</sub> <sup>3-</sup> eq.	<b>1,40E-03</b>	1,36E-05	2,14E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,60E-02	0,00E+00	0,00E+00	5,92E-07	2,16E-06	5,22E-06	-2,39E-04
EP-marine	kg N eq.	<b>1,44E-02</b>	1,43E-04	2,00E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,35E-01	0,00E+00	0,00E+00	6,24E-06	1,76E-05	3,50E-06	-2,40E-03
EP-terrestrial	mol N eq.	<b>4,29E-03</b>	5,90E-05	7,43E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,55E-02	0,00E+00	0,00E+00	2,59E-06	5,16E-06	1,29E-06	-8,94E-04
POCP	kg NMVOC eq.	<b>5,92E-05</b>	3,89E-08	4,57E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,35E-04	0,00E+00	0,00E+00	1,77E-09	6,26E-10	4,66E-10	-1,18E-06
ADP-minerals&metals*	kg Sb eq.	<b>1,13E+01</b>	1,72E-01	1,25E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,35E+02	0,00E+00	0,00E+00	7,80E-03	2,57E-03	2,41E-03	-2,84E+00
ADP-fossil*	MJ	<b>9,99E-02</b>	7,10E-04	8,87E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,25E+00	0,00E+00	0,00E+00	3,00E-05	6,91E-05	2,19E-05	-3,83E-02
WDP	m <sup>3</sup>	<b>1,16E+00</b>	1,24E-02	1,19E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,85E+01	0,00E+00	0,00E+00	5,69E-04	1,34E-02	3,82E-04	-2,36E-01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption.															

\*Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

\*\*Disclaimer: The results of modules A1-A5 shall not be used without considering the results of module C1-C4.

## Potential environmental impact – additional mandatory and voluntary indicators

Indicator	Unit	A1-A3 <sup>3</sup>	A4 <sup>3</sup>	A5 <sup>3</sup>	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG <sup>1</sup>	kg CO <sub>2</sub> eq.	<b>1,17E+00</b>	1,25E-02	1,35E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,88E+01	0,00E+00	0,00E+00	5,70E-04	1,34E-02	3,82E-04	- 2,41E-01
Respiratory inorganics <sup>2</sup>	disease inc.	<b>9,10E-08</b>	9,64E-10	1,06E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,87E-07	0,00E+00	0,00E+00	3,79E-11	3,11E-09	1,76E-11	- 1,87E-08
Ionizing radiation HH <sup>2</sup>	kBq U235 eq	<b>4,16E-02</b>	2,30E-04	4,55E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,77E+01	0,00E+00	0,00E+00	1,26E-05	2,07E-05	1,84E-05	- 2,89E-02
Freshwater ecotoxicity <sup>2</sup>	CTUe	<b>6,50E+00</b>	7,32E-02	5,71E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,48E+01	0,00E+00	0,00E+00	3,42E-03	7,32E-02	1,07E-02	- 1,53E-01
Human toxicity, cancer effects <sup>2</sup>	CTUh	<b>4,23E-10</b>	2,91E-12	5,02E-13	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,00E-09	0,00E+00	0,00E+00	1,18E-13	5,32E-11	1,47E-13	- 2,96E-10
Human toxicity, non-cancer effects <sup>2</sup>	CTUh	<b>1,13E-08</b>	4,99E-11	7,16E-12	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,16E-07	0,00E+00	0,00E+00	2,15E-12	1,52E-11	2,28E-12	- 3,12E-09
Land use <sup>2</sup>	Pt	<b>4,04E+00</b>	1,02E-01	5,06E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,24E+02	0,00E+00	0,00E+00	4,00E-03	6,84E-04	5,00E-03	- 2,31E-01

<sup>1</sup> This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO<sub>2</sub> is set to zero.

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

<sup>3</sup> The results of modules A1-A5 shall not be used without considering the results of module C1-C4.

## Use of resources

Indicator	Unit	A1-A3*	A4*	A5*	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	<b>1,02E+00</b>	2,66E-03	4,62E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,39E+02	0,00E+00	0,00E+00	1,36E-04	2,44E-04	3,86E-04	- 1,08E+00
PERM	MJ	<b>6,04E-01</b>	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	<b>1,62E+00</b>	2,66E-03	4,62E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,39E+02	0,00E+00	0,00E+00	1,36E-04	2,44E-04	3,86E-04	- 1,08E+00
PENRE	MJ	<b>1,13E+01</b>	1,72E-01	1,25E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,34E+02	0,00E+00	0,00E+00	7,80E-03	2,57E-03	2,41E-03	- 2,84E+00
PENRM	MJ.	<b>1,45E-01</b>	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-1,15E-01	0,00E+00	0,00E+00
PENRT	MJ	<b>1,15E+01</b>	1,72E-01	1,25E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,34E+02	0,00E+00	0,00E+00	7,80E-03	-1,12E-01	2,41E-03	- 2,84E+00
SM	kg	<b>0,00E+00</b>	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	<b>0,00E+00</b>	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	<b>0,00E+00</b>	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m <sup>3</sup>	<b>4,14E-03</b>	2,45E-05	3,23E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,02E-01	0,00E+00	0,00E+00	1,13E-06	3,94E-06	3,22E-06	-5,56E-03
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water															

\*Disclaimer: The results of modules A1-A5 shall not be used without considering the results of module C1-C4.

## Waste production and output flows

### Waste production

Indicator	Unit	A1-A3*	A4*	A5*	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	<b>4,92E-05</b>	1,09E-06	7,31E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,12E-03	0,00E+00	0,00E+00	4,96E-08	2,50E-08	1,07E-08	2,45E-05
Non-hazardous waste disposed	kg	<b>1,72E-01</b>	8,39E-03	4,16E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,54E+00	0,00E+00	0,00E+00	3,22E-04	1,94E-04	7,77E-03	-6,69E-02
Radioactive waste disposed	kg	<b>9,39E-06</b>	5,58E-08	1,15E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,55E-03	0,00E+00	0,00E+00	3,09E-09	5,12E-09	4,13E-09	-7,48E-06

\*Disclaimer: The results of modules A1-A5 shall not be used without considering the results of module C1-C4.

### Output flows

Indicator	Unit	A1-A3*	A4*	A5*	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	7,06E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,88E-01	0,00E+00	0,00E+00
Materials for energy recovery	kg	9,33E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,52E-03	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

\*Disclaimer: The results of modules A1-A5 shall not be used without considering the results of module C1-C4.

### Information on biogenic carbon content

Results per functional or declared unit		
BIOGENIC CARBON CONTENT	Unit	QUANTITY
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	0,45

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO<sub>2</sub>.

## Additional information

In addition, At Lival, environmental issues are an integral part of business activities. Lival considers it a matter of conscience to search for solutions that enable a balance between economic growth and minimal ecological impact, e.g., Life Cycle thinking, material and energy efficiency as well as least possible waste and emissions. Lival is certified to ISO 14001.

Lival's aim is to be carbon neutral by year 2030.

## Additional social and economic information

Lival has for more than 20 years applied the SA 8000 standard as a framework for responsible practices.

Legal compliance: Lival complies with national and international laws and regulations in the countries in which we operate. Lival respects international norms of behaviour and is guided by international treaties and recommendations such as the UN's Universal Declaration of Human Rights and Convention on the Rights of the Child, the ILO's Declaration on Fundamental Principles and Rights at Work.

Health and safety: At Lival health and safety issues are high priority. Our aim is zero accidents and a wellbeing and healthy staff in a safe working environment. Lival is certified to OHSAS 18001.

Working hours: Lival complies with applicable laws and industry standards including criteria laid out in the SA 8000 standard on working hours and public holidays.

## Information related to Sector EPD

Does not apply to this case.

## Differences versus previous versions

Does not apply to this case as there are no previous versions.

## References

General Programme Instructions of the International EPD® System. Version 4.0.

PCR 2019:14. Construction products. Version 1.2.5.

Ecobio LCA report - Lival Oy Ab's Basic and Highlight Range Light Products. 2023.

