ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

MileWide LED gen2 small BRP435/BPP435

Signify N.V.

EPD HUB, HUB-4474

Published on 05.01.2026, last updated on 05.01.2026, valid until 05.01.2031

MANUFACTURER AND SITE

Manufacturer	Signify N.V.
Address	High Tech Campus 48, 5656 AE Eindhoven, The Netherlands
Contact details	sustainability@signify.com
Website	https://www.signify.com/global
Place of production	KETRZYN, POLAND
Place(s) of raw material origin	APAC, EU
Place(s) of installation and use	EU
Period for data	Calendar Year 2023

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
Scope of the EPD	Cradle to gate with options, A4-A5, B6, and modules C1-C4, D
EPD author	Signify / Sustainability
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Haiha Nguyen as an authorized verifier for EPD Hub

PRODUCT SPECIFICATION

Product name	MileWide LED gen2 small BRP435/BPP435
Product number / reference	910770236458 / BRP435 LED100-/830 II DM11 7023 MSP D9 S
GTIN (Global Trade Item Number)	Not applicable
NOBB (Norwegian Building Product Database)	Not applicable
A1-A3 Specific data (%)	5.52

PRODUCT DESCRIPTION

MileWide LED Gen2, developed together with Holscher Design, is the latest generation of our highly popular MileWide lighting family that features a range of dedicated masts and brackets. The pure, clean design of MileWide LED Gen2 integrates perfectly with the cityscapes of today and tomorrow. Available in two sizes, BPP435 (small) and BPP436 (large), this MileWide pole light will bring a touch of elegance and fluidity to any urban application (side entry versions: BRP435 and BRP436). Thanks to its advanced LED engine, and use of application-tailored optics, MileWide LED Gen2 delivers outstanding quality of light and light performance, enabling significant energy savings, yet still providing perfectly uniform light on the road. The luminaire is available with one or two Zhaga-D4i (ZD4i) System Ready (SR) sockets, which makes the luminaire future ready. This means MileWide LED Gen2 is ready to pair with advanced controls and lighting software applications such as Interact, or sensors such as the Outdoor Sensor Bundle (OSB). Furthermore, each MileWide LED Gen2 luminaire is uniquely identifiable, thanks to the Signify Service tag app. By simply scanning a QR code, placed inside the door of the mast or directly on the luminaire, you can instantly access the configuration of the luminaire. This makes maintenance and programing operations faster and easier, and enables you to create a digital library of lighting assets and spare parts.

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.

PRODUCT CLASSIFICATION

Declared operating voltage, Volt	220-240
Light source colour temperature, Kelvin	3000
Protection index for water and dust (IP)	66
Impact resistance index (IK)	8
Luminous flux, Lumens	8499
Electrical power, Watt	67.5
Luminous efficiency, Lm/W	126
Additional characteristic	Not applicable

ABOUT THE MANUFACTURER

Signify is the world leader in lighting for professionals, consumers and lighting for the Internet of Things. Our energy efficient lighting products, systems and services enable our customers to enjoy a superior quality of light, and make people's lives safer and more comfortable, businesses more productive and cities more liveable.

For more information, please visit: https://www.signify.com/global

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	52.67	APAC , EU
Minerals	16.87	APAC , EU
Fossil materials	30.46	APAC , EU
Bio-based materials	0	EU

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	0.279

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 unit
Declared unit mass, kg	8.443
Mass of packaging, kg	0.716
Functional unit (from PEP PSR0014)	Provide lighting that delivers an outgoing artificial luminous flux of 1000 lumens during a reference lifetime of 35000 hours
Reference service life (years)	25
Assigned lifetime (hours)	100000
GWP-total, A1-A3 (kg CO_2e)	61
GWP-fossil, A1-A3 (kg CO_2e)	61.6
Secondary material, inputs (%)	27.8
Secondary material, outputs (%)	42.8
Total energy use, A1-A3 (kWh)	247
Net freshwater use, A1-A3 (m^3)	1.08E+00

LIFE CYCLE ASSESSMENT

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Product stage			Installation stage		Use stage							End of life stage				Beyond the system
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	Installation	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

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, ancillary materials, energy & water consumption, material loss and waste generation at the manufacturing site are attributed to the bill of materials of the products, therefore, they are allocated by partitioning the quantities on the base of the total production in kg throughout the year. Thus, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging materials	No allocation
Ancillary materials	Allocated by mass
Manufacturing energy and waste	Allocated by mass

Proxy data is used for certain materials due to their unavailability in the database. Conservative choices have been adopted when exact information was missing. Regarding module C1-C4: EOL scenarios are based on default values from EN 50693. For stages description please refer to section Product life cycle in this EPD report.

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 v 3.10.1 and One Click LCA databases were used as sources of environmental data. Allocation used in Ecoinvent 3.10.1 environmental data sources follow the methodology 'allocation, cut-off, EN 15804+A2'.

No other sources were used in the modelling of this EPD.

PRODUCT & MANUFACTURING SITES GROUPING

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

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

MANUFACTURING AND PACKAGING (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 waste handling practices in the factory, while scenario assumptions are made in the absence of exact data. The study also considers the fuels used by machines as well as losses during electricity transmission.

The product is made of metals, plastics, and electronic components. All components are transported to the production facility, where the main manufacturing processes primarily are associated with assembly. A2 transport distances are calculated always taking the capital city of component country of origin as a starting point and exact manufacturing location as destination. The finished product can be packaged with polyethylene, cardboard, and/or paper as packaging material before shipment to customers. Manufacturing loss, ancillaries and wastes are calculated according to the data that each manufacturing site is sharing with Signify. The total annual amount of waste in kg is allocated to the total annual production in kg at the specific manufacturing site responsible to produce the studied product. Thus, it is possible to allocate it according to the weight of the product analysed in this study.

Co-product allocation is neglected as revenue of co-product is very low, hence, the waste undergoes a conservative waste treatment.
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)

A4 transport distances are calculated always taking the exact manufacturing location to customer location. If the customer's location is defined as a country or its capital city, the calculation is made to the respective capital city. If the customer's location is specified as a region, the distance is calculated to the capital city of the best-performing sales country within that region. The transportation method is a combination of lorry and container ship where needed. To be conservative, empty returns are included in this study as implemented through an average load factor in the Ecoinvent transport datapoints. Environmental impacts from installation include waste packaging materials (A5). The packaging waste treatment is assumed to be conservative with incineration without energy recovery. The impacts of energy consumption and the used ancillary materials during installation are considered negligible.

PRODUCT USE AND MAINTENANCE (B1-B7)

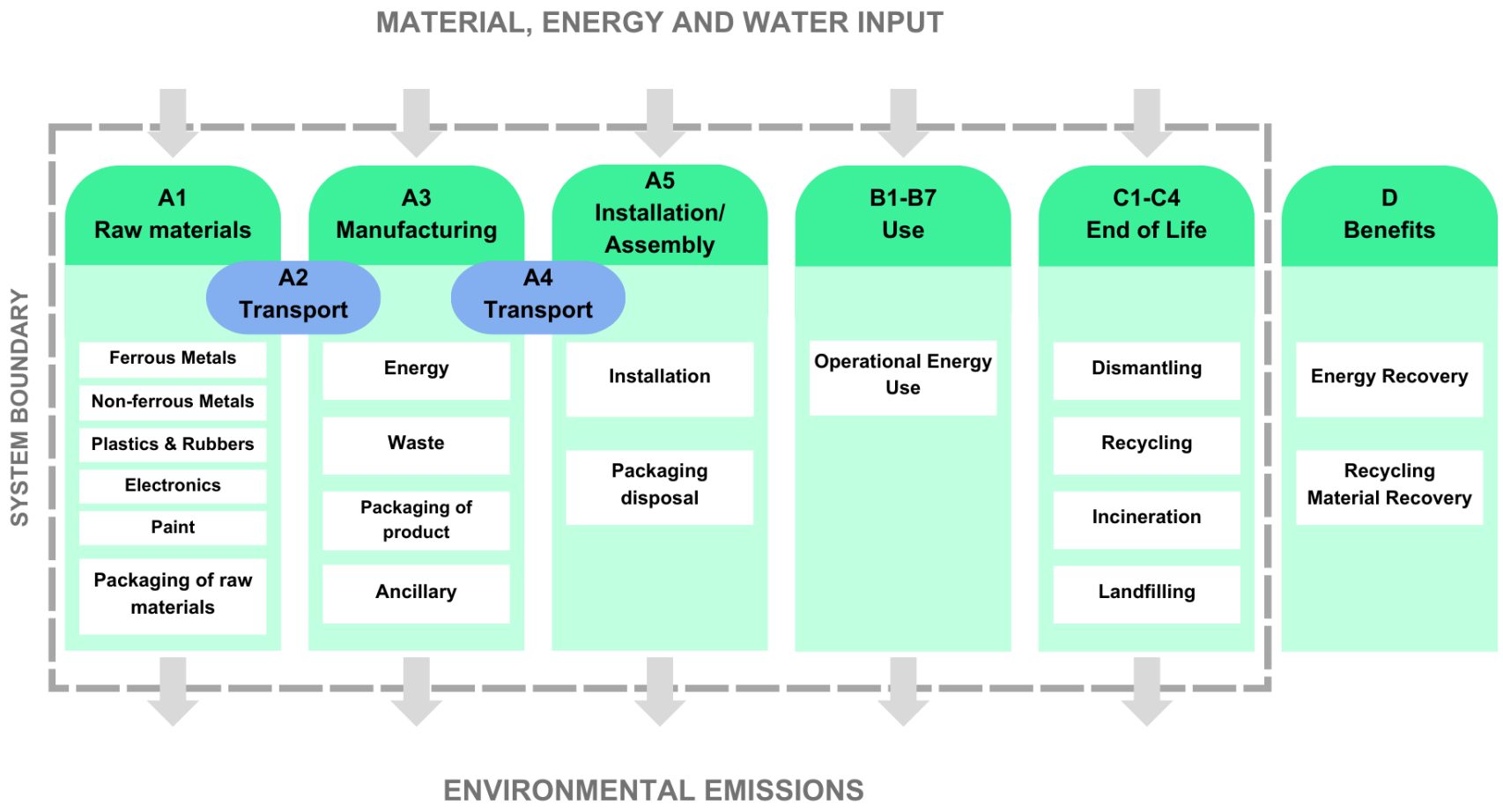
During the use phase, the product consumes electricity (B6), which is calculated multiplying the Wattage x Assigned lifetime (hours) x Country energy mix factor. To know which Country energy mix was used in this EPD, please refer to Annex 2.

The Reference service life in years is calculated according to the main application type of the product, based on annual operating hours. 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.

LIFE CYCLE FLOW DIAGRAM - SYSTEM BOUNDARY



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_2e	5.78E+01	1.42E+00	1.77E+00	6.10E+01	3.00E-01	1.09E+00	ND	ND	ND	ND	ND	2.22E+03	ND	0.00E+00	2.47E-01	2.87E+00	1.23E+00	-7.51E+00
GWP – fossil	kg CO_2e	5.82E+01	1.42E+00	1.93E+00	6.16E+01	2.99E-01	7.07E-02	ND	ND	ND	ND	ND	2.21E+03	ND	0.00E+00	2.47E-01	2.87E+00	1.52E+00	-7.48E+00
GWP – biogenic	kg CO_2e	-5.22E-01	3.05E-04	-1.86E-01	-7.08E-01	6.78E-05	1.02E+00	ND	ND	ND	ND	ND	4.95E+00	ND	0.00E+00	5.39E-05	-4.30E-04	-2.92E-01	-1.39E-02
GWP – LULUC	kg CO_2e	9.11E-02	6.56E-04	2.32E-02	1.15E-01	1.34E-04	1.66E-05	ND	ND	ND	ND	ND	6.78E+00	ND	0.00E+00	1.09E-04	1.43E-04	8.98E-05	-1.38E-02
Ozone depletion pot.	kg CFC_{-11}e	7.04E-07	2.08E-08	5.98E-08	7.84E-07	4.42E-09	6.21E-10	ND	ND	ND	ND	ND	4.07E-05	ND	0.00E+00	3.45E-09	2.00E-09	1.65E-09	-5.38E-08
Acidification potential	mol H^+e	8.09E-01	1.08E-02	5.96E-03	8.26E-01	1.02E-03	2.70E-04	ND	ND	ND	ND	ND	1.30E+01	ND	0.00E+00	8.23E-04	1.54E-03	7.21E-04	-4.09E-01
EP-freshwater[2)]	kg Pe	4.29E-02	9.97E-05	4.84E-04	4.35E-02	2.33E-05	4.54E-06	ND	ND	ND	ND	ND	2.06E+00	ND	0.00E+00	1.92E-05	5.64E-05	5.60E-05	-2.28E-02
EP-marine	kg Ne	7.50E-02	3.01E-03	2.73E-03	8.07E-02	3.35E-04	1.26E-04	ND	ND	ND	ND	ND	2.04E+00	ND	0.00E+00	2.67E-04	5.63E-04	2.39E-03	-1.86E-02
EP-terrestrial	mol Ne	8.39E-01	3.31E-02	1.77E-02	8.90E-01	3.65E-03	1.15E-03	ND	ND	ND	ND	ND	1.83E+01	ND	0.00E+00	2.90E-03	5.34E-03	3.11E-03	-2.52E-01
POCP ("smog")[3)]	kg NMVOCe	2.90E-01	1.10E-02	6.61E-03	3.08E-01	1.51E-03	3.27E-04	ND	ND	ND	ND	ND	6.01E+00	ND	0.00E+00	1.15E-03	1.44E-03	1.00E-03	-7.51E-02
ADP-minerals & metals[4)]	kg Sbe	8.67E-03	3.54E-06	5.24E-06	8.67E-03	8.35E-07	1.34E-07	ND	ND	ND	ND	ND	2.98E-02	ND	0.00E+00	8.11E-07	4.83E-06	2.47E-07	-6.21E-03
ADP-fossil resources	MJ	7.77E+02	2.01E+01	2.29E+01	8.20E+02	4.35E+00	4.66E-01	ND	ND	ND	ND	ND	5.14E+04	ND	0.00E+00	3.47E+00	1.64E+00	1.29E+00	-9.10E+01
Water use[5)]	m^3e depr.	4.79E+01	9.30E-02	4.66E-01	4.84E+01	2.15E-02	5.46E-02	ND	ND	ND	ND	ND	1.40E+03	ND	0.00E+00	1.61E-02	2.00E-01	1.03E-01	-3.36E+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	4.82E-06	1.26E-07	1.03E-07	5.05E-06	3.00E-08	3.33E-09	ND	ND	ND	ND	ND	4.63E-05	ND	0.00E+00	1.96E-08	1.58E-08	9.73E-09	-9.43E-07
Ionizing radiation[6)]	kBq U235e	4.26E+00	1.63E-02	5.82E-02	4.33E+00	3.78E-03	5.66E-04	ND	ND	ND	ND	ND	1.42E+03	ND	0.00E+00	2.80E-03	5.41E-03	2.01E-03	-8.26E-01
Ecotoxicity (freshwater)	CTUe	7.15E+02	2.65E+00	7.34E+00	7.25E+02	6.15E-01	1.32E+00	ND	ND	ND	ND	ND	7.83E+03	ND	0.00E+00	5.48E-01	6.06E+00	9.25E+01	-3.53E+02
Human toxicity, cancer	CTUh	8.56E-08	2.45E-10	7.08E-10	8.66E-08	4.94E-11	6.32E-11	ND	ND	ND	ND	ND	7.47E-07	ND	0.00E+00	4.20E-11	3.03E-10	2.50E-10	-5.38E-08
Human tox. non-cancer	CTUh	6.15E-06	1.19E-08	1.90E-08	6.18E-06	2.81E-09	2.57E-09	ND	ND	ND	ND	ND	3.87E-05	ND	0.00E+00	2.17E-09	1.26E-08	1.36E-08	-5.56E-06
SQP[7)]	-	4.36E+02	1.76E+01	5.50E+01	5.09E+02	4.38E+00	2.28E-01	ND	ND	ND	ND	ND	1.14E+04	ND	0.00E+00	2.07E+00	2.01E+00	1.82E+00	-1.48E+02

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	1.54E+02	2.58E-01	1.07E-02	1.54E+02	5.96E-02	-1.25E+01	ND	ND	ND	ND	ND	1.41E+04	ND	0.00E+00	4.75E-02	1.81E-01	-5.39E+00	-1.69E+01
Renew. PER as material	MJ	7.84E+00	0.00E+00	1.19E+00	9.03E+00	0.00E+00	-9.00E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	-1.25E-02	-1.94E-02	0.00E+00
Total use of renew. PER	MJ	1.62E+02	2.58E-01	1.20E+00	1.63E+02	5.96E-02	-2.15E+01	ND	ND	ND	ND	ND	1.41E+04	ND	0.00E+00	4.75E-02	1.69E-01	-5.41E+00	-1.69E+01
Non-re. PER as energy	MJ	6.99E+02	2.01E+01	1.57E+01	7.35E+02	4.35E+00	6.66E-02	ND	ND	ND	ND	ND	5.14E+04	ND	0.00E+00	3.47E+00	-4.09E+01	-4.54E+01	-9.10E+01
Non-re. PER as material	MJ	7.72E+01	0.00E+00	-6.08E+00	7.11E+01	0.00E+00	-5.41E-01	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	-3.25E+01	-3.81E+01	0.00E+00
Total use of non-re. PER	MJ	7.76E+02	2.01E+01	9.64E+00	8.06E+02	4.35E+00	-4.75E-01	ND	ND	ND	ND	ND	5.14E+04	ND	0.00E+00	3.47E+00	-7.33E+01	-8.35E+01	-9.10E+01
Secondary materials	kg	2.34E+00	0.00E+00	0.00E+00	2.34E+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
Renew. secondary fuels	MJ	1.86E-01	9.62E-05	7.72E-02	2.63E-01	2.35E-05	5.86E-06	ND	ND	ND	ND	ND	6.79E-02	ND	0.00E+00	1.98E-05	6.85E-05	2.09E-05	-1.70E-03
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	1.07E+00	2.74E-03	1.01E-02	1.08E+00	6.42E-04	8.87E-04	ND	ND	ND	ND	ND	4.44E+01	ND	0.00E+00	4.59E-04	3.25E-03	-5.24E-03	-1.68E-01

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	9.85E+00	3.29E-02	8.86E-02	9.97E+00	7.36E-03	1.44E-02	ND	ND	ND	ND	ND	1.30E+02	ND	0.00E+00	6.04E-03	5.59E-02	2.37E-01	-2.07E+00
Non-hazardous waste	kg	3.41E+02	5.91E-01	5.36E+00	3.47E+02	1.36E-01	7.66E-01	ND	ND	ND	ND	ND	1.01E+04	ND	0.00E+00	1.13E-01	1.98E+00	1.24E+01	-1.44E+02
Radioactive waste	kg	1.14E-03	3.98E-06	1.38E-05	1.16E-03	9.27E-07	1.42E-07	ND	ND	ND	ND	ND	3.65E-01	ND	0.00E+00	6.87E-07	1.34E-06	4.96E-07	-2.08E-04

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	7.16E-02	7.16E-02	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	3.61E+00	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	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	1.33E+01	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	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	5.61E+00	0.00E+00	0.00E+00
Exported energy – Heat	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	7.71E+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	5.82E+01	1.41E+00	2.03E+00	6.16E+01	2.98E-01	7.03E-02	ND	ND	ND	ND	ND	2.21E+03	ND	0.00E+00	2.46E-01	2.87E+00	1.82E+00	-7.46E+00
Ozone depletion Pot.	kg CFC_{-11}e	6.43E-07	1.66E-08	5.58E-08	7.16E-07	3.53E-09	5.28E-10	ND	ND	ND	ND	ND	3.40E-05	ND	0.00E+00	2.76E-09	1.72E-09	1.37E-09	-4.56E-08
Acidification	kg SO_2e	7.00E-01	8.48E-03	4.15E-03	7.13E-01	7.80E-04	1.98E-04	ND	ND	ND	ND	ND	1.11E+01	ND	0.00E+00	6.31E-04	1.18E-03	5.24E-04	-3.62E-01
Eutrophication	kg PO_4^3e	1.13E-01	1.35E-03	3.13E-03	1.17E-01	1.90E-04	6.16E-05	ND	ND	ND	ND	ND	1.43E+00	ND	0.00E+00	1.53E-04	2.67E-04	7.43E-04	-1.47E-02
POCP (“smog”)	kg C_2H_4e	3.94E-02	5.43E-04	4.84E-04	4.04E-02	6.95E-05	1.50E-05	ND	ND	ND	ND	ND	6.03E-01	ND	0.00E+00	5.65E-05	7.29E-05	1.15E-04	-1.51E-02
ADP-elements	kg Sbe	8.65E-03	3.45E-06	5.10E-06	8.66E-03	8.15E-07	1.12E-07	ND	ND	ND	ND	ND	2.97E-02	ND	0.00E+00	7.92E-07	4.76E-06	2.10E-07	-6.20E-03
ADP-fossil	MJ	7.07E+02	1.98E+01	2.20E+01	7.49E+02	4.29E+00	4.57E-01	ND	ND	ND	ND	ND	2.64E+04	ND	0.00E+00	3.42E+00	1.56E+00	1.26E+00	-7.82E+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 CO2e	5.83E+01	1.42E+00	1.96E+00	6.17E+01	3.00E-01	7.07E-02	ND	ND	ND	ND	ND	2.22E+03	ND	0.00E+00	2.47E-01	2.87E+00	1.52E+00	-7.49E+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

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	2.38E+00	5.84E-02	7.29E-02	2.51E+00	1.23E-02	4.49E-02	ND	ND	ND	ND	ND	9.15E+01	ND	0.00E+00	1.02E-02	1.18E-01	5.06E-02	-3.09E-01
GWP – fossil	kg CO_2 éq/FU	2.40E+00	5.84E-02	7.96E-02	2.54E+00	1.23E-02	2.91E-03	ND	ND	ND	ND	ND	9.10E+01	ND	0.00E+00	1.02E-02	1.18E-01	6.26E-02	-3.08E-01
GWP – biogenic	kg CO_2 éq/FU	-2.15E-02	1.26E-05	-7.67E-03	-2.91E-02	2.79E-06	4.20E-02	ND	ND	ND	ND	ND	2.04E-01	ND	0.00E+00	2.22E-06	-1.77E-05	-1.20E-02	-5.71E-04
GWP – LULUC	kg CO_2 éq/FU	3.75E-03	2.70E-05	9.55E-04	4.73E-03	5.52E-06	6.85E-07	ND	ND	ND	ND	ND	2.79E-01	ND	0.00E+00	4.50E-06	5.89E-06	3.70E-06	-5.68E-04
Ozone depletion pot.	kg CFC_{11}e/FU	2.90E-08	8.58E-10	2.46E-09	3.23E-08	1.82E-10	2.56E-11	ND	ND	ND	ND	ND	1.68E-06	ND	0.00E+00	1.42E-10	8.24E-11	6.79E-11	-2.21E-09
Acidification potential	mole H^+e/FU	3.33E-02	4.45E-04	2.45E-04	3.40E-02	4.20E-05	1.11E-05	ND	ND	ND	ND	ND	5.35E-01	ND	0.00E+00	3.39E-05	6.33E-05	2.97E-05	-1.69E-02
EP-freshwater[2)]	kg Pe/FU	1.77E-03	4.11E-06	1.99E-05	1.79E-03	9.60E-07	1.87E-07	ND	ND	ND	ND	ND	8.47E-02	ND	0.00E+00	7.91E-07	2.32E-06	2.31E-06	-9.38E-04
EP-marine	kg Ne/FU	3.09E-03	1.24E-04	1.12E-04	3.32E-03	1.38E-05	5.20E-06	ND	ND	ND	ND	ND	8.39E-02	ND	0.00E+00	1.10E-05	2.32E-05	9.83E-05	-7.66E-04
EP-terrestrial	mol Ne/FU	3.46E-02	1.36E-03	7.29E-04	3.66E-02	1.50E-04	4.74E-05	ND	ND	ND	ND	ND	7.52E-01	ND	0.00E+00	1.20E-04	2.20E-04	1.28E-04	-1.04E-02
POCP ("smog")[3)]	kg NMVOCe/	1.19E-02	4.54E-04	2.72E-04	1.27E-02	6.20E-05	1.35E-05	ND	ND	ND	ND	ND	2.48E-01	ND	0.00E+00	4.72E-05	5.94E-05	4.13E-05	-3.09E-03
ADP-minerals & metals[4)]	kg Sbe/FU	3.57E-04	1.46E-07	2.16E-07	3.57E-04	3.44E-08	5.53E-09	ND	ND	ND	ND	ND	1.23E-03	ND	0.00E+00	3.34E-08	1.99E-07	1.02E-08	-2.56E-04
ADP-fossil resources	MJ/FU	3.20E+01	8.26E-01	9.43E-01	3.38E+01	1.79E-01	1.92E-02	ND	ND	ND	ND	ND	2.12E+03	ND	0.00E+00	1.43E-01	6.76E-02	5.33E-02	-3.75E+00
Water use[5)]	m^3e priv. /FU	1.97E+00	3.83E-03	1.92E-02	1.99E+00	8.84E-04	2.25E-03	ND	ND	ND	ND	ND	5.77E+01	ND	0.00E+00	6.62E-04	8.23E-03	4.24E-03	-1.38E-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	1.98E-07	5.18E-09	4.25E-09	2.08E-07	1.23E-09	1.37E-10	ND	ND	ND	ND	ND	1.91E-06	ND	0.00E+00	8.07E-10	6.51E-10	4.01E-10	-3.88E-08
Ionizing radiation[6)]	kBq U235e/FU	1.75E-01	6.71E-04	2.40E-03	1.78E-01	1.56E-04	2.33E-05	ND	ND	ND	ND	ND	5.85E+01	ND	0.00E+00	1.15E-04	2.23E-04	8.26E-05	-3.40E-02
Ecotoxicity (freshwater)	CTUe/FU	2.94E+01	1.09E-01	3.02E-01	2.99E+01	2.53E-02	5.42E-02	ND	ND	ND	ND	ND	3.23E+02	ND	0.00E+00	2.26E-02	2.50E-01	3.81E+00	-1.45E+01
Human toxicity, cancer	CTUh/FU	3.53E-09	1.01E-11	2.92E-11	3.56E-09	2.04E-12	2.60E-12	ND	ND	ND	ND	ND	3.07E-08	ND	0.00E+00	1.73E-12	1.25E-11	1.03E-11	-2.21E-09
Human tox. non-cancer	CTUh/FU	2.53E-07	4.88E-10	7.84E-10	2.54E-07	1.16E-10	1.06E-10	ND	ND	ND	ND	ND	1.59E-06	ND	0.00E+00	8.93E-11	5.17E-10	5.62E-10	-2.29E-07
SQP[7)]	-/FU	1.80E+01	7.24E-01	2.26E+00	2.10E+01	1.80E-01	9.38E-03	ND	ND	ND	ND	ND	4.71E+02	ND	0.00E+00	8.52E-02	8.30E-02	7.50E-02	-6.09E+00

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	6.33E+00	1.06E-02	4.42E-04	6.35E+00	2.45E-03	-5.16E-01	ND	ND	ND	ND	ND	5.81E+02	ND	0.00E+00	1.96E-03	7.46E-03	-2.22E-01	-6.95E-01
Renew. PER as material	MJ/FU	3.23E-01	0.00E+00	4.89E-02	3.72E-01	0.00E+00	-3.71E-01	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	-5.15E-04	-7.98E-04	0.00E+00
Total use of renew. PER	MJ/FU	6.66E+00	1.06E-02	4.93E-02	6.72E+00	2.45E-03	-8.86E-01	ND	ND	ND	ND	ND	5.81E+02	ND	0.00E+00	1.96E-03	6.94E-03	-2.23E-01	-6.95E-01
Non-re. PER as energy	MJ/FU	2.88E+01	8.26E-01	6.47E-01	3.03E+01	1.79E-01	2.74E-03	ND	ND	ND	ND	ND	2.12E+03	ND	0.00E+00	1.43E-01	-1.68E+00	-1.87E+00	-3.75E+00
Non-re. PER as material	MJ/FU	3.18E+00	0.00E+00	-2.50E-01	2.93E+00	0.00E+00	-2.23E-02	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	-1.34E+00	-1.57E+00	0.00E+00
Total use of non-re. PER	MJ/FU	3.20E+01	8.26E-01	3.97E-01	3.32E+01	1.79E-01	-1.96E-02	ND	ND	ND	ND	ND	2.12E+03	ND	0.00E+00	1.43E-01	-3.02E+00	-3.44E+00	-3.75E+00
Secondary materials	kg/FU	9.65E-02	0.00E+00	0.00E+00	9.65E-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	7.64E-03	3.96E-06	3.18E-03	1.08E-02	9.68E-07	2.41E-07	ND	ND	ND	ND	ND	2.80E-03	ND	0.00E+00	8.16E-07	2.82E-06	8.62E-07	-6.99E-05
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	4.40E-02	1.13E-04	4.16E-04	4.45E-02	2.65E-05	3.65E-05	ND	ND	ND	ND	ND	1.83E+00	ND	0.00E+00	1.89E-05	1.34E-04	-2.16E-04	-6.94E-03

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg/FU	4.06E-01	1.36E-03	3.65E-03	4.11E-01	3.03E-04	5.91E-04	ND	ND	ND	ND	ND	5.36E+00	ND	0.00E+00	2.49E-04	2.30E-03	9.78E-03	-8.51E-02
Non-hazardous waste	kg/FU	1.40E+01	2.43E-02	2.21E-01	1.43E+01	5.61E-03	3.15E-02	ND	ND	ND	ND	ND	4.14E+02	ND	0.00E+00	4.67E-03	8.16E-02	5.09E-01	-5.91E+00
Radioactive waste	kg/FU	4.71E-05	1.64E-07	5.69E-07	4.78E-05	3.82E-08	5.84E-09	ND	ND	ND	ND	ND	1.50E-02	ND	0.00E+00	2.83E-08	5.50E-08	2.04E-08	-8.57E-06

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for 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	2.95E-03	2.95E-03	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	1.49E-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	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	5.48E-01	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	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	2.31E-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	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	3.17E-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 éq./FU	2.40E+00	5.81E-02	8.35E-02	2.54E+00	1.23E-02	2.90E-03	ND	ND	ND	ND	ND	9.10E+01	ND	0.00E+00	1.01E-02	1.18E-01	7.49E-02	-3.07E-01
Ozone depletion Pot.	kg CFC_{-11}e/FU	2.65E-08	6.84E-10	2.30E-09	2.95E-08	1.45E-10	2.18E-11	ND	ND	ND	ND	ND	1.40E-06	ND	0.00E+00	1.14E-10	7.08E-11	5.63E-11	-1.88E-09
Acidification	kg SO_2e/FU	2.88E-02	3.49E-04	1.71E-04	2.94E-02	3.21E-05	8.15E-06	ND	ND	ND	ND	ND	4.56E-01	ND	0.00E+00	2.60E-05	4.84E-05	2.16E-05	-1.49E-02
Eutrophication	kg PO_4^3e/FU	4.64E-03	5.54E-05	1.29E-04	4.83E-03	7.82E-06	2.54E-06	ND	ND	ND	ND	ND	5.90E-02	ND	0.00E+00	6.32E-06	1.10E-05	3.06E-05	-6.04E-04
POCP (“smog”)	kg C_2H_4e/FU	1.62E-03	2.24E-05	1.99E-05	1.66E-03	2.86E-06	6.20E-07	ND	ND	ND	ND	ND	2.48E-02	ND	0.00E+00	2.33E-06	3.00E-06	4.75E-06	-6.23E-04
ADP-elements	kg Sbe/FU	3.56E-04	1.42E-07	2.10E-07	3.57E-04	3.36E-08	4.62E-09	ND	ND	ND	ND	ND	1.22E-03	ND	0.00E+00	3.26E-08	1.96E-07	8.66E-09	-2.55E-04
ADP-fossil	MJ/FU	2.91E+01	8.15E-01	9.04E-01	3.09E+01	1.77E-01	1.88E-02	ND	ND	ND	ND	ND	1.09E+03	ND	0.00E+00	1.41E-01	6.41E-02	5.19E-02	-3.22E+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/FU	2.40E+00	5.84E-02	8.05E-02	2.54E+00	1.23E-02	2.91E-03	ND	ND	ND	ND	ND	9.13E+01	ND	0.00E+00	1.02E-02	1.18E-01	6.26E-02	-3.09E-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 characterization factor for biogenic CO2 is set to zero.

SCENARIO DOCUMENTATION

DATA SOURCES

Manufacturing energy scenario documentation – A3 (Energy data source)

1. Energy supply, electricity production, wind, Electricity production, wind, 1-3MW turbine, onshore, Poland, ecoinvent 3.10.1, 0.0176 kgCO2e/kWh
2. Energy supply, electricity production, co-generation oil and gas, Heat and power co-generation, natural gas, combined cycle power plant, 400MW electrical, Poland, ecoinvent 3.10.1, 0.0295 kgCO2e/MJ
3. Construction, specialized activities, demolition and site preparation, Market for diesel, burned in building machine, World, ecoinvent 3.10.1, 0.10 kgCO2e/MJ

Transport scenario documentation - A4

1. Transport, freight, lorry >32 metric ton, EURO5, 303.77 km
2. Transport, freight, sea, container ship, 0.0 km

Installation scenario documentation - A5 (Waste materials data source)

1. Market for packaging film, low density polyethylene, 0.011 kg
2. Market for printed paper, offset, 0.005 kg
3. Market for corrugated board box, 0.7 kg

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

1. Energy supply, electricity transformation and distribution, distribution low voltage, Market group for electricity, low voltage, Europe, 6750.0 kWh

TRANSPORT SCENARIO DOCUMENTATION - A4

Scenario parameter	Value
Capacity utilization (including empty return) %	50 %
Bulk density of transported products / kg/m3	1.69E+02
Volume capacity utilization factor (factor: =1 or <1 or ≥1 for compressed or nested packaged products)	1

INSTALLATION SCENARIO DOCUMENTATION - A5

Scenario parameter	Value
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 / m^3	0
Power output of equipment / kW	67.5
Characteristic performance, e.g., energy efficiency, emissions, variation of performance with capacity utilization, etc. / Units as appropriate	For more details see product classification table and product description.
Further assumptions for scenario development, e.g., frequency and period of use, number of occupants / Units as appropriate	For more details see product classification table and product description.

END OF LIFE SCENARIO DOCUMENTATION

Scenario information	Value
Collection process – kg collected separately	8.443
Collection process – kg collected with mixed waste	0
Recovery process – kg for re-use	0
Recovery process – kg for recycling	3.61E+00
Recovery process – kg for energy recovery	0
Disposal (total) – kg for final deposition	3.65E+00
Scenario assumptions e.g. transportation	Lorry, 16-32 metric ton, EURO5; 150 km

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

APPENDIX 1

MATERIAL COMPOSITION

The product material composition is illustrated in the table below. The material weight is given in grams and in percentage on total product weight.

Table 1: Material composition

Material	Weight (g)	Weight-%
Aluminium	2971.58	35.19
Brass	5.84	0.07
Copper	1014.18	12.01
Glass	1220.0	14.45
Other Plastics	2421.69	28.68
Paint	2.42	0.03
PCB Alu	57.92	0.69
PCB Copper	119.19	1.41
PCB Iron	102.0	1.21
PCB Non-ferrous metal	0.59	0.01
PCB Support	138.47	1.64
PCB Tin	8.44	0.1

PP / PS-High Impact PS / ABS	9.38	0.11
Silica Sand	204.0	2.42
Steel	167.01	1.98
Tin	0.7	0.01

APPENDIX 2

USE PHASE (B6) VALUES FOR DIFFERENT COUNTRY MIX

In this EPD the B6 impact has been calculated using the energy mix of EU. The table in this appendix is useful for conversion and comparison of B6 values with other energy country mix. The Global Warming Potential Total (GWP tot) value is illustrated for each country. The value refers to 1 kwh.

Example on how to use the table:

If for example this EPD was done according to EU energy mix and you want to see how the GWP total changes according to a Finland country energy mix, you can take the original value in the results table here highlighted in yellow:

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_2e	4.44E-01	4.75E-03	2.34E-02	4.72E-01	9.50E-04	8.13E-03	ND	ND	ND	ND	ND	4.06E+02	ND	0.00E+00	5.50E-04	2.23E-03	7.33E-04	-2.82E-02

Divide that value according to the EU value from the following table (EU = 3.30E-01) and then multiplying for the Finland value from the same table (FINLAND = 1.54E-01).

Thus, the calculation of this example would be:

New B6 GWP tot for Finland = (4.06E-02 / 3.30E-01) x 1.54E-01 = 1.89E-02.

Country	GWP tot (kg CO2 eq. per kwh)		
AFRICA	7.30E-01	GERMANY	3.90E-01
APAC	9.50E-01	INDIA	1.50E+00
AUSTRALIA	8.40E-01	ITALY	3.50E-01
AUSTRIA	2.30E-01	LATAM	3.90E-01
BELGIUM	2.00E-01	NAM	4.50E-01
CHINA	1.02E+00	NETHERLANDS	3.90E-01
DENMARK	1.60E-01	NORWAY	4.50E-02
EU	3.30E-01	ROW	7.30E-01
FINLAND	1.54E-01	SPAIN	2.10E-01
FRANCE	8.70E-02	SWEDEN	3.70E-02
		UK	2.60E-01

Source Ecoinvent 3.10.1

APPENDIX 3 - EPD HUB ALIGNED

This section represents the scaling method for the **B6 module**, following the PEP EcoPassport PSR for luminaries (PSR-0014-ed2.0-EN-2023 07 13). The GWP results were scaled from a reference variant of a product family, based on various light management scenarios and power inputs of the luminaires within the same product familiy.

To calculate the Scaled Impact (*SI*), we have followed the below methods:

1. Calculate the power scaling factor (PSF), which is the ratio of the power input of the variant in questions P_{in} and the power input of the base variant P_{base}.

$$PSF = \frac{P_{in}}{P_{base}}$$

2. Calculate the Total Scaling factor by multiplying the PSF by the control scaling factor (CSF), where the CSF is determined according the relevant control factor scenario (e.g. if the luminaire has a presence detection system). The presented controls factors values in Table A1 are based on BS EN 15193-1:2017. Please refer to this publication or contact Signify directly for more information.

$$TSF = PSF * CSF$$

Table 1: Light management function (PEP EcoPassport aligned)

Scenario	Abbrev.	CSF
No control	NC	1
Daylight dependency factor	DD	0.75
Presence sensing	PS	0.75
Daylight dependency and presence sensing	DD+PS	0.55

3. Lastly, the GWP of the base variant is then scaled by the TSF.

$$Scaled\ Impact = GWP_{case} * TSF$$

The following list of product configurations is not exhaustive. Please use the formula defined in point 1 above to calculate the exact power scaling factor (PSF) for any specific configuration.

Table 2: GWP per scaling factor (EPD Hub aligned)

	12NC or Product Family Code	Description	Flux [lm]	Power [W]	Efficacy [lm/W]	PSF	Total Scaling Factor (TSF)				Scaled Impacts (GWP100 B6 - kg CO2eq.)			
							NC	DD	PS	DD+PS	NC	DD	PS	DD+PS
1	BRP435/BPP435	BRP435/BPP435 LED10-4S/722	874	8.0	106.6	0.121	0.121	0.091	0.091	0.067	268.7	202.1	202.1	148.8
2	BRP435/BPP435	BRP435/BPP435 LED15-4S/722	1310	12.0	109.2	0.178	0.178	0.134	0.134	0.098	395.3	297.6	297.6	217.6
3	BRP435/BPP435	BRP435/BPP435 LED20-4S/722	1745	16.0	109.1	0.237	0.237	0.178	0.178	0.13	526.3	395.3	395.3	288.7
4	BRP435/BPP435	BRP435/BPP435 LED25-4S/722	2184	19.0	116.8	0.277	0.277	0.208	0.208	0.152	615.1	461.9	461.9	337.6
5	BRP435/BPP435	BRP435/BPP435 LED30-4S/722	2615	22.0	116.2	0.333	0.333	0.25	0.25	0.183	739.5	555.2	555.2	406.4
6	BRP435/BPP435	BRP435/BPP435 LED35-4S/722	3048	26.0	115.9	0.39	0.39	0.292	0.292	0.215	866.1	648.5	648.5	477.5
7	BRP435/BPP435	BRP435/BPP435 LED40-4S/722	3476	30.0	115.1	0.447	0.447	0.335	0.335	0.246	992.7	744.0	744.0	546.3
8	BRP435/BPP435	BRP435/BPP435 LED50-4S/722	4328	39.0	112.1	0.572	0.572	0.429	0.429	0.315	1270.3	952.7	952.7	699.5
9	BRP435/BPP435	BRP435/BPP435 LED60-4S/722	5194	44.0	119.4	0.644	0.644	0.483	0.483	0.354	1430.2	1072.6	1072.6	786.1
10	BRP435/BPP435	BRP435/BPP435 LED70-4S/722	6035	51.0	119.3	0.75	0.75	0.562	0.562	0.413	1665.6	1248.1	1248.1	917.2

11	BRP435/BPP435	BRP435/BPP435 LED80-4S/722	6862	58.0	117.7	0.864	0.864	0.648	0.648	0.475	1918.7	1439.0	1439.0	1054.9
12	BRP435/BPP435	BRP435/BPP435 LED90-4S/722	7664	66.0	115.8	0.981	0.981	0.736	0.736	0.54	2178.6	1634.5	1634.5	1199.2
13	BRP435/BPP435	BRP435/BPP435 LED100-4S/722	8437	74.0	113.7	1.099	1.099	0.824	0.824	0.604	2440.6	1829.9	1829.9	1341.3
14	BRP435/BPP435	BRP435/BPP435 LED110-4S/722	9175	82.0	111.6	1.218	1.218	0.913	0.913	0.67	2704.9	2027.5	2027.5	1487.9
15	BRP435/BPP435	BRP435/BPP435 LED10-4S/730	874	7.0	126.7	0.102	0.102	0.076	0.076	0.056	226.5	168.8	168.8	124.4
16	BRP435/BPP435	BRP435/BPP435 LED15-4S/730	1312	10.0	136.7	0.142	0.142	0.106	0.106	0.078	315.3	235.4	235.4	173.2
17	BRP435/BPP435	BRP435/BPP435 LED20-4S/730	1749	13.0	136.6	0.19	0.19	0.143	0.143	0.105	421.9	317.6	317.6	233.2
18	BRP435/BPP435	BRP435/BPP435 LED25-4S/730	2186	15.0	143.8	0.225	0.225	0.169	0.169	0.124	499.7	375.3	375.3	275.4
19	BRP435/BPP435	BRP435/BPP435 LED30-4S/730	2620	18.0	145.6	0.267	0.267	0.2	0.2	0.147	592.9	444.2	444.2	326.5
20	BRP435/BPP435	BRP435/BPP435 LED35-4S/730	3054	21.0	144.7	0.313	0.313	0.235	0.235	0.172	695.1	521.9	521.9	382.0
21	BRP435/BPP435	BRP435/BPP435 LED40-4S/730	3487	24.0	144.1	0.359	0.359	0.269	0.269	0.197	797.2	597.4	597.4	437.5
22	BRP435/BPP435	BRP435/BPP435 LED50-4S/730	4350	31.0	142.2	0.453	0.453	0.34	0.34	0.249	1006.0	755.1	755.1	553.0
23	BRP435/BPP435	BRP435/BPP435 LED60-4S/730	5204	38.0	138.8	0.556	0.556	0.417	0.417	0.306	1234.7	926.1	926.1	679.5
24	BRP435/BPP435	BRP435/BPP435 LED70-4S/730	6078	41.0	148.6	0.606	0.606	0.455	0.455	0.333	1345.8	1010.4	1010.4	739.5

25	BRP435/BPP435	BRP435/BPP435 LED80-4S/730	6925	47.0	148.6	0.69	0.69	0.517	0.517	0.38	1532.3	1148.1	1148.1	843.9
26	BRP435/BPP435	BRP435/BPP435 LED90-4S/730	7759	53.0	147.2	0.781	0.781	0.586	0.586	0.43	1734.4	1301.4	1301.4	954.9
27	BRP435/BPP435	BRP435/BPP435 LED100-4S/730	8586	59.0	145.3	0.876	0.876	0.657	0.657	0.482	1945.4	1459.0	1459.0	1070.4
28	BRP435/BPP435	BRP435/BPP435 LED110-4S/730	9387	66.0	143.1	0.972	0.972	0.729	0.729	0.535	2158.6	1618.9	1618.9	1188.1
29	BRP435/BPP435	BRP435/BPP435 LED120-4S/730	10167	72.0	141.0	1.068	1.068	0.801	0.801	0.587	2371.8	1778.8	1778.8	1303.6
30	BRP435/BPP435	BRP435/BPP435 LED10-4S/740	874	6.6	132.4	0.098	0.098	0.074	0.074	0.054	217.6	164.3	164.3	119.9
31	BRP435/BPP435	BRP435/BPP435 LED15-4S/740	1312	9.0	144.2	0.135	0.135	0.101	0.101	0.074	299.8	224.3	224.3	164.3
32	BRP435/BPP435	BRP435/BPP435 LED20-4S/740	1749	12.0	144.5	0.179	0.179	0.134	0.134	0.098	397.5	297.6	297.6	217.6
33	BRP435/BPP435	BRP435/BPP435 LED25-4S/740	2186	14.0	151.8	0.213	0.213	0.16	0.16	0.117	473.0	355.3	355.3	259.8
34	BRP435/BPP435	BRP435/BPP435 LED30-4S/740	2620	17.0	154.1	0.252	0.252	0.189	0.189	0.139	559.6	419.7	419.7	308.7
35	BRP435/BPP435	BRP435/BPP435 LED35-4S/740	3057	20.0	154.4	0.293	0.293	0.22	0.22	0.161	650.7	488.6	488.6	357.5
36	BRP435/BPP435	BRP435/BPP435 LED40-4S/740	3490	23.0	153.1	0.338	0.338	0.254	0.254	0.186	750.6	564.1	564.1	413.1
37	BRP435/BPP435	BRP435/BPP435 LED50-4S/740	4354	29.0	151.7	0.425	0.425	0.319	0.319	0.234	943.8	708.4	708.4	519.7
38	BRP435/BPP435	BRP435/BPP435 LED60-4S/740	5209	35.0	148.4	0.52	0.52	0.39	0.39	0.286	1154.8	866.1	866.1	635.1

39	BRP435/BPP435	BRP435/BPP435 LED70-4S/740	6059	42.0	145.0	0.619	0.619	0.464	0.464	0.34	1374.6	1030.4	1030.4	755.1
40	BRP435/BPP435	BRP435/BPP435 LED80-4S/740	6932	44.0	157.5	0.652	0.652	0.489	0.489	0.359	1447.9	1085.9	1085.9	797.2
41	BRP435/BPP435	BRP435/BPP435 LED90-4S/740	7775	49.0	157.4	0.732	0.732	0.549	0.549	0.403	1625.6	1219.2	1219.2	895.0
42	BRP435/BPP435	BRP435/BPP435 LED100-4S/740	8612	55.0	155.5	0.821	0.821	0.616	0.616	0.452	1823.2	1368.0	1368.0	1003.8
43	BRP435/BPP435	BRP435/BPP435 LED110-4S/740	9425	61.0	153.5	0.91	0.91	0.682	0.682	0.501	2020.9	1514.6	1514.6	1112.6
44	BRP435/BPP435	BRP435/BPP435 LED120-4S/740	10219	68.0	151.2	1.001	1.001	0.751	0.751	0.551	2223.0	1667.8	1667.8	1223.6
45	BRP435/BPP435	BRP435/BPP435 LED10-4S/827	874	8.0	109.2	0.119	0.119	0.089	0.089	0.065	264.3	197.6	197.6	144.3
46	BRP435/BPP435	BRP435/BPP435 LED15-4S/827	1310	12.0	113.9	0.17	0.17	0.128	0.128	0.094	377.5	284.3	284.3	208.8
47	BRP435/BPP435	BRP435/BPP435 LED20-4S/827	1745	15.0	113.3	0.228	0.228	0.171	0.171	0.125	506.3	379.7	379.7	277.6
48	BRP435/BPP435	BRP435/BPP435 LED25-4S/827	2184	18.0	121.3	0.267	0.267	0.2	0.2	0.147	592.9	444.2	444.2	326.5
49	BRP435/BPP435	BRP435/BPP435 LED30-4S/827	2618	22.0	120.6	0.321	0.321	0.241	0.241	0.177	712.9	535.2	535.2	393.1
50	BRP435/BPP435	BRP435/BPP435 LED35-4S/827	3048	25.0	120.5	0.375	0.375	0.281	0.281	0.206	832.8	624.0	624.0	457.5
51	BRP435/BPP435	BRP435/BPP435 LED40-4S/827	3480	29.0	119.6	0.431	0.431	0.323	0.323	0.237	957.1	717.3	717.3	526.3
52	BRP435/BPP435	BRP435/BPP435 LED50-4S/827	4332	37.0	116.8	0.55	0.55	0.413	0.413	0.303	1221.4	917.2	917.2	672.9

53	BRP435/BPP435	BRP435/BPP435 LED60-4S/827	5199	42.0	123.8	0.622	0.622	0.467	0.467	0.342	1381.3	1037.1	1037.1	759.5
54	BRP435/BPP435	BRP435/BPP435 LED70-4S/827	6041	49.0	124.0	0.721	0.721	0.541	0.541	0.397	1601.2	1201.4	1201.4	881.6
55	BRP435/BPP435	BRP435/BPP435 LED80-4S/827	6869	56.0	122.2	0.833	0.833	0.625	0.625	0.458	1849.9	1388.0	1388.0	1017.1
56	BRP435/BPP435	BRP435/BPP435 LED90-4S/827	7680	64.0	120.6	0.944	0.944	0.708	0.708	0.519	2096.4	1572.3	1572.3	1152.6
57	BRP435/BPP435	BRP435/BPP435 LED100-4S/827	8464	71.0	118.5	1.058	1.058	0.794	0.794	0.582	2349.6	1763.3	1763.3	1292.5
58	BRP435/BPP435	BRP435/BPP435 LED110-4S/827	9223	79.0	116.6	1.172	1.172	0.879	0.879	0.645	2602.7	1952.0	1952.0	1432.4
59	BRP435/BPP435	BRP435/BPP435 LED10-4S/830	874	7.6	115.0	0.113	0.113	0.085	0.085	0.062	250.9	188.8	188.8	137.7
60	BRP435/BPP435	BRP435/BPP435 LED15-4S/830	1310	11.0	119.1	0.163	0.163	0.122	0.122	0.09	362.0	270.9	270.9	199.9
61	BRP435/BPP435	BRP435/BPP435 LED20-4S/830	1745	14.0	120.3	0.215	0.215	0.161	0.161	0.118	477.5	357.5	357.5	262.0
62	BRP435/BPP435	BRP435/BPP435 LED25-4S/830	2184	17.0	127.7	0.253	0.253	0.19	0.19	0.139	561.8	421.9	421.9	308.7
63	BRP435/BPP435	BRP435/BPP435 LED30-4S/830	2618	21.0	127.1	0.305	0.305	0.229	0.229	0.168	677.3	508.6	508.6	373.1
64	BRP435/BPP435	BRP435/BPP435 LED35-4S/830	3051	24.0	126.6	0.357	0.357	0.268	0.268	0.196	792.8	595.2	595.2	435.3
65	BRP435/BPP435	BRP435/BPP435 LED40-4S/830	3480	28.0	126.5	0.407	0.407	0.305	0.305	0.224	903.8	677.3	677.3	497.4
66	BRP435/BPP435	BRP435/BPP435 LED50-4S/830	4337	35.0	123.9	0.519	0.519	0.389	0.389	0.285	1152.6	863.9	863.9	632.9

67	BRP435/BPP435	BRP435/BPP435 LED60-4S/830	5183	43.0	120.8	0.636	0.636	0.477	0.477	0.35	1412.4	1059.3	1059.3	777.3
68	BRP435/BPP435	BRP435/BPP435 LED70-4S/830	6047	46.0	130.3	0.687	0.687	0.515	0.515	0.378	1525.7	1143.7	1143.7	839.4
69	BRP435/BPP435	BRP435/BPP435 LED80-4S/830	6883	53.0	129.4	0.788	0.788	0.591	0.591	0.433	1750.0	1312.5	1312.5	961.6
70	BRP435/BPP435	BRP435/BPP435 LED90-4S/830	7704	60.0	127.8	0.893	0.893	0.67	0.67	0.491	1983.1	1487.9	1487.9	1090.4
71	BRP435/BPP435	BRP435/BPP435 LED100-4S/830	8499	68.0	125.9	1.0	1.0	0.75	0.75	0.55	2220.8	1665.6	1665.6	1221.4
72	BRP435/BPP435	BRP435/BPP435 LED110-4S/830	9271	75.0	123.9	1.108	1.108	0.831	0.831	0.609	2460.6	1845.4	1845.4	1352.4
73	BRP435/BPP435	BRP435/BPP435 LED120-4S/830	10009	82.0	121.9	1.216	1.216	0.912	0.912	0.669	2700.4	2025.3	2025.3	1485.7
74	BRP435/BPP435	BRP435/BPP435 LED10-4S/840	874	7.0	121.4	0.107	0.107	0.08	0.08	0.059	237.6	177.7	177.7	131.0
75	BRP435/BPP435	BRP435/BPP435 LED15-4S/840	1310	10.0	127.2	0.153	0.153	0.115	0.115	0.084	339.8	255.4	255.4	186.5
76	BRP435/BPP435	BRP435/BPP435 LED20-4S/840	1747	14.0	128.5	0.201	0.201	0.151	0.151	0.111	446.4	335.3	335.3	246.5
77	BRP435/BPP435	BRP435/BPP435 LED25-4S/840	2184	16.0	134.8	0.24	0.24	0.18	0.18	0.132	533.0	399.7	399.7	293.1
78	BRP435/BPP435	BRP435/BPP435 LED30-4S/840	2618	19.0	135.6	0.286	0.286	0.214	0.214	0.157	635.1	475.2	475.2	348.7
79	BRP435/BPP435	BRP435/BPP435 LED35-4S/840	3051	22.0	135.6	0.333	0.333	0.25	0.25	0.183	739.5	555.2	555.2	406.4
80	BRP435/BPP435	BRP435/BPP435 LED40-4S/840	3483	26.0	135.0	0.382	0.382	0.286	0.286	0.21	848.3	635.1	635.1	466.4

81	BRP435/BPP435	BRP435/BPP435 LED50-4S/840	4341	33.0	133.2	0.483	0.483	0.362	0.362	0.266	1072.6	803.9	803.9	590.7
82	BRP435/BPP435	BRP435/BPP435 LED60-4S/840	5188	40.0	130.0	0.591	0.591	0.443	0.443	0.325	1312.5	983.8	983.8	721.7
83	BRP435/BPP435	BRP435/BPP435 LED70-4S/840	6059	44.0	139.0	0.646	0.646	0.485	0.485	0.355	1434.6	1077.1	1077.1	788.4
84	BRP435/BPP435	BRP435/BPP435 LED80-4S/840	6897	50.0	139.1	0.735	0.735	0.551	0.551	0.404	1632.3	1223.6	1223.6	897.2
85	BRP435/BPP435	BRP435/BPP435 LED90-4S/840	7727	56.0	137.2	0.834	0.834	0.625	0.625	0.459	1852.1	1388.0	1388.0	1019.3
86	BRP435/BPP435	BRP435/BPP435 LED100-4S/840	8534	63.0	135.5	0.933	0.933	0.7	0.7	0.513	2072.0	1554.5	1554.5	1139.2
87	BRP435/BPP435	BRP435/BPP435 LED110-4S/840	9329	70.0	133.7	1.034	1.034	0.776	0.776	0.569	2296.3	1723.3	1723.3	1263.6
88	BRP435/BPP435	BRP435/BPP435 LED120-4S/840	10083	77.0	131.6	1.135	1.135	0.851	0.851	0.624	2520.6	1889.9	1889.9	1385.7
89	BRP435/BPP435	BRP435/BPP435 LED10-4S/727	874	7.4	118.1	0.11	0.11	0.083	0.083	0.061	244.3	184.3	184.3	135.5
90	BRP435/BPP435	BRP435/BPP435 LED15-4S/727	1310	11.0	123.6	0.157	0.157	0.118	0.118	0.086	348.7	262.0	262.0	191.0
91	BRP435/BPP435	BRP435/BPP435 LED20-4S/727	1747	14.0	123.9	0.209	0.209	0.157	0.157	0.115	464.1	348.7	348.7	255.4
92	BRP435/BPP435	BRP435/BPP435 LED25-4S/727	2184	17.0	131.6	0.246	0.246	0.184	0.184	0.135	546.3	408.6	408.6	299.8
93	BRP435/BPP435	BRP435/BPP435 LED30-4S/727	2618	20.0	131.6	0.295	0.295	0.221	0.221	0.162	655.1	490.8	490.8	359.8
94	BRP435/BPP435	BRP435/BPP435 LED35-4S/727	3051	23.0	130.9	0.345	0.345	0.259	0.259	0.19	766.2	575.2	575.2	421.9

95	BRP435/BPP435	BRP435/BPP435 LED40-4S/727	3483	27.0	130.9	0.394	0.394	0.295	0.295	0.217	875.0	655.1	655.1	481.9
96	BRP435/BPP435	BRP435/BPP435 LED50-4S/727	4337	34.0	128.3	0.501	0.501	0.376	0.376	0.276	1112.6	835.0	835.0	612.9
97	BRP435/BPP435	BRP435/BPP435 LED60-4S/727	5183	41.0	125.2	0.613	0.613	0.46	0.46	0.337	1361.3	1021.5	1021.5	748.4
98	BRP435/BPP435	BRP435/BPP435 LED70-4S/727	6053	45.0	134.8	0.665	0.665	0.499	0.499	0.366	1476.8	1108.2	1108.2	812.8
99	BRP435/BPP435	BRP435/BPP435 LED80-4S/727	6890	51.0	134.3	0.76	0.76	0.57	0.57	0.418	1687.8	1265.8	1265.8	928.3
100	BRP435/BPP435	BRP435/BPP435 LED90-4S/727	7720	58.0	132.6	0.862	0.862	0.646	0.646	0.474	1914.3	1434.6	1434.6	1052.6
101	BRP435/BPP435	BRP435/BPP435 LED100-4S/727	8525	65.0	130.8	0.966	0.966	0.724	0.724	0.531	2145.2	1607.8	1607.8	1179.2
102	BRP435/BPP435	BRP435/BPP435 LED110-4S/727	9300	72.0	128.8	1.07	1.07	0.802	0.802	0.589	2376.2	1781.0	1781.0	1308.0
103	BRP435/BPP435	BRP435/BPP435 LED120-4S/727	10051	79.0	126.7	1.175	1.175	0.881	0.881	0.646	2609.4	1956.5	1956.5	1434.6

PEP ECOPASSPORT ALIGNED

This section represents the scaling method for the **B6 module**, following the PEP EcoPassport PSR for luminaries (PSR-0014-ed2.0-EN-2023 07 13). The GWP results were scaled from a refernce variant of a product family, based on various light management functions, the lumen output (O_{lum}) and reference service life (*RSL*) of each product within the same product familiy.

To calculate the Scaled Impact (SI_{pep}), we have followed the below methods:

1. Calculate the power scaling factor (PSF), which is the ratio of the power input of the variant in questions P_{in} and the power input of the base variant P_{base}.

$$PSF = \frac{P_{in}}{P_{base}}$$

2. Using this scaled GWP, we then can apply the PEP Ecopassport method for calculating the environmental impact of the functional unit for a luminary (1000 lumens over 35000 hours), applied to B6, where the Functional Unit application considers the lumen output (Olum) and reference service lifetime (RSL) of the product to estimate the final environmental impact. The scaled impact (SIpep) is presented in Table A4.

$$GSF = \frac{FU_{pep}}{FU_p} = \frac{1{,}000}{O_{lum}} * \frac{35{,}000}{RSL}$$

3. Calculate the GWP scaling factor (P*GSF*), by multiplying the PSF by the GSF.

$$PGSF = PSF * GSF$$

4. Calculate the Total Scaling factor by multiplying the PSF by the control scaling factor (CSF), where the CSF is determined according the relevant control factor scenario (e.g. if the luminaire has a presence detection system), as presented in Table A1.

$$TSF = PGSF * CSF$$

Table 3: Light management functions (PEP EcoPassport aligned)

Scenario	Abbrev.	CSF
No control	NC	1
Daylight dependency factor	DD	0.75
Presence sensing	PS	0.75
Daylight dependency and presence sensing	DD+PS	0.55

5. Lastly, the GWP of the base variant is then scaled by the TSF.

$$Scaled\ GWP = GWP_{case} * TSF$$

Table 4: Impact per scaling factor (PEP EcoPassport aligned)

	12NC or Product Family Code	Description	Flux [lm]	Power [W]	Efficacy [lm/W]	PSF	Total Scaling Factor (TSF)				Scaled Impacts (GWP100 B6 - kg CO2eq.)			
							NC	DD	PS	DD+PS	NC	DD	PS	DD+PS
1	BRP435/BPP435	BRP435/BPP435 LED10-4S/722	874	8.0	106.6	0.121	0.048	0.036	0.036	0.026	106.6	79.9	79.9	57.7
2	BRP435/BPP435	BRP435/BPP435 LED15-4S/722	1310	12.0	109.2	0.178	0.048	0.036	0.036	0.026	106.6	79.9	79.9	57.7
3	BRP435/BPP435	BRP435/BPP435 LED20-4S/722	1745	16.0	109.1	0.237	0.048	0.036	0.036	0.026	106.6	79.9	79.9	57.7
4	BRP435/BPP435	BRP435/BPP435 LED25-4S/722	2184	19.0	116.8	0.277	0.044	0.033	0.033	0.024	97.7	73.3	73.3	53.3
5	BRP435/BPP435	BRP435/BPP435 LED30-4S/722	2615	22.0	116.2	0.333	0.045	0.034	0.034	0.025	99.9	75.5	75.5	55.5
6	BRP435/BPP435	BRP435/BPP435 LED35-4S/722	3048	26.0	115.9	0.39	0.045	0.034	0.034	0.025	99.9	75.5	75.5	55.5
7	BRP435/BPP435	BRP435/BPP435 LED40-4S/722	3476	30.0	115.1	0.447	0.045	0.034	0.034	0.025	99.9	75.5	75.5	55.5
8	BRP435/BPP435	BRP435/BPP435 LED50-4S/722	4328	39.0	112.1	0.572	0.046	0.035	0.035	0.025	102.2	77.7	77.7	55.5
9	BRP435/BPP435	BRP435/BPP435 LED60-4S/722	5194	44.0	119.4	0.644	0.043	0.032	0.032	0.024	95.5	71.1	71.1	53.3
10	BRP435/BPP435	BRP435/BPP435 LED70-4S/722	6035	51.0	119.3	0.75	0.044	0.033	0.033	0.024	97.7	73.3	73.3	53.3
11	BRP435/BPP435	BRP435/BPP435 LED80-4S/722	6862	58.0	117.7	0.864	0.044	0.033	0.033	0.024	97.7	73.3	73.3	53.3
12	BRP435/BPP435	BRP435/BPP435 LED90-4S/722	7664	66.0	115.8	0.981	0.045	0.034	0.034	0.025	99.9	75.5	75.5	55.5

13	BRP435/BPP435	BRP435/BPP435 LED100-4S/722	8437	74.0	113.7	1.099	0.045	0.034	0.034	0.025	99.9	75.5	75.5	55.5
14	BRP435/BPP435	BRP435/BPP435 LED110-4S/722	9175	82.0	111.6	1.218	0.046	0.035	0.035	0.025	102.2	77.7	77.7	55.5
15	BRP435/BPP435	BRP435/BPP435 LED10-4S/730	874	7.0	126.7	0.102	0.041	0.031	0.031	0.023	91.1	68.8	68.8	51.1
16	BRP435/BPP435	BRP435/BPP435 LED15-4S/730	1312	10.0	136.7	0.142	0.038	0.028	0.028	0.021	84.4	62.2	62.2	46.6
17	BRP435/BPP435	BRP435/BPP435 LED20-4S/730	1749	13.0	136.6	0.19	0.038	0.028	0.028	0.021	84.4	62.2	62.2	46.6
18	BRP435/BPP435	BRP435/BPP435 LED25-4S/730	2186	15.0	143.8	0.225	0.036	0.027	0.027	0.02	79.9	60.0	60.0	44.4
19	BRP435/BPP435	BRP435/BPP435 LED30-4S/730	2620	18.0	145.6	0.267	0.036	0.027	0.027	0.02	79.9	60.0	60.0	44.4
20	BRP435/BPP435	BRP435/BPP435 LED35-4S/730	3054	21.0	144.7	0.313	0.036	0.027	0.027	0.02	79.9	60.0	60.0	44.4
21	BRP435/BPP435	BRP435/BPP435 LED40-4S/730	3487	24.0	144.1	0.359	0.036	0.027	0.027	0.02	79.9	60.0	60.0	44.4
22	BRP435/BPP435	BRP435/BPP435 LED50-4S/730	4350	31.0	142.2	0.453	0.036	0.027	0.027	0.02	79.9	60.0	60.0	44.4
23	BRP435/BPP435	BRP435/BPP435 LED60-4S/730	5204	38.0	138.8	0.556	0.037	0.028	0.028	0.02	82.2	62.2	62.2	44.4
24	BRP435/BPP435	BRP435/BPP435 LED70-4S/730	6078	41.0	148.6	0.606	0.035	0.026	0.026	0.019	77.7	57.7	57.7	42.2
25	BRP435/BPP435	BRP435/BPP435 LED80-4S/730	6925	47.0	148.6	0.69	0.035	0.026	0.026	0.019	77.7	57.7	57.7	42.2
26	BRP435/BPP435	BRP435/BPP435 LED90-4S/730	7759	53.0	147.2	0.781	0.035	0.026	0.026	0.019	77.7	57.7	57.7	42.2

27	BRP435/BPP435	BRP435/BPP435 LED100-4S/730	8586	59.0	145.3	0.876	0.036	0.027	0.027	0.02	79.9	60.0	60.0	44.4
28	BRP435/BPP435	BRP435/BPP435 LED110-4S/730	9387	66.0	143.1	0.972	0.036	0.027	0.027	0.02	79.9	60.0	60.0	44.4
29	BRP435/BPP435	BRP435/BPP435 LED120-4S/730	10167	72.0	141.0	1.068	0.036	0.027	0.027	0.02	79.9	60.0	60.0	44.4
30	BRP435/BPP435	BRP435/BPP435 LED10-4S/740	874	6.6	132.4	0.098	0.039	0.029	0.029	0.021	86.6	64.4	64.4	46.6
31	BRP435/BPP435	BRP435/BPP435 LED15-4S/740	1312	9.0	144.2	0.135	0.036	0.027	0.027	0.02	79.9	60.0	60.0	44.4
32	BRP435/BPP435	BRP435/BPP435 LED20-4S/740	1749	12.0	144.5	0.179	0.036	0.027	0.027	0.02	79.9	60.0	60.0	44.4
33	BRP435/BPP435	BRP435/BPP435 LED25-4S/740	2186	14.0	151.8	0.213	0.034	0.026	0.026	0.019	75.5	57.7	57.7	42.2
34	BRP435/BPP435	BRP435/BPP435 LED30-4S/740	2620	17.0	154.1	0.252	0.034	0.026	0.026	0.019	75.5	57.7	57.7	42.2
35	BRP435/BPP435	BRP435/BPP435 LED35-4S/740	3057	20.0	154.4	0.293	0.033	0.025	0.025	0.018	73.3	55.5	55.5	40.0
36	BRP435/BPP435	BRP435/BPP435 LED40-4S/740	3490	23.0	153.1	0.338	0.034	0.026	0.026	0.019	75.5	57.7	57.7	42.2
37	BRP435/BPP435	BRP435/BPP435 LED50-4S/740	4354	29.0	151.7	0.425	0.034	0.026	0.026	0.019	75.5	57.7	57.7	42.2
38	BRP435/BPP435	BRP435/BPP435 LED60-4S/740	5209	35.0	148.4	0.52	0.035	0.026	0.026	0.019	77.7	57.7	57.7	42.2
39	BRP435/BPP435	BRP435/BPP435 LED70-4S/740	6059	42.0	145.0	0.619	0.036	0.027	0.027	0.02	79.9	60.0	60.0	44.4
40	BRP435/BPP435	BRP435/BPP435 LED80-4S/740	6932	44.0	157.5	0.652	0.033	0.025	0.025	0.018	73.3	55.5	55.5	40.0

41	BRP435/BPP435	BRP435/BPP435 LED90-4S/740	7775	49.0	157.4	0.732	0.033	0.025	0.025	0.018	73.3	55.5	55.5	40.0
42	BRP435/BPP435	BRP435/BPP435 LED100-4S/740	8612	55.0	155.5	0.821	0.034	0.026	0.026	0.019	75.5	57.7	57.7	42.2
43	BRP435/BPP435	BRP435/BPP435 LED110-4S/740	9425	61.0	153.5	0.91	0.034	0.026	0.026	0.019	75.5	57.7	57.7	42.2
44	BRP435/BPP435	BRP435/BPP435 LED120-4S/740	10219	68.0	151.2	1.001	0.034	0.026	0.026	0.019	75.5	57.7	57.7	42.2
45	BRP435/BPP435	BRP435/BPP435 LED10-4S/827	874	8.0	109.2	0.119	0.048	0.036	0.036	0.026	106.6	79.9	79.9	57.7
46	BRP435/BPP435	BRP435/BPP435 LED15-4S/827	1310	12.0	113.9	0.17	0.045	0.034	0.034	0.025	99.9	75.5	75.5	55.5
47	BRP435/BPP435	BRP435/BPP435 LED20-4S/827	1745	15.0	113.3	0.228	0.046	0.035	0.035	0.025	102.2	77.7	77.7	55.5
48	BRP435/BPP435	BRP435/BPP435 LED25-4S/827	2184	18.0	121.3	0.267	0.043	0.032	0.032	0.024	95.5	71.1	71.1	53.3
49	BRP435/BPP435	BRP435/BPP435 LED30-4S/827	2618	22.0	120.6	0.321	0.043	0.032	0.032	0.024	95.5	71.1	71.1	53.3
50	BRP435/BPP435	BRP435/BPP435 LED35-4S/827	3048	25.0	120.5	0.375	0.043	0.032	0.032	0.024	95.5	71.1	71.1	53.3
51	BRP435/BPP435	BRP435/BPP435 LED40-4S/827	3480	29.0	119.6	0.431	0.044	0.033	0.033	0.024	97.7	73.3	73.3	53.3
52	BRP435/BPP435	BRP435/BPP435 LED50-4S/827	4332	37.0	116.8	0.55	0.045	0.034	0.034	0.025	99.9	75.5	75.5	55.5
53	BRP435/BPP435	BRP435/BPP435 LED60-4S/827	5199	42.0	123.8	0.622	0.042	0.032	0.032	0.023	93.3	71.1	71.1	51.1
54	BRP435/BPP435	BRP435/BPP435 LED70-4S/827	6041	49.0	124.0	0.721	0.042	0.032	0.032	0.023	93.3	71.1	71.1	51.1

55	BRP435/BPP435	BRP435/BPP435 LED80-4S/827	6869	56.0	122.2	0.833	0.042	0.032	0.032	0.023	93.3	71.1	71.1	51.1
56	BRP435/BPP435	BRP435/BPP435 LED90-4S/827	7680	64.0	120.6	0.944	0.043	0.032	0.032	0.024	95.5	71.1	71.1	53.3
57	BRP435/BPP435	BRP435/BPP435 LED100-4S/827	8464	71.0	118.5	1.058	0.043	0.032	0.032	0.024	95.5	71.1	71.1	53.3
58	BRP435/BPP435	BRP435/BPP435 LED110-4S/827	9223	79.0	116.6	1.172	0.045	0.034	0.034	0.025	99.9	75.5	75.5	55.5
59	BRP435/BPP435	BRP435/BPP435 LED10-4S/830	874	7.6	115.0	0.113	0.045	0.034	0.034	0.025	99.9	75.5	75.5	55.5
60	BRP435/BPP435	BRP435/BPP435 LED15-4S/830	1310	11.0	119.1	0.163	0.044	0.033	0.033	0.024	97.7	73.3	73.3	53.3
61	BRP435/BPP435	BRP435/BPP435 LED20-4S/830	1745	14.0	120.3	0.215	0.043	0.032	0.032	0.024	95.5	71.1	71.1	53.3
62	BRP435/BPP435	BRP435/BPP435 LED25-4S/830	2184	17.0	127.7	0.253	0.04	0.03	0.03	0.022	88.8	66.6	66.6	48.9
63	BRP435/BPP435	BRP435/BPP435 LED30-4S/830	2618	21.0	127.1	0.305	0.041	0.031	0.031	0.023	91.1	68.8	68.8	51.1
64	BRP435/BPP435	BRP435/BPP435 LED35-4S/830	3051	24.0	126.6	0.357	0.041	0.031	0.031	0.023	91.1	68.8	68.8	51.1
65	BRP435/BPP435	BRP435/BPP435 LED40-4S/830	3480	28.0	126.5	0.407	0.041	0.031	0.031	0.023	91.1	68.8	68.8	51.1
66	BRP435/BPP435	BRP435/BPP435 LED50-4S/830	4337	35.0	123.9	0.519	0.042	0.032	0.032	0.023	93.3	71.1	71.1	51.1
67	BRP435/BPP435	BRP435/BPP435 LED60-4S/830	5183	43.0	120.8	0.636	0.043	0.032	0.032	0.024	95.5	71.1	71.1	53.3
68	BRP435/BPP435	BRP435/BPP435 LED70-4S/830	6047	46.0	130.3	0.687	0.04	0.03	0.03	0.022	88.8	66.6	66.6	48.9

69	BRP435/BPP435	BRP435/BPP435 LED80-4S/830	6883	53.0	129.4	0.788	0.04	0.03	0.03	0.022	88.8	66.6	66.6	48.9
70	BRP435/BPP435	BRP435/BPP435 LED90-4S/830	7704	60.0	127.8	0.893	0.04	0.03	0.03	0.022	88.8	66.6	66.6	48.9
71	BRP435/BPP435	BRP435/BPP435 LED100-4S/830	8499	68.0	125.9	1.0	0.041	0.031	0.031	0.023	91.1	68.8	68.8	51.1
72	BRP435/BPP435	BRP435/BPP435 LED110-4S/830	9271	75.0	123.9	1.108	0.042	0.032	0.032	0.023	93.3	71.1	71.1	51.1
73	BRP435/BPP435	BRP435/BPP435 LED120-4S/830	10009	82.0	121.9	1.216	0.043	0.032	0.032	0.024	95.5	71.1	71.1	53.3
74	BRP435/BPP435	BRP435/BPP435 LED10-4S/840	874	7.0	121.4	0.107	0.043	0.032	0.032	0.024	95.5	71.1	71.1	53.3
75	BRP435/BPP435	BRP435/BPP435 LED15-4S/840	1310	10.0	127.2	0.153	0.041	0.031	0.031	0.023	91.1	68.8	68.8	51.1
76	BRP435/BPP435	BRP435/BPP435 LED20-4S/840	1747	14.0	128.5	0.201	0.04	0.03	0.03	0.022	88.8	66.6	66.6	48.9
77	BRP435/BPP435	BRP435/BPP435 LED25-4S/840	2184	16.0	134.8	0.24	0.038	0.028	0.028	0.021	84.4	62.2	62.2	46.6
78	BRP435/BPP435	BRP435/BPP435 LED30-4S/840	2618	19.0	135.6	0.286	0.038	0.028	0.028	0.021	84.4	62.2	62.2	46.6
79	BRP435/BPP435	BRP435/BPP435 LED35-4S/840	3051	22.0	135.6	0.333	0.038	0.028	0.028	0.021	84.4	62.2	62.2	46.6
80	BRP435/BPP435	BRP435/BPP435 LED40-4S/840	3483	26.0	135.0	0.382	0.038	0.028	0.028	0.021	84.4	62.2	62.2	46.6
81	BRP435/BPP435	BRP435/BPP435 LED50-4S/840	4341	33.0	133.2	0.483	0.039	0.029	0.029	0.021	86.6	64.4	64.4	46.6
82	BRP435/BPP435	BRP435/BPP435 LED60-4S/840	5188	40.0	130.0	0.591	0.04	0.03	0.03	0.022	88.8	66.6	66.6	48.9

83	BRP435/BPP435	BRP435/BPP435 LED70-4S/840	6059	44.0	139.0	0.646	0.037	0.028	0.028	0.02	82.2	62.2	62.2	44.4
84	BRP435/BPP435	BRP435/BPP435 LED80-4S/840	6897	50.0	139.1	0.735	0.037	0.028	0.028	0.02	82.2	62.2	62.2	44.4
85	BRP435/BPP435	BRP435/BPP435 LED90-4S/840	7727	56.0	137.2	0.834	0.038	0.028	0.028	0.021	84.4	62.2	62.2	46.6
86	BRP435/BPP435	BRP435/BPP435 LED100-4S/840	8534	63.0	135.5	0.933	0.038	0.028	0.028	0.021	84.4	62.2	62.2	46.6
87	BRP435/BPP435	BRP435/BPP435 LED110-4S/840	9329	70.0	133.7	1.034	0.039	0.029	0.029	0.021	86.6	64.4	64.4	46.6
88	BRP435/BPP435	BRP435/BPP435 LED120-4S/840	10083	77.0	131.6	1.135	0.04	0.03	0.03	0.022	88.8	66.6	66.6	48.9
89	BRP435/BPP435	BRP435/BPP435 LED10-4S/727	874	7.4	118.1	0.11	0.044	0.033	0.033	0.024	97.7	73.3	73.3	53.3
90	BRP435/BPP435	BRP435/BPP435 LED15-4S/727	1310	11.0	123.6	0.157	0.042	0.032	0.032	0.023	93.3	71.1	71.1	51.1
91	BRP435/BPP435	BRP435/BPP435 LED20-4S/727	1747	14.0	123.9	0.209	0.042	0.032	0.032	0.023	93.3	71.1	71.1	51.1
92	BRP435/BPP435	BRP435/BPP435 LED25-4S/727	2184	17.0	131.6	0.246	0.039	0.029	0.029	0.021	86.6	64.4	64.4	46.6
93	BRP435/BPP435	BRP435/BPP435 LED30-4S/727	2618	20.0	131.6	0.295	0.04	0.03	0.03	0.022	88.8	66.6	66.6	48.9
94	BRP435/BPP435	BRP435/BPP435 LED35-4S/727	3051	23.0	130.9	0.345	0.04	0.03	0.03	0.022	88.8	66.6	66.6	48.9
95	BRP435/BPP435	BRP435/BPP435 LED40-4S/727	3483	27.0	130.9	0.394	0.039	0.029	0.029	0.021	86.6	64.4	64.4	46.6
96	BRP435/BPP435	BRP435/BPP435 LED50-4S/727	4337	34.0	128.3	0.501	0.041	0.031	0.031	0.023	91.1	68.8	68.8	51.1

97	BRP435/BPP435	BRP435/BPP435 LED60-4S/727	5183	41.0	125.2	0.613	0.042	0.032	0.032	0.023	93.3	71.1	71.1	51.1
98	BRP435/BPP435	BRP435/BPP435 LED70-4S/727	6053	45.0	134.8	0.665	0.039	0.029	0.029	0.021	86.6	64.4	64.4	46.6
99	BRP435/BPP435	BRP435/BPP435 LED80-4S/727	6890	51.0	134.3	0.76	0.039	0.029	0.029	0.021	86.6	64.4	64.4	46.6
100	BRP435/BPP435	BRP435/BPP435 LED90-4S/727	7720	58.0	132.6	0.862	0.039	0.029	0.029	0.021	86.6	64.4	64.4	46.6
101	BRP435/BPP435	BRP435/BPP435 LED100-4S/727	8525	65.0	130.8	0.966	0.04	0.03	0.03	0.022	88.8	66.6	66.6	48.9
102	BRP435/BPP435	BRP435/BPP435 LED110-4S/727	9300	72.0	128.8	1.07	0.041	0.031	0.031	0.023	91.1	68.8	68.8	51.1
103	BRP435/BPP435	BRP435/BPP435 LED120-4S/727	10051	79.0	126.7	1.175	0.041	0.031	0.031	0.023	91.1	68.8	68.8	51.1